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Christen M. Pearson

Grand Valley State University, pearsonc@gvsu.edu

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Cover Page Footnote

Christen M. Pearson is Professor of English Linguistics and TESOL at Grand Valley State University. Correspondence concerning this article should be addressed to Christen Pearson at this email address: pearsonc@gvsu.edu Acknowledgments The author wishes to gratefully acknowledge conference feedback from Boguslaw Gatarek, Andrew Domzalski, and Ewa Ostrowski regarding additional genetic and endocrine influences on language learning, as well as sex differences in general communication. Appreciation is also given to the anonymous reviewers who offered many helpful comments and to the editors who offered suggestions on improving readability and strengthening how the ideas were presented.

Real Boys Don't Do Language and Literacy—Or Do They?¹

Christen M. Pearson, Grand Valley State University

Introduction

Over the past several decades, there has been an increasing decline in boys' academic achievement, with gaps greater than 10% in some U.S. states (Cataldi, Laird, & KewalRamani, 2009; Chudowsky & Chudowsky, 2010), along with documentation of increasing struggles in language (both first and second) and literacy acquisition (Collins, Kenway, & McLeod, 2000), to the extent that “[c]ountries such as Canada, Australia, the United States and the United Kingdom are currently collectively reporting themselves as being in ‘crisis’ in relation to boys and schooling” (Carr & Pauwels, 2006, p.1). In looking at the literature on first language (L1) acquisition, it has been found that girls develop earlier in first words and verbal skills in general, with boys having more variability in developmental sequencing of various aspects of language, e.g., order of morphemes (Lange, Euler, & Zaretsky, 2016), as well as being on a later language trajectory in general (Barrett, 1995; Bates, Dale, & Thal, 1995; Bloom, 1993).² This difference then impacts achievement in literacy, with girls scoring higher than boys in measures of reading, writing, and spelling (Grigg, Daane, Jin, & Campbell, 2003; Mullis, Martin, Gonzalez, & Kennedy, 2003). Additionally, these differences persist through high school (Ely, 2005). In contrast, the literature on second language (L2) acquisition does not as of yet address different trajectories. Instead, the more commonly held view has been that boys are considered disadvantaged, problematic, and underachieving (Frank & Davison, 2007; Kenway, 1995; Lingard & Douglas, 1999), yet few researchers are interested in the “why” of boys' disinterest (Carr & Pauwels, 2006). This lag in exploring boys' L2 development may be an artifact of what has transpired historically in the L1, where in the 1970's through 2000, the focus was on girls and young women regarding gender-related concerns and learning (Sunderland, 2004; Swann, 1988), especially in countries such as Australia, New Zealand, and the UK. This focus involved both research and pedagogy, especially in the math and sciences (e.g., programs such as STEM in the U.S. with a focus on girls). Over the past 10-15 years, though, there has been a shift in interest to boys and their schooling (Carr & Pauwels; Lingard & Douglas, 1999). With increasing knowledge of differences between boys and girls in L1 development and literacy, research on L2 differences is likely to follow. This knowledge will ensure that all learners, male and female, will be taught in ways that optimize their learning.

Carr and Pauwels (2006), as two of the earlier researchers beginning this much needed conversation on the language learning needs of boys, specifically in the foreign language (FL) setting, note that “[t]he foreign language classroom turns out to be a particularly challenging site for boys in terms of identity constitution and performance” (p. 34). Echoing this view, Norton and Toohey (2004, as cited in Carr & Pauwels) state that the FL classroom is a “social space in which learners not only engage with new linguistic systems but are required to reconfigure their relationship to the social world” (p. 34).

A question that then arises is how much more of a challenge is learning and identity for boys in U.S. English as a Second Language (ESL) classrooms where learning in an L2 is not simply a foreign language class, but the entire school day – content, language, and their identity and relationships across cultures? Other questions follow: There is the expectation that findings for sex/gender differences hold for all of second language learning. But do they? And if so, do

they hold across all L2 contexts, both foreign language learning (FLL) and ESL?³ And how can this knowledge be applied to classrooms throughout the U.S.?

At this point, before exploring further, a semantic note on terminology is needed. Is the literature addressing gender or sex differences? According to Sax (2005), “Sex is a dichotomous biological variable. Humans are either female or male. . . Gender is a continuous variable. Gender is socially constructed. Humans can be mostly feminine, mostly masculine, or anything in between” (p. 252). Unfortunately, these terms are often used interchangeably. In this paper, after a few brief background comments on gender, the focus will be on sex differences.^{4,5}

Literature review

Two main perspectives

In order to address the discrepancy in learning between boys and girls, two main perspectives are currently prevalent. One is biological determinism, also termed essentialism, which involves genetically influenced sex differences, though this view does recognize social influence on what is already genetically determined. Emerging neurolinguistic research indicates support for this view (Gurian, 1996), with evidence of strong *biological (sex)* differences in brain structure and function that impact language and learning (Bonomo, 2010; Sax, 2005). A second view is that of social constructivism, where *gender* differences have been looked at through the lens of socially and culturally constructed identity (Kindlon & Thompson, 2000; Pollack, 1998). This latter view developed in reaction to empiricist accounts of learning in general in a similar vein as social interactionist accounts of language learning evolved from objections to empiricist accounts of how first languages (Bohannon & Bonvillian, 2005), as well as second languages (Brown, 2014), are learned.

These differing accounts are part of the long historical inquiry regarding the age-old dispute of nature (biology) vs. nurture (environment), the underlying cause of the “changing winds and shifting sands”, i.e., the cyclical patterns, seen in TESOL methods through the years (Marckwardt, 1972, p. 5, as cited in Brown, 2015). Based on work by Piaget, as well as Dewey, Bruner, Montessori, Rogers, Freire, and Vygotsky, among others, the constructivist viewpoint holds that the sociocultural perspective is critical in regards to all of learning. Learning occurs due to interaction between the person and his/her experiences with others; that is, learning is actively constructed in a social setting by interacting with those in it. This holds for language as well, with the two previously mentioned views in contention: Language as an innate mental system vs. language development evolving through social interactions and negotiated meaning within the environment (Roseberry-McKibbin, 2007).

If essentialism and constructivism are applied to learning in boys vs. girls, note that different terminology is used. Under the essentialist account, differences are framed using the term *sex*, as the focus is on biological differences internal to the learner. However, under a constructivist account, the framing is different, with the term *gender* used. This is because under a constructivist perspective, behavior is created, modified, even molded by societal (external) influences and has the potential to be fluid over time, as gender identity can also be fluid. (For example, see Coates, 2003, for an account using conversational analysis that explores the construction of male gender.)

Though many hold to one theoretical view or another, Kindlon and Thompson (2000) express a more neutral ground, arguing that “[t]he ‘nature or nurture’ debate sidesteps the genuine complexity of these issues” (p. 12), a position that may be more fruitful in the future in an attempt at a unified account of behavior. Brown (2015) reiterates a similar view, though

related specifically to language learning, that L2 acquisition is such a complex endeavor that *all* of the following need to be accounted for: cognition, emotion, physical movement, agency, and the sociocultural context. In relation to this more all-encompassing view, and referring to the semantic note by Sax (2005) in the previous section regarding definitions of the terms *sex* and *gender*, it could be said that two very different constructs may well be at issue in the essentialist vs. constructivist debate, both of which could uniquely offer insight into how boys and girls learn. In fact, as stated by Kindlon and Thompson (2000) in regards to sex/gender differences, “Rather than making it a contest between the two [biology vs. environment], current thinking in the neurosciences highlights the inextricable link between biology and experience, and it is now widely recognized that environmental factors can affect the structure of our brain” (p. 12). The perspective of a *link* between brain and environment, a melding of two prominent views, may be the most promising path when considering the complex nature of second language learning. That said, taking a constructivist view might be more useful for teachers (Gurian & Stevens, 2006), as it includes the possibility of a changeable environment, methods, and expectations, all of which are external to the learner and under more direct control by the teacher. However, teachers *first* need to question *why* these environmental changes work, so it is imperative to first explore neurological differences, the more innate, internal aspects within the learner. Though innate functioning cannot be changed, teachers *can* work to understand differences, and teachers *can then* modify the environment accordingly.

What is known about neurological sex differences in males and females?

As far back as the 1980s, intriguing differences in both brain structure and physiological activity have been found between male and female brains which are considered to be “hard-wired”, that is, innate (Gurian, 1996). These differences impact the processing of information, emotions, and gross motor skills⁶. It is important to note, though, that individual differences in configuration of components of the brain do exist. For example, 10% of girls are more “boy-like” in their learning style (a construct thought to be innate) while 20% of boys are more “girl-like” in learning style (Gurian).

Looking first at structural differences in the brain, it is known that boys tend to have larger brains, for their size, than girls; that boys have a *lower* proportion of grey matter – where information processing is done – than girls; and that boys have a *higher* proportion of white matter, which is involved in the transmission of electrical impulses from the brain to the body (Mulrine, 2002). It is also known that boys have a smaller corpus callosum – the bundle of nerves that connect the left and right hemispheres – and that this leads to more difficulty both in accurately identifying facial emotions⁷ and in verbal skills due to the less rich left brain connections, as well as less strong connections between the hemispheres in general (Gurian, 1996). However, this difference in the corpus callosum, which occurs during fetal development, also causes enriched connections within the right hemisphere of the brain in boys, the area with a focus on spatial relationships and activity (Gurian). In contrast, girls have a thicker corpus callosum which results in greater cross-talk between the right and left hemispheres, which, in turn, contributes to better reading skills (Gurian). Finally, boys have a larger inferior parietal lobe which leads to better spatial skills and math reasoning, whereas girls’ left brains develop earlier, corresponding to better language use, in both verbal and written domains (Bonomo, 2010). For example, language and fine motor skills can develop up to six years earlier in girls, while spatial memory can develop up to four years earlier in boys (Hamlon, Thatcher, & Cline, 1999).

Additional nervous system differences

Having briefly covered structural differences in the brain, nervous system differences that involve processing will be addressed. It is known that the autonomic nervous systems are very different in boys compared to girls and that this leads to differences in response to stressors and emotions (Sax, 2006). The female autonomic system is often more influenced by the parasympathetic nervous system – the “rest and digest” mode – while the male autonomic system is more influenced by the sympathetic nervous system – the “fight or flight” mode (Bonomo, 2010). Due to these differences, *on the surface*, boys may appear less methodical and less organized (Bonomo). Boys also tend to have more “on/off” brains that lead to more task-oriented behavior (but *not* multi-tasking) and greater reaction to interruptions of thinking which often leads to a sense of invasion (Gurian, 1996). Finally, boys frequently have shorter attention spans; however, they exhibit more active attention (Gurian).

Sensory-Perception-based differences

Not only has brain-based research found sex differences in brain structure and the nervous system, but differences in the sensory-perception systems as well. Research has found that boys, in general, are less sensory-oriented across the senses, including smell, taste, sound, and vision (Gurian, 1996). Of the senses, however, vision is their strongest. That said, their visual cortex is organized in a fundamentally different way and along a different developmental timetable, with girls, for example, acquiring binocular vision at a much earlier age than boys (Sax, 2006). These differences do not resolve, instead, becoming increasingly larger over time (Sax). Some of these differences can be seen in color preference and motion, with males preferring cool colors (silver, black, blue, and grey) and moving objects, even as infants before societal-mediated gender differences could develop (Bonomo, 2010). In contrast, females prefer textures and warm colors (red, yellow, and orange), more details, and faces, again, even as infants before the influence of societal assigned gender roles (Bonomo; Gurian & Stevens, 2006).

In addition to differences in the visual realm, there are differences in the auditory system. Boys hear less background noise which results in a reduced response to voices, often perceived by others as being ignored, though this is not true (Gurian, 1996; Sax, 2006). Boys also differentiate background noise to a lesser extent. In comparison, girls find noise ten times softer to be distracting; for example, even the quietness of a pencil tapping can be distracting to them (Sax, 2005). Girls also hear better, especially the higher frequencies critical for speech discrimination, a significant finding to seriously consider in relation to the impact on language learning (Bonomo, 2010). And, as with vision, these differences increase with age (Bonomo).

Differences in developmental timetables

In looking at how these structural, processing, and sensory differences play out developmentally, it is too simplistic to say boys develop more slowly; they develop *differently* (Sax, 2005). Too often, these differences are attributed to attention deficit/hyperactivity disorder (ADHD) or a cognitive deficit when, in reality, they are simply the results of differing structural and processing systems that have different developmental trajectories (Mulrine, 2002; Sax). For example, in the areas involved with visuospatial processing, specifically the sensorimotor cortex and occipital cortex, especially on the right side, boys often develop earlier than girls during the toddler and preschool years (King, Gurian, & Stevens, 2010; Sax). This

leads to earlier developing spatial and mechanical processing and the focus of many boys on building things (Mulrine; Sax). Boys are also often better at math at an earlier age, due to its abstract, spatial construct that draws on processing in the right hemisphere (Gurian, 1996). In contrast, though, many preschool and lower elementary-aged boys develop up to a year later than many girls of the same age in verbal and reading skills, due to these areas' reliance on strong left hemisphere processing (Baron-Cohen, 2003; Brizendine, 2010; Halpern, Benbow, Geary, Gur, Hyde, & Gernsbacher, 2007). Additionally, the frontal lobes of the brain, those that control social and cognitive functions, mature more slowly, the result being that boys are actually more emotionally fragile than girls (Gurian), contrary to popular thought. In contrast, the superior temporal cortex and frontal cortex develop earlier in girls (Sax) which lead to earlier interpretation of facial expressions and verbal processing abilities (Baron-Cohen, 2003; Halpern et al., 2007). In addition, there is earlier frontal lobe development in girls that increases their decision-making skills and reading/writing/word production at younger ages (Baron-Cohen, 2003; Brizendine, 2010; Halpern et al.). Finally, the prefrontal cortex – the area of executive function - is more active at an earlier age in girls compared to boys (Baron-Cohen; Brizendine; Halpern, et al.). This last area is especially relevant when considering what is required of children, often at very young ages, in the academic setting, such as sitting still for long periods of time, controlling behavior, keeping organized, and mastering the skillful visual tracking needed for reading.

Implications for Classrooms in General and Language Classes More Specifically

Having a rudimentary background in the structural and processing differences in the brains of boys and girls, it is now possible to begin to discuss implications for the classroom. One area that transcends all of the classroom experience is that of neural rest states. Boys' brains tend to more quickly go into rest states (a mode of less blood flow and neural activity) than do girls, especially if no “for survival” stimuli are present (King, Gurian, & Stevens, 2010). Because of this tendency, boys' rest states may appear on the surface as boredom or “zoning out” (King, Gurian, & Stevens). In order to avoid this easily activated rest state, boys tend to engage in activities such as tapping their pencils (a movement that increases boys' alertness, but that is heard as a distracting sound by girls' due to their greater auditory acuity) or by poking at classmates (again, a movement that generates a higher degree of alertness) (de Munck, Goncalves, Faes, Kutjer, Pouwels, Heethaar, & Lopes da Silva, 2008). These behaviors often result when boys are asked to perform in areas in which they are not yet developmentally ready (e.g., hearing, fine motor, language, and reading tasks). The result is that boys then “tune out and turn off” (Sax, 2005). Unfortunately, the negative feelings toward school that are then generated frequently persist for their entire academic career, often erroneously misinterpreted as a lack of motivation, laziness, and/or cognitive deficit (Burts, Hart, Charlesworth, Fleege, Mosley, & Thomasson, 1992; Stipek, Feiler, Byler, Ryan, Milburn, & Salmon, 1998; Valeski & Stipek, 2001).

It is when looking at the language class, especially for second language learners, that differences between boys and girls most readily become apparent due to the current pedagogical preference. In the shifting sands of TESOL approaches, grammar translation, audiolingualism, cognitive, and communicative approaches, among others, have cycled in and out of favor (Celce-Murcia, 2013). Currently, in the United States, there is a focus on the communicative approach (Savignon, 2013) where students are encouraged to discuss topics of interest and what they are feeling. Research suggests that girls are hard-wired to be stronger in classrooms that hold to this

approach, whereas boys have more difficulty. In girls, the brain activity associated with emotions moves from deep down in the amygdala to the cerebral cortex where verbal processing and speech also occur (Sax, 2005). In boys, however, brain activity associated with emotions stays in the amygdala, and the amygdala and cerebral cortex do not communicate well (Sax). Because of this, asking boys to talk about feelings makes it not only difficult and uncomfortable for them, but also requires more processing time. Though boys struggle more with the current focus on the communicative approach, they would have excelled in a different time period when the focus was the cognitive approach, e.g., with some aspects of the grammar-translation method. Boys are stronger in thinking in patterns and building things, including understanding symbolic systems, for example, as found in math and the sciences (Bonomo, 2010). Boys also tend to be stronger visual and logical learners, and, because of this, excel in learning more visual aspects of language, such as developing proficiency with the Chinese writing system; finding patterns within the Japanese writing system; and excelling in a language such as Latin where they can use a cognitive and analytical approach, tackling abstract concepts and rules with little need to communicate (Carr & Pauwels, 2006).

It is these types of differences in the language classroom that Carr and Pauwels (2006) set out to explore by interviewing teachers and students (of many first language backgrounds), at both the elementary and high school levels, across a range of English-speaking countries, including Australia, England, Wales, Scotland, and New Zealand. Though Carr and Pauwels began their study inclined towards a social constructivist view of gender, what emerged from their interviews was “the solidity of the *biological account* [emphasis added] of how boys/girls learn what they’re good at, what suits them, what is appropriate for them, and how to teach them” (p. 201-202) and support for the *innate predisposition account* where “overall nature wins hands-down over nurture” (p. 202). These findings were reinforced by *both* teacher and student reports in describing how students learn language, thus lending support for *sex* (vs. gender) differentiated cognitive systems. This finding in the field of the strength of a biological account of learning is in contrast with how teachers are trained, with many pre-service programs emphasizing a socially contrasted (constructivist) view of gender differences in learning (Carr & Pauwels), even while – perhaps unknowingly – putting an emphasis on differentiated learning and noting the importance of Gardner’s view of multiple intelligences, itself a biological model (Carr & Pauwels). This emphasis on a constructivist approach in pre-service training is in direct contrast with what in-service teachers in the field, based on their action research, see as differentiated physiological characteristics that more strongly align with biological/cognitive (essentialism) predispositions (Carr & Pauwels).

Argument

As findings similar to those of Carr and Pauwels (2006) emerge, educators and psychologists have begun to argue that while the educational system has successfully been changed to better meet the needs of girls’ learning styles (e.g., a greater focus on communication, discussion of feelings, noncompetitive group work, a “gentler” style of teaching), now it is time to modify the educational system to better meet the needs of boys’ learning styles rather than labeling boys as being defective (Gurian & Stevens, 2006). This view of difference, rather than deficit, is echoed by others in a quest for true equality among learners within the push for differentiated instruction (Clark, 1998; Gunzelmann & Connell, 2006; Lingard & Douglas, 1999; Sax, 2005; Smith & Wilhelm, 2002; Von Drehle, 2007). Bonomo (2010) has gone so far as to term the current educational system “biologically disrespectful” (p. 10) to boys. In the current

climate of differentiated instruction based on strengths and/or disabilities, this may not be too strong of a claim. Sex differences in learning and teaching are just another layer to address. In 1972, Title IX mandated gender equity in schools, and much progress has been made incorporating changes that have supported girls (Gunzelmann & Connell). Currently, there is a need in schools to support boys while continuing work to support girls. It should be noted that it was never said that “girls are flawed”; rather, the position was taken that the system was flawed, and it was changed (Gurian & Stevens). Now, over forty years later, it cannot be said strongly enough that boys are *not* flawed; they are simply different.

Questions That Need Addressing

If educators hold to a difference (vs. deficit) view, many questions arise. For example, should educators keep trying to change boys *or* should they work on changing the system? Gunzelmann and Connell (2006) argue that there is a need to change the curriculum to allow for developmental differences and that caution should be taken to ensure that boys not be made to feel inferior – with grades, reprimands, or medications – simply because they develop at different rates. Another critically important question to raise is this: If these proposed biological differences – structurally and in processing – are actually different between the sexes and are not addressed by the educational system, are educators dealing with *a pedagogical issue or a moral issue*? As educators grapple with these difficult questions, do they then focus on methods that are easiest to use or methods that optimize learning for each individual student? And finally, why are educators currently using pedagogical practices that are difficult for boys? Again, although innate mechanisms within students cannot be changed, educators *can* educate themselves to understand these differences and *can* modify their teaching styles and the environment to optimize these different learning mechanisms. The next section begins such a discussion.

So, how do we teach?

There are at least two pedagogical options that could be taken, the first of which would be single-sex classrooms. Though many might be opposed to this idea (a norm of an earlier time, before gender rights were at the forefront), it does have some merits. Gurian, Stevens, and Daniels (2009) note that in many instances both boys and girls are happier and enjoy school more, with parents noting that their children come home happier and more excited to discuss the school day. Here in Michigan, same-sex classrooms have been tried by Dave Curtis (5th grade teacher) at Kenowa Hills Public Schools, in the Grand Rapids area, with positive results (Gurian, Stevens, & Daniels). Other states have also trialed same-sex schools. For example, in Atlanta, Georgia, two same-sex middle schools were piloted beginning in 2007: *Business Engineering Science Technology Academy for Boys* and *Coretta Scott King Young Women’s Leadership Academy*. By investing time and resources to train all faculty and staff in the different learning mechanisms of boys and girls, as well as strategic implementation of more gender-friendly teaching strategies, both schools have been so successful that this model will be extended through the senior high level (King, Gurian, & Stevens, 2010). Although schools piloting such programs are experiencing success, many changes and financial resources are needed, along with community support, to move to single-sex classrooms. A second option, then, would be to modify current classroom and teaching practices. What follows are numerous ideas to support boys of all ages within the current school systems. Ideas for specific sensory areas will be presented first, followed by specific academic skills, including a section on the ESL learner.

Ideas to address visual differences

- Use less eye contact as boys are more easily distracted; let them keep their eyes on their work (Gurian, 1996).
- While girls prefer to talk face-to-face, boys prefer a should-to-shoulder approach. Sit next to boys with both looking at materials in front (Sax, 2005).
- Keep the classroom less stimulating visually (walls, ceiling); too much stimulation and motion can be distracting for boys (Gurian, 1996).
- In contrast, use visuals for actual lessons and for work to be done, keeping in mind that boys tend to be graphic thinkers; focus on spatial relationships, puzzle-solving, and analytical deconstruction (King, Gurian, & Stevens, 2010).

Ideas to address auditory differences

- Keep in mind that boys may be more distracted and simply not hear, so be aware of ambient noise in the classroom; do not jump to the conclusion that a child has ADHD (Sax, 2005).
- Speak louder (though with girls close by, one would want to be careful not to raise one's voice too much, as this could easily be perceived as yelling) (Sax, 2005).
- To address these potential problems, seat boys closer to the front of the room or where the teacher usually stands to teach (Bonomo, 2010).
- Determine which ear is better in an individual learner and direct speech to that side.
- Support auditory input with visual cues, boys' strongest sense, to the left eye (which is controlled by the right hemisphere that deals with spatial relationships), thus maximizing on an area of strength.

Ideas to support active and kinesthetic learners

Interestingly enough, many of the practices discussed in the literature to support boys' learning in this area are the same as those found in the literature on teaching content to L2 learners (e.g., see Herrell & Jordan, 2016, for an abundance of strategies).

- Challenge, but don't overwhelm (Carr & Pauwels, 2006); consider Vygotsky's Zone of Proximal Development while carefully structuring work to ensure it is no more than one step beyond what students can do on their own.
- Use more interactive classroom dynamics, including physical activity both during and between lessons (Carr & Pauwels, 2006; King, Gurian, & Stevens, 2010).
- Incorporate more active learning opportunities that include visual-spatial and kinesthetic skills, e.g., act out punctuation marks, stretch, do yoga, and/or use manipulatives (Carr & Pauwels, 2006; Gurian, 1996; Gunzelmann & Connell, 2006).
- Use a problem-solving approach, with real-world problems; move quickly to this approach incorporating shorter teaching sessions, then move to problem-solving with attention to: a safely structured environment, a patient resource person, and plenty of time allowed due to the longer processing time boys (and second language learners) need (Carr & Pauwels, 2006; Gurian, 1996).
- Use a project-based approach that includes incremental skill building; incorporate a series of small tasks, contextualized into a "mission" that not only helps others, but also helps the students (Gurian, 1996).

- Allow genuine interaction – with noise – and authentic tasks using the students’ interests and experiences (e.g., cooking, rap music); additionally, projects should be structured so that true collaboration is required in order to complete the project (Mulrine, 2002).
- Turn learning into a game as boys thrive on competition. Caution: Separate the least confident boys from those who are most critical of others in order to eliminate, as much as possible, the potential for public shaming (Carr & Pauwels, 2006). Encourage doing over communicating with a focus on team/group competition, not individual competition, e.g., *group* math contests, spelling bees, geography bees, and cyber-hunts (Gunzelmann & Connell, 2006).
- In group learning approaches, use larger groups with plenty of space and time for additional processing needs; for some, this may include individual work that has an important group role. Encourage a sense of belonging to a team in comparison to groups for girls where smaller numbers work best (Gurian, 1996).
- In groups as well as individually, allow choices and some autonomy in the selection of tasks (Carr & Pauwels, 2006; King, Gurian, & Stevens, 2010).

Ideas involving language

- To circumvent boys’ reticence in speaking and sharing feelings, use role-playing, allowing boys to become someone else or to use a new identity in the language classroom (Smith & Wilhelm, 2002); use puppets (Carr & Pauwels, 2006) with students speaking through them (displacement) and/or allow boys to discuss themselves through movies and mythology (Gurian, 1996).
- Use a code-cracking approach to language learning, including grammar (Smith & Wilhelm, 2002).
- Be clear with expectations; model language to help boys with the words needed to explain their thinking (Brand, 2006).
- Be patient and let boys take the time they need to process questions and respond (Mulrine, 2002); let them take the lead and then help them set goals (Brand, 2006).
- Talk while walking (movement is less threatening) with eyes looking forward (Mulrine, 2002).
- Do not demand verbalization when boys are upset (also do not demand eye contact) (Mulrine, 2002).
- Focus on *using* language over learning *about* language (Carr & Pauwels, 2006).

Ideas involving reading

- Select more select more action-based materials (Carr & Pauwels, 2006), for example: nonfiction with descriptions of events and how things work; action literature with life as a battle to overcome in some way; literature with strong male characters doing unpredictable things and/or taking dramatic action to change their world (e.g., Twain and Hemingway for older ages) (Sax, 2005).
- Incorporate non-traditional reading material, e.g., high quality newspapers that are factual, motivating (sports, editorials), and involve the real world, as well as magazines that tap into their interests (e.g., *Sports Illustrated*) (King, Gurian, & Stevens, 2010).
- Check out <http://www.guysread.com> for many, many ideas across ages and genres – a wonderful resource and site (Gunzelmann & Connell, 2006).

Across the curriculum

- Keep in mind the crucial importance of sequencing material so that what follows builds on the previous, helping students to make connections and develop mastery incrementally (Smith & Wilhelm, 2002).
- Use sensible sequencing that will lead to a sense of control and competence, provide appropriate challenges with clear goals and feedback, and focus on the immediate (Smith & Wilhelm, 2002).
- Use the strategy of learn → apply, learn → apply, etc., in a carefully constructed step-by-step fashion (Smith & Wilhelm, 2002).
- Craft assessments which cannot be perceived as threatening, especially regarding communication; allow boys to *demonstrate* their learning nonverbally if possible (Gunzelmann & Connell, 2006), similar to what is done by TESOL practitioners working with English language learners, especially those at lower proficiency levels.
- Stress the importance of community (classroom), service (task-based/service-based learning), and kinship (group work) (Gurian, 1996).

Addressing the environment

- Speak louder around boys using short, direct sentences; move around the room to keep their attention; and seat them towards the front of the classroom (Sax, 2005).
- Decrease competing visual and auditory stimuli (Gurian, 1996; Sax, 2005).
- Keep the temperature at approximately 69-71 degrees Fahrenheit for boys and 75-77 degrees Fahrenheit for girls (Bonomo, 2010; Sax, 2006). This important point is more difficult in mixed sex classrooms; however, try to keep it in mind if there are warmer and cooler sections of the room.

The classroom with culturally and linguistically diverse (CLD) students

As noted above, many of the suggestions in the literature regarding how to support boys in the academic setting also reflect current thinking on how to support CLD students. TESOL practitioners may want to consider how the following ideas might be implemented in their own classrooms. Note that many of the following ideas involve the use of visuals, one of the stronger senses in boys, as well as movement (kinesthesia), an area of need especially in younger boys. As has been stated above, many of the techniques used by TESOL practitioners as “best practice” or part of a principled approach to language teaching are ideally suited to the needs of many boys.

To support language development:

- Use realia; for example, instead of verbally describing a bicycle or musical instrument, bring in the actual object for students to explore (Echevarria, Vogt, & Short, 2013), which would support both visual learning and the need for movement.
- Use gestures and body language (Egbert & Ernst-Slavit, 2010) as these have a stronger impact on the visual field.
- Spell or pronounce syllables to the tune of B-I-N-G-O or other known tune while clapping (Egbert & Ernst-Slavit), which is both visual and kinesthetic.
- Make a visual pictograph of a process as it is being described (vs. simply pointing to something already drawn) while using observation sheets by the students in order to keep the focus on visual input (Egbert & Ernst-Slavit).

- Use color-coded cards when focusing on language forms, e.g., base word forms in one color and bound morphemes (e.g., past tense, progressive, plural marker) in different colors. This idea encourages focus on the visual elements of a word while also encouraging physical manipulation (movement) of word parts.
- Visually manipulate grammar concepts through “syntax surgery”, using sentence strips that can be manipulated for practice with form or to contrast with L1 word order (Herrell & Jordan, 2016; includes ideas for Pre-K through Grade 12).
- Have students use a “magic wand” (movement) to identify transformations of a word across classes (e.g., noun becoming a verb, verb becoming an adjective) given a set of sentences or when discussing cognates of two languages in a reading passage (Vogt, Echevarria, & Washam, 2015).
- Use selective features of Total Physical Response (TPR), which incorporates both visual elements and movement, for example use of invented gestures for new vocabulary/concepts (Vogt, Echevarria, & Washam).
- Use semantic maps, word expert cards, semantic feature analysis charts, and Venn diagrams when teaching vocabulary (Akhavan, 2006).
- Use scavenger hunts of various types (e.g., specific words, categories of words, science concepts – solids, liquids, gasses), all encouraging friendly competition in groups and movement around the classroom or school property (Vogt, Echevarria, & Washam).
- Use visual concept ladders to synthesize learned information and scaffold high level critical thinking skills, starting with “what” and progressing to “why” (Vogt, Echevarria, & Washam).
- Incorporate a pictorial “Facebook” in the classroom where students can post new words describing a recent activity (book, film, party) on their visual profile “page” upon which others students can then make comments (Vogt, Echevarria, & Washam).

To support reading in the earlier years:

- Select topics of interest to boys in the class, while also making sure selected material is culturally relevant and activates background knowledge (Echevarria, Vogt, & Short, 2014).
- Carefully scaffold learners by using pre-reading strategies that help boys to connect to their own lives in an authentic fashion, using visuals for critical terms/concepts, and build additional background knowledge through use of films and field trips (Egbert & Ernst-Slavit, 2010).
- Include graphic organizers, KWL charts, and charts/tables/figures to visually support reading (Egbert & Ernst-Slavit).
- Consider including Reader’s Theater that incorporates movement and visuals (Egbert & Ernst-Slavit).
- Incorporate flow charts and story mapping, using visual representations of the setting, sequence of events, and actions of characters; further, emotions of characters can be drawn with no need to verbalize them (Egbert & Ernst-Slavit).

To support reading at the intermediate and middle/high school levels:

- Draw visual pyramids to differentiate main points vs. details (Egbert & Ernst-Slavit, 2010).

- Use cognitive mapping, graphics that show connections (e.g., Venn diagrams), cause and effect, and inferences (Egbert & Ernst-Slavit).
- Incorporate learning logs and response journals in assignments, both with student responses in pictorial form (Egbert & Ernst-Slavit).
- Have students generate their own PowerPoint slide shows (Vogt, Echevarria, & Washam, 2015).
- Incorporate projects that require students to engage with a great deal of pictorial content, in addition to prose, resulting in a finalized project which can be shared, for example: 1) a pictorial timeline that explores immigration, including what it is, how it affects lives, reasons for migration, Ellis Island in the U.S., and their own family history (Akhavan, 2006); and 2) cultural studies utilizing research skills and concepts of valuing home cultures (see Herrell and Jordan, 2016, for a description of incorporating visuals, movement, interaction, connection to the known, and authenticity within a full range of age levels, kindergarten through high school).

To support writing skills (first five ideas from Egbert and Ernst-Slavit, 2010; many additional ideas can be found in Gibbons, 2015):

- Select topics that boys in the classroom are interested in and that are culturally relevant, linking topics to boys' personal lives.
- Encourage boys to physically act out their brainstormed ideas for a story.
- Select and organize ideas using pictorial graphic organizers.
- Allow boys to draw pictures with one-word labels during the early stages, then move from words to sentences with weekly goals that are realistic.
- Move from drawing pictures to tell a story to telling a written story with illustrations, a sequence that will start with their visual strength and, with careful scaffolding, move to their weaker verbal area. This can also be done with computer work: using pictures and graphics with isolated words and moving to prose with graphics illustrating what has been written.
- Make sure to incorporate authentic purposes for writing, for example: books to take home, books to read to younger students/siblings, stories as gifts for family members, stories for drama presentations performed for other classes or the entire school, articles for the class or school newspaper, and letters to the editor on an important issue for the local newspaper (older learners)

Across the curriculum and general environment:

- Seat boys toward the front of the class where the teacher's voice will be louder.
- Configure room so that front of the class is away from the hallway and doors with distracting noise.
- Situate front of the classroom where the room is coolest in temperature.
- Reserve visuals for what class is currently working on in preference to visual "clutter" that is distracting (such as mobiles covering the ceiling, posters of topics for the entire year).
- Use learning centers in different parts of the room so that it is acceptable to rotate and move around throughout the day.
- Use lots of manipulables.

- Consider chairs that move (bounce in place), as safe places to fidget and move, yet remain in seat.
- Assign boys to be helpers with jobs to do that involve appropriate movement, e.g., passing out supplies, collecting work, and such.
- Use games such as BINGO to teach vocabulary for various content areas, incorporating synonyms, antonyms, definitions, and such (Egbert & Ernst-Slavit, 2010)
- Encourage movement with physical timelines using students' bodies and signs, rather than only written timelines, to capture chronological events in history, literature, and such (Egbert & Ernst-Slavit).
- Use “graffiti”, a visual representation of main ideas in a lecture, in order for students to create a summary using images and key words (Vogt, Echevarria, & Washam, 2015).
- Incorporate the use of “stop lights” to help students indicate their level of understanding. These could be taped to student desks with students putting a token on the appropriate colored light as the teacher moves around the room and the students work. Alternatively, they could be used by students on review sheets or on tests to indicate their perceived level of understanding (Tattershall, 2002).
- Finally, increase use of technology across content areas, while incorporating visuals and movement with older learners, by having students create digital stories, make PowerPoint presentations, and become involved in podcasting and/or create public video presentations to highlight their scholarly work (Rohan, 2011). These types of projects increase social interaction and provide an authentic audience.

Characteristics of good teachers – and what they need

Having explored many ideas for how content-area teachers and TESOL practitioners can support boys in their classrooms, it is important to consider what teachers need. Carr and Pauwels (2006) also addressed this point, noting that “what happens between teachers, students and curriculum is always as much to do with relationships as it is to do with pedagogy” (p. 113). In their interviews, from the perspective of what L2 students need, Carr and Pauwels determined that teachers should have the following: A solid knowledge of grammar, using it as a tool rather than an ideology; an affinity for students' interests; a personality that likes students, treats them equitably, and caters willingly to individual student needs while also considering the common good; a willingness to build relationships; a teaching style that is interesting, fun, and fair, yet also is able to establish clear boundaries and rules; and finally, perhaps most important, the ability to ensure that each of their students *perceives* that they are liked, are considered interesting, and are enjoyable to work with. From the teachers' perspectives, Carr and Pauwels found that teachers need *support* that includes time to teach well and reflectively, financial resources for access to further education and needed materials, and the ability to make and implement changes in their teaching, as well as support more generally from principals and administrators at both school and district levels. Additionally, teachers need *colleagues* who are willing to develop richer tasks that connect language to other areas across the curriculum.

Closing remarks and questions

If, based on the above findings, the argument is made that teachers need to take into account sex differences in learning, support along the lines of time and resources will be crucial, as it will take many hours to reflect on current practice, consider possible modifications, and then

implement those changes, with further refinement on an on-going basis. It has been a long process to do this for girls; now, the task – and challenge – is to do so for boys.

This task and challenge leads to several important questions that all must reflect on and answer, based on their individual situations. First, what are we, as TESOL practitioners, doing right already as we seek to optimally teach both girls and boys? Second, what can we do to modify our teaching and the learning environment – now – to improve further on teaching both boys and girls? And third, what can we do long-term to advocate for better teaching environments and methods for both girls and boys? On the surface, these questions look easy; however, in actual practice, they can be daunting. It has taken several decades to learn and implement the changes needed to support girls. Our boys deserve no less. In the words of Sax (2005), we need to “cherish and celebrate the innate differences between the sexes while at the same time enabling equal opportunities for every child” (p. 51). As we step forward for this challenge, it will also be important to remember that equal does not necessarily mean the same. Equal means giving each child what he or she needs in order to optimally learn.

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Footnotes

¹ The title of this paper was extended from Carr and Pauwels' (2006) subtitle to their book on boys and foreign language learning.

² For a fuller state-of-the-art overview of sex differences in L1 acquisition, see the online preprint of Lange, Euler, and Zaretsky (2016).

³ An interesting note is that sex differences do not seem to appear in all L2 groups (Pearson, 2015). This begs the question of why: Could it be that underlying differences are masked by other variables? For example, Pearson (2005, 2010) looked at an array of medical and psychosocial variables and their impact on learning basic interpersonal communication skills (BICS), both comprehension and production, as well as cognitive academic language proficiency (CALP), again, both comprehension and production. Though variables such as low birth weight, chronic illness, hearing loss, trauma/neglect/abuse, and personality did influence the ease or difficulty in learning BICS and CALP, the variable of sex did not. Why might this be so? Do these differences only hold for acquiring a first language? Or does the critical period (or "sensitive" or "optimal" period) have something to do with it? After all, the children in this study were age three years and older at time of exposure to English in the adoptive home, with an average age of six and a half years. It is important to remember that the critical period hypothesis does not state that one cannot learn another language after a critical period, only that the learning mechanisms might be different, for example, drawing upon the more general cognitive skills needed for reading. If the critical period interacts with sex differences, at least in this unique population of second language learner, then it argues for a younger age than the traditional mark of puberty, as Paradis (1999) has already discussed. Beyond the critical period, another question one might ask would be whether sound L2 teaching practices and a certain length of time in exemplary educational settings could override biological sex differences in this particular population of children. In addition, other questions loom, bridging the sex/gender distinction: Since fewer boys are available for adoption from cultures where the males are more often kept in the family in order to carry on the family name, do those that are placed for adoption perceive themselves differently, is their identify more fluid, less tied to cultural constraints, thus making it easier to take on a new identity in the new culture (and hence, become more active language learners, compared to the findings of Carr and Pauwels (2006)? Alternatively, do TESOL methods vs. foreign language learning methods differ enough to override sex differences, at least in this unique population of second language learner? These questions will take a considerable amount of time to explore and will be dependent on further research into the neurological underpinnings of language and sex differences. For now, they offer teachers of such children interesting questions for speculation and observation in their own classrooms.

⁴ This paper focuses on biological sex differences in the research data, as gender identification and degree of gender construction, especially cross-culturally, is not known. This is not to say that gender differences and societal impact on gender construction is not relevant. It is, in fact, a debate in the literature. Indeed, the unique population of internationally adopted children, especially those adopted at an older age who have experienced cross-cultural influences on

gender, would be an interesting demographic for study. However, within the constraints of length, this article focuses on biological sex differences.

⁵ It is important to note that future research may indicate that the variable of sex is much more complex than simply female or male.

⁶ For an accessible introduction to neurolinguistics for the educated lay reader, see *Chapter 4 Neurolinguistics* in Owens (2005).

⁷ It is interesting to compare this difference in recognizing facial emotions with Specific Language Impairment (SLI) and also Asperger's Syndrome, both of which can include difficulty with recognition of emotions in facial expressions, and both of which have a greater incidence in boys. Over seven percent of the general population has SLI (Leonard, 1998; Tomblin, 1996) with twice as many boys affected (Law, Boyle, Harris, Harkness, & Nye, 2000). Figures for Autism Spectrum Disorder (ASD), in which Asperger's Syndrome is often included, are one in 68 children in the U.S. (Baio, 2014), with the incidence in boys being five times more prevalent (1 in 42) compared with girls (1 in 189) (Baio, 2014). As of yet, research into a link between SLI and ASD has not found a gene linking the two (Newbury et al., 2002), though the mapping of characteristics of these syndromes, along with sex differences, may provide interesting areas for further exploration in the future.