

# Cognitive assessment of refugee children: Effects of trauma and new language acquisition

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## Abstract

Each year, approximately 60,000 children of refugee background are resettled in Western countries. This paper reviews the effects of the refugee experience on cognitive functioning. The distinctive influences for these children include exposure to traumatic events and the need to acquire a new language, factors that need to be considered to avoid overdiagnosis of learning disorders and inappropriate educational placements. Prearrival trauma, psychological sequelae of traumatic events, developmental impact of trauma, and the quality of family functioning have been found to influence cognitive functioning, learning, and academic performance. In addition, the refugee child may be semiproficient in several languages, but proficient in none, whilst also trying to learn a new language. The influence that the child's limited English proficiency, literacy, and school experience may have on academic and test performance is demonstrated by drawing on the research on refugees' English language acquisition, as well as the more extensive literature on bilingual English language learners. Implications for interventions

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are drawn at the level of government policy, schools, and the individual. The paper concludes with the observation that there is a major need for longitudinal research on refugee children's learning and academic performance and on interventions that will close the academic gap, thereby enabling refugee children to reach their educational potential.

**Keywords**

academic performance, assessment, attachment, cognitive functioning, language acquisition, refugee children, trauma

The effects of refugee experiences on children's mental health are well-researched (Henley & Robinson, 2011), however, we could identify no publications that address the effects of these experiences on the cognitive functioning and performance of refugee children. Understanding these effects is important because these children are amongst those overrepresented in special education settings (Mehmedbegović, 2012; Paradis, 2010). This paper therefore examines a number of influences on cognitive functioning that arise from the recognition that refugee children are exposed to traumatic events, experience disruptions to family relationships, and almost always need to acquire a new language in the country of settlement.

Children below the age of 18 years comprised 50% of the world's 10.7 million refugees in 2013 (United Nations High Commissioner for Refugees [UNHCR], 2014). While the majority of the world's refugees live in countries of first asylum, the focus here is on refugees who have been forcibly displaced from their homes, and who have moved from a country where they sought protection, to be resettled in another country that has agreed to accept them as refugees. Resettlement countries provide the relative security of permanent residency and opportunity for eventual citizenship (UNHCR, 2011).

The English-speaking countries of Australia, Canada, New Zealand, the United States (US), and the United Kingdom (UK) are among the world's top 10 resettlement countries. Between 2003 and 2012 these countries resettled over 784,000 refugees, more than 93% of the total number resettled globally (Refugee Council of Australia [RCA], 2013). Internationally, over the last 15 years, the top 10 source countries for resettled refugees were Myanmar (Burma), Iraq, Somalia, Bhutan, Sudan, Afghanistan, Iran, Democratic Republic of the Congo, Liberia, and Ethiopia (RCA, 2013).

The national origins of people who are resettled change over time, reflecting changing zones of conflict in the world. In the late 1990s nearly 50% of the resettlement program came from Europe, 30% from the Middle East, and 16% from Africa. By 2003, the order was reversed, with no more than 5% each from Europe and the Middle East, while 63% came from Africa, with one third

originating in Sudan, the single most frequent country of origin. In 2012, the pattern changed again: the proportion originating in Africa declined to 24%, the proportion from the Middle East increased fourfold to 20%, while Asia became the largest region of origin for resettled refugees (56%), almost half of whom (24%) originated from Burma, the leading source country (RCA, 2014).

As refugee source countries are predominantly non-English speaking, refugee children are among the increasing number of English language learners (ELLs) attending schools in English-speaking countries (Brown, Miller, & Mitchell, 2006; Mallows, 2012; McBrien, 2005). Refugee children are also among the ELLs who are disproportionately being referred for cognitive assessment of a possible learning disorder, and who (as noted above) are overrepresented in special education settings (Mehmedbegović, 2012; Nykiel-Herbert, 2010; Paradis, 2010).

In general, children and young people of refugee background will have experienced a wide range of traumatic events prior to their arrival in a settlement country. These may have included coming under combat fire and bombing; destruction of home and schools; separation from and disappearance of parents, family members, and friends; witnessing violence and death; prolonged danger; and perilous journeys. Some will have experienced forced conscription, arrest, detention, sexual assault, and torture. Traumatic events are rarely isolated and are associated with separation from and loss of family members, poverty, and lack of health care and education (Amnesty International, 2002; UNHCR, 2008).

Much can be gleaned regarding the traumatic experiences that children and families are likely to have suffered from an examination of the nature of conflict, persecution, and war which has characterised life in the aforementioned regions. Children whose family country of origin is Burma, for example, are likely to have spent their whole lives displaced from their homes. Typically they have lived in refugee camps for long periods of time or lived in constant danger. Those from Iraq come from a war-torn region where there is no distinction between children and adults when it comes to victims of bombings. Children are also targeted for kidnapping and extortion (UNHCR, 2008).

With human rights violations, civil conflicts, and war continuing over years and decades in some regions of the world, exposure to related traumatic events can continue once people have arrived in a country of settlement. Close family members in their countries of origin or countries of transit can remain in danger of persecution, actual and threatened violence, and forced displacement (Harris & Marlowe, 2011; Kaplan, 2013).

This paper aims to increase understanding of the way that these experiences can cause cognitive difficulties in refugee children. More specifically, we examine the evidence for the effects that prearrival loss and trauma, family functioning, and learning a new language can have on cognitive functioning and performance.

## Method

This paper draws on multidisciplinary studies relevant to understanding aspects of refugee experience as factors influencing cognitive functioning and performance. Medline, PsycINFO, Academic Search Complete, and CINAHL databases were searched from 1980 to 2014 for peer-reviewed, English-language publications relating to refugee and asylum-seeking children, cognitive functioning and assessment, trauma, neglect, attachment, family functioning, settlement stressors, language acquisition, English proficiency, English language learners, and learning disorders. Searches for grey literature were conducted on the Internet, and reference lists of identified studies provided additional papers. As relevant literature on refugee children was limited, we drew on broader related studies. The paper is not designed to provide an exhaustive review of the literature.

## Results

### *The psychological and cognitive sequelae of traumatic events*

Experience of traumatic events, including violence, abuse, or neglect (Cook, Blaustein, Spinazzola, & van der Kolk, 2003; De Bellis, Hooper, Spratt, & Woolley, 2009), can cause cognitive, emotional, and behavioural changes that affect learning, academic performance, and performance on intelligence tests (Pechtel & Pizzagalli, 2011; Pinson, Arnot, & Candappa, 2010; Wilson, Hansen, & Li, 2011). Evidence has shown an association between childhood experiences of traumatic events and impaired memory, attention, executive skills, and abstract reasoning (Beers & De Bellis, 2002; Pynoos, Steinberg, & Wraith, 1995; Toth & Cicchetti, 1998). Similar impairments in these functions have been found in neglected children, who have shown poorer language and learning skills than non-neglected children (De Bellis et al., 2009).

No research was identified that has investigated these relationships with refugee children, but they would be expected to apply to any child. There is some suggestion that the relationship between traumatic events and cognitive functioning is particularly marked for children with posttraumatic stress disorder (PTSD) symptoms (Saigh, Oberfield, Halamandaris, Yasik, & Bremner, 2006; Yasik, Saigh, Oberfield, & Halamandaris, 2007).

PTSD occurs frequently amongst traumatised children (Ehnholt, Smith, & Yule, 2005) and refugee children (Davidson, Murray, & Schweitzer, 2008; Ehnholt & Yule, 2006). Depression and anxiety disorders have also been found to be elevated amongst refugee children (De Haene, Grietens, & Verschueren, 2007; National Child Traumatic Stress Network [NCTSN], 2003). Bronstein and Montgomery's (2011) comprehensive review of studies published between 2003 and 2008 of refugee children living in Western settlement countries aimed to avoid some of the reported methodological differences that confounded findings of earlier reviews (Henley & Robinson, 2011). Prevalence rates of anxiety ranged

from 33 to 50%, depression from 3 to 30%, and PTSD from 19 to 54%, whereas PTSD prevalence in the general child population ranges from 2 to 9% (Bronstein & Montgomery, 2011). Elevated rates of PTSD have been shown to persist up to 12 years after resettlement (Henley & Robinson, 2011).

Several of the symptoms of PTSD, anxiety, and depressive disorders could interfere directly or indirectly with learning (Beers & De Bellis, 2002; Eth & Pynoos, 1985; Rousseau, Drapeau, & Corin, 1996). For example, poor concentration, one of the symptom criteria of PTSD, anxiety, and depression (American Psychiatric Association, 2013), could have direct adverse effects on both the acquisition of new information and cognitive skills, and performance (Streeck-Fischer & van der Kolk, 2000). Intrusive memories of traumatic events may cause the child to be distracted from a learning task and to develop a style of forgetting that dispels the traumatic memories but also inhibits spontaneous thought (Eth & Pynoos, 1985). As one second grade girl lamented, "I hear everything at school, and then it's just gone. What happened to my mommy comes right back to me" (Eth & Pynoos, 1985, p. 44).

A number of other mechanisms could also link symptomatic reactions to traumatic events to cognitive functioning. Symptoms such as hypervigilance, dissociation, altered states of consciousness, and amnesia may adversely affect executive functioning, understanding instructions, working memory (including retention of instructions when problem solving), committing knowledge to long-term memory, category formation, shifting between abstract and concrete thinking, generating problem-solving strategies, and demonstrating a solution to others (Massachusetts Advocates for Children, 2005; Toth & Cicchetti, 1998).

PTSD, depression, and anxiety may also indirectly affect cognitive achievement by interfering with the range of nonintellective factors important to learning and cognitive performance. These factors include creative play, anticipation of success or failure, the capacity for both emotional and behavioural self-regulation, reflection, ability to profit from adult guidance, motivation, and self-confidence (Elliott, 2000; Tzuriel, 2000).

As most of the evidence cited is correlational in nature, it is difficult to be conclusive about the causal pathways between trauma and cognitive function. It is possible that limited cognitive skills are a predisposing factor in the development of PTSD (Hildyard & Wolfe, 2002; Wilson et al., 2011). Furthermore, with the exception of a few studies (Cicchetti & Toth, 2005; Masten & Narayan, 2012), the role of mediating factors, such as a child's way of coping with traumatic events, is usually not considered.

### *Impact of trauma on early childhood development*

Research into early abuse, neglect, and other traumatic experiences, has found associations between neurobiological, cognitive, and emotional development and subsequent impairment in cognitive and academic functioning. The extent of developmental consequences is influenced by the child's age, the duration of traumatic

experiences, and the presence of protective factors (Andersen et al., 2008; Beckett et al., 2006; Masten & Narayan, 2012; Pechtel & Pizzagalli, 2011).

The age at which abuse or neglect occurs, and its duration, were found to influence the cognitive functioning of Romanian children who were placed in orphanages when approximately 1 month old, in severely deprived conditions, with little opportunity to develop attachment relationships (Beckett et al., 2006; Chisholm, Carter, Ames, & Morison, 1995). For children adopted after 6 months of age by UK adoptive parents, cognitive performance at ages 4, 6, and 11 was negatively associated with length of time spent in the orphanage (Beckett et al., 2006; O'Connor, 2000). This group's cognitive performance was significantly poorer than that of orphans adopted before 6 months of age, whose cognitive performance proved to be comparable to that of UK-born adoptees (Beckett et al., 2006; O'Connor, 2000).

There are different ways to understand the link between the traumatic experiences and cognitive functioning. One mechanism is the consequence of disrupted attachment on emotion regulation. In the absence of a nurturing caregiver, the child may become unbearably distressed, anxious, and angry, potentially triggering dissociation and fragmentation of emotion and cognition, with little expectation of being understood or comforted, and a poor sense of inner agency (Cook et al., 2003; Streeck-Fischer & van der Kolk, 2000). Extreme emotions can result in overstimulation and physiological arousal. Unable to regulate their emotions, insecurely attached children may be unable to cognitively process incoming information because they have not learned to integrate emotion and cognition, setting the stage for future maladaptive approaches to information processing (Cicchetti, 2008; Streeck-Fischer & van der Kolk, 2000). Lacking a sense of security, normal levels of curiosity may not develop, which can contribute to learning difficulties (Streeck-Fischer & van der Kolk, 2000).

In neurobiological terms, early experiences of childhood adversity have been associated with hypothalamic-pituitary-adrenal axis dysfunction (Cicchetti, 2008; Wilson et al., 2011), which may impair development of the limbic region of the brain, the prefrontal and parietal lobes, the corpus callosum, and the brain stem (Andersen et al., 2008; Chugani et al., 2001; Hart & Rubia, 2012; Whittle et al., 2013). Dysfunction in these areas of the brain may contribute to difficulties in the development of emotion regulation, attention, concentration and impulse control, learning, verbal declarative memory, visual memory, language acquisition, and visuospatial functioning (Hart & Rubia, 2012; M. Rutter et al., 2007; Wilson et al., 2011). Evidence from children who were sexually abused at different ages suggests that regions of the brain may be differentially affected (Pechtel & Pizzagalli, 2011). Impairment in hippocampal development was evident for girls abused between ages 3 and 5 and 11 and 13 years, in corpus callosum development for abuse between ages 9 and 10 years, and in frontal cortex development in girls abused between 14 and 16 years (Andersen et al., 2008).

The research on neglected Romanian orphans and sexually abused children reviewed in this section may not readily generalise to the kinds of traumatic

experiences found among refugee children. However, given that no similar research has been conducted with refugee children, this work does suggest potential pathways to be considered in future studies with refugee children.

Indeed, refugee children may be at particular risk of disrupted attachment due to various aspects of the refugee experience (Montgomery, 2011). Parents who themselves are traumatised may become unresponsive to their children's trauma, adversely influencing attachment (Almqvist & Broberg, 2003; De Haene, Grietens, & Verschueren, 2010; Henley & Robinson, 2011; Masten & Narayan, 2012). Children who have witnessed harm to a parent may be overwhelmed by the parent's fear and inability to protect themselves and the child (Almqvist & Broberg, 2003; Reed, Fazel, Jones, Panter-Brick, & Stein, 2012). Some refugee children may lose their primary caregiver when very young with no alternative caregivers available (Fonagy, 1999; Kinzie, Boehnlein, & Sack, 1998). Of school-aged refugee children and youth resettled in Greece, the UK, and the US, between 28% and 60% had a parent who had been killed, or were presently separated from a parent for 1 month or more (Heptinstall, Sethna, & Taylor, 2004; Kia-Keating & Ellis, 2007; Papageorgiou et al., 2000). The prolonged nature of conflict and oppression in refugee source countries, the dangerous flight journeys, and conditions in refugee camps may all contribute to a severely disrupted child-caregiver relationship (Victorian Foundation for the Survivors of Torture [VFST], 2005).

### *Family functioning*

The quality of family functioning, in addition to early attachment, affects mental health and cognitive development (Evans, 2004; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD], 2005). A stimulating and safe family environment, with minimal stress, anxiety, and fear (Bradley & Corwyn, 2002; Lupien, King, Meaney, & McEwen, 2000), fosters factors that are central to cognitive functioning, including creative play, adult guidance and mediation of learning, development of motivation, frustration tolerance, and self-confidence (Elliott, 2000; National Scientific Council on the Developing Child [NSCDC], 2004, 2005, 2010; Streeck-Fischer & van der Kolk, 2000). Conversely, family stressors can lead to anxiety, depression and time away from school (Heptinstall et al., 2004; McBrien, 2005; Puig, 2002).

Some children may receive little emotional support from parents who are struggling with settlement issues such as unemployment, underemployment, and poverty; insecure housing; and in some cases, racist and xenophobic behaviour (Beiser, 2009; Papadopoulos, Lees, Lay, & Gebrehiwot, 2004; Paxton, Smith, Win, Mulholland, & Hood, 2011). Refugee families may have limited social support networks because of the small size and fragmentation of refugee communities (Westermeyer, 1986).

Children themselves may directly experience the stressors of poverty, racism, and adjusting to a new environment and culture, conditions that can be unfavourable to full participation in schooling and study (Anderson, 2004;



Pinson et al., 2010; J. Rutter, 2001). However, no studies were located that show a direct relationship between psychosocial stressors and learning, cognitive performance, or academic performance in refugee children. Many of the psychosocial stressors commonly experienced by refugees, such as socioeconomic disadvantages, are also experienced by large proportions of host society populations and it has been well-documented that children experiencing chronic poverty are more likely to have lower cognitive performance (Bradley & Corwyn, 2002; Evans, 2004; NICHD, 2005). Other stressors experienced disproportionately but not exclusively by refugees include social isolation and exclusion, legal issues, neighbourhood disadvantage, and physical health problems, and there is considerable evidence of the relationship between psychosocial stressors and mental health in refugee populations (Montgomery, 2011; Porter & Haslam, 2005).

Refugee parents may experience mental disorders (Davidson, Murray, & Schweitzer, 2010; Reed et al., 2012), affecting the quality of nurturance and learning environment in the home (Montgomery, 2011). Although the mechanisms for influence are not explicated, parental mental health and responsiveness to the child has been found to be associated with cognitive functioning and educational achievement (Bradley & Corwyn, 2002; Evans, 2004; NSCDC, 2004, 2009).

An important consideration is the extent to which a refugee family is intact. Family members may be grieving for lost loved ones, or experiencing protracted anxiety regarding the whereabouts and safety of missing family members who were split up when fleeing. Family members often remain in precarious settings in the homeland or surrounding regions (McBrien, 2005; Papageorgiou et al., 2000). Many young people are unaccompanied minors—those under 18 years of age who arrive without either parent—and are known to be particularly vulnerable (Montgomery, 2011; Vervliet et al., 2014). For those children who do arrive with one or both parents, their parents may be preoccupied with worries, under strain to send remittances, and struggling with lack of family reunion visas or delays in their processing (Davidson et al., 2008; Harris & Marlowe, 2011). Ongoing grief for separated family members can be profound and is often underestimated as a cause of emotional and learning difficulties for children (Heptinstall et al., 2004; Kaplan, 2013).

As a result of changes in family relationships and loss of status (Rousseau, Rufagari, Bagilishya, & Measham, 2004), children may experience pressure for high academic achievement, but miss school due to caretaking responsibilities and their parents' dependence on them (Candappa, 2000; McBrien, 2005; J. Rutter, 2001). Intergenerational conflict often occurs due to the relatively faster acculturation rates of children compared to older generations (Kia-Keating & Ellis, 2007) and loss of parenting status (Henley & Robinson, 2011; McBrien, 2005). Children typically acquire the host country conversational language faster, and this can contribute to "parentification," with children taking on responsibilities beyond their years such as imparting knowledge to their parents (Puig, 2002; Rousseau et al., 2004).



Taken together, the stressors on refugee children, many of which are related to family functioning, are considerable. The extent to which they cumulatively affect learning is underresearched. For any child in a testing situation, anxiety about stressors in general, and specific worries such as doing well to please parents, can affect performance and potentially lead to underestimates of ability or capacity.

### *Language acquisition and cognitive performance*

In addition to the effects of trauma on cognitive development and performance, another major consideration is the language, or languages in which the refugee child is proficient. This section draws on the limited research on refugees' English language acquisition, as well as the extensive literature on bilingual English language learners (ELLs), to highlight the influence of the refugee child's linguistic experiences on academic and test performance.

It has been reported that newly arrived refugee children (or other ELLs) who speak little or no English are overrepresented in special education services, having performed poorly on standardised cognitive assessment instruments (Kaplan, 2009; Pena, Gillam, Bedore, & Bohman, 2011). Referral for a cognitive assessment may be made to rule out a language-based learning disorder when the child fails to make academic progress comparable to age-equivalent peers, despite showing increasing proficiency in spoken English (McBrien, 2005). While various terms are used for language-based learning disorders (Kohnert, Windsor, & Ebert, 2009), the frequently used term specific language impairment (SLI) is adopted hereafter, and refers to delays in language development not attributable to impaired hearing, motor functioning, nonverbal performance, or neurological damage (Paradis, 2010). As further discussed below, it is important to be aware that the English required for academic tasks, including literature, science, mathematics, and social studies, takes much longer to acquire than conversational (or oral) language proficiency (Cummins, 1980; Hakuta, Butler, & Witt, 2000). Consequently, cognitive testing in English may seriously underestimate language and academic competence (Cummins, 1981).

When conducting an assessment and before administering any tests it is important to establish: the number of languages the child has learnt to speak and how proficiently, their level of literacy and previous experience of schooling, their age on arrival in the host country, and whether an interpreter is available for the assessment. Failure to incorporate these factors into psychological reports has been associated with failure to differentiate early stages of English language acquisition from an SLI (Figueroa & Newsome, 2006; Paradis, 2010).

*Evaluating proficiency in all languages.* Refugee children may have acquired a number of languages (designated as primary languages [PLs]), but achieved full proficiency in none, if they have spent time in several transit countries during the refugee journey (Blommaert, 2009; Izon & Kelly, 2007; Miller, 2009). Consequently, "refugee students may find themselves unable to communicate well in [any language]"

(McBrien, 2005, p. 343). To determine the dominant (or most proficient) language in which cognitive assessment should be conducted, ideally proficiency in all languages would be assessed, as proficiency scores on any one language test may underestimate “total language ability” (Kohnert, 2010; Rivera-Mindt et al., 2008).

Total language ability refers to findings that ELLs’ vocabulary and semantic knowledge tends to be distributed rather than duplicated across languages; for example some words may be known in one language but not the other (Kohnert et al., 2009). Consequently vocabulary in any one language may appear to be limited, but total vocabulary may be larger than that of monolinguals (Kohnert, 2010; Oller, Pearson, & Cobo-Lewis, 2007). Circumstances of use and amount of experience in each language appear to influence respective levels of vocabulary, so that children may show uneven performance and differing patterns of language dominance on different language tasks and in different domains (e.g., at home vs. at school; American Educational Research Association [AERA], American Psychological Association, & National Council on Measurement in Education, 1999; Oller et al., 2007; Solano-Flores, 2008). These differing patterns indicate the importance of a comprehensive assessment of all language skills as ELLs who are unable to demonstrate language skills in one language may be able to do so in another language (Kohnert, 2010; Pena et al., 2011). Low English proficiency need not equate with poor academic knowledge (Halle, Hair, Wandner, McNamara, & Chien, 2011).

The Bilingual Verbal Ability Test (BVAT; Munoz-Sandoval, Cummins, Alvarado, & Ruef, 2005) has been recommended for testing proficiency in two languages (Blatchley & Lau, 2010; Searight & Searight, 2009), but also demonstrates a useful principle for assessment of proficiency in multiple languages. The BVAT, a measure of bilinguals’ overall verbal ability, is first administered in English, missed items are administered in the child’s PL, and a composite score is calculated (Munoz-Sandoval et al., 2005). The test assesses receptive language, expressive language, and verbal reasoning and is available in 17 languages (Munoz-Sandoval et al., 2005). In principle, therefore, the child could be asked to answer questions in more than one PL. If the BVAT is not available in the child’s PL, the same approach could be used with an interpreter who speaks the child’s PL.

When establishing language dominance it is useful to consider the distinction between oral or conversational proficiency and academic language proficiency (Cummins, 1980, 1981, 2008). As previously noted, judgements regarding English proficiency based on oral language proficiency are likely to overestimate the academic language proficiency required for learning school-based subject matter, as this takes 5 to 10 years to acquire, while basic to advanced oral language proficiency takes 2 to 5 years (Cummins, 1980, 1981; Hakuta et al., 2000; Thomas & Collier, 2002). Another consideration is the amount of education the child has received in a PL. ELLs who arrived between the ages of 8 and 12 years took 5 to 7 years to achieve academic language proficiency, but younger ELLs with little or no PL schooling took up to 10 years (Hakuta et al., 2000; Thomas & Collier, 2002). ELLs who arrived after age 12 (with 6 or more years of PL schooling) made

good progress in acquiring academic language proficiency with each succeeding year but ran out of time to catch up with native English-speaking peers (Thomas & Collier, 1997). This research indicates the principle that the more education a child has in the PL, the better the ultimate academic performance, as PL skills and academic knowledge typically transfer to the new language (Cummins, 1980, 1981; Thomas & Collier, 2002). If refugee children and youth have had little or no schooling in PLs, they may lack the academic knowledge for transfer to English (Miller, 2009).

The language for administration of tests needs to be chosen with care. Children's self-ratings may be the best guide to language proficiency and dominance as bilinguals' self-reports have shown significant associations with proficiency measures and interviews (Gollan, Weissberger, Runnqvist, Montoya, & Cera, 2012). It is advisable to determine whether the child's self-ratings relate to oral or academic language proficiency and whether they coincide with the language skills and domains that are of interest to the examiner (Cummins, 1980; Gollan et al., 2012). Because some ELLs perceive stigma to be associated with their PLs they may nominate English as their dominant language even when it is not (McBrien, 2005; Mucherah, 2008); alternatively, if proficiency has not been achieved in any PL, English proficiency may be greatest because it is used most frequently (Bedore et al., 2012; Izon & Kelly, 2007).

Results from measures of English-language proficiency may be available from the child's school. For example, various measures have been developed for ELLs by U.S. states (Albers, Kenyon, & Boals, 2009; Solano-Flores, 2008), following the introduction of the No Child Left Behind Act (2003). The Act requires U.S. states to assess ELLs' English-language proficiency and academic performance annually and to demonstrate adequate progress (Abedi, 2004). Federal civil rights law requires schools to identify and assist ELLs to overcome language barriers to meaningful participation in learning (Albers et al., 2009). The websites of the U.S. State of New Jersey Department of Education (2010) and the Canadian state of Alberta (Alberta Education, 2012a, 2012b) list a number of recommended English language proficiency tests.

Debate exists regarding appropriate methods of validating and norming English-language proficiency tests, as measures vary markedly in the language tasks assessed and in criteria for achievement of proficiency levels (Albers et al., 2009; Wolf, Farnsworth, & Herman, 2008). With the exception of Spanish (Bedore et al., 2012), validated and norm-referenced proficiency tests of PLs are unlikely to be available in the languages of newly arrived refugees (Pitoniak et al., 2009), which in Australia, the UK, and the US include languages such as Hazaragi, Nepali, Farsi, Karen, Tamil, Somali, Chaldean, Armenian, and Assyrian (Department of Immigration and Citizenship, 2013; Refugee Council, 2014; Refugee Processing Centre, 2014).

Given the various limitations of language proficiency tests, qualitative methods may be needed to assess English and PL proficiency, aided by fluent bilingual staff, or qualified interpreters (Rivera-Mindt et al., 2008; see discussion of dynamic

assessment and assessment with an interpreter below). Teachers' observations of the child's English proficiency in various school settings and tasks can be useful (Fraine & McDade, 2009; Kohnert, 2010). Strengths and weaknesses in English and in PLs can be identified through various developmentally appropriate language tasks that sample speaking, listening, reading, and writing (Alberta Education, 2012b; Rivera-Mindt et al., 2008).

Having established the dominant language, the practitioner needs to decide whether to conduct the cognitive assessment in English, a PL, or both if the child is not clearly proficient in any language (Bedore et al., 2012; Rivera-Mindt et al., 2008).

*School experience and literacy.* Literacy and educational experience are central to understanding and performing cognitive assessment tasks (Ardila et al., 2010; Lohman & Gambrell, 2011). Achievement of literacy is likely to depend on whether the child has previously attended school, and the quality of that schooling. Refugees may have had interrupted schooling or been prevented from attending schools because of ongoing war and conflict (Blommaert, 2009; Brown et al., 2006); they may come from a predominantly oral culture without a written language (Burgoyne & Hull, 2007), or from oppressed minority groups whose culture and language have been suppressed (Nykiel-Herbert, 2010; Roy & Roxas, 2011). Previous experiences of school may have been of classes conducted on dirt floors, or under a tree, with no desks, chairs, or learning materials, student teacher ratios of 100:1 or greater, and untrained teachers, often little older than their students (International Rescue Committee, 2006). Some children will have attended classes in refugee camps, receiving minimal and intermittent education, possibly in different languages (Brown et al., 2006; VFST, 2005).

From a cognitive assessment perspective, poor quality schooling has been shown to detrimentally influence WAIS-III test performance, including not only Vocabulary, but also Block Design, Digit Symbol, Digit Span and Matrix Reasoning (Ostrosky-Solis & Lozano, 2006; Shuttleworth-Edwards et al., 2004). However, children with limited or poor quality schooling perform better on memory and other cognitive tasks than those with no schooling at all (Ardila et al., 2010; Nell, 2000). Illiterate children showed significantly poorer neuropsychological test performance than children with 2 to 3 years of education (Ardila et al., 2010). Formal education provides not only new knowledge, but "formal modes of discursive verbal and logical thinking divorced from immediate practical experience" (Ardila et al., 2010, p. 698).

Available evidence on poor quality schooling shows that immigrant ELLs who had experienced interrupted schooling in their home country showed an increasing gap in academic performance for each year of lost schooling, compared to native English-speaking classmates (Thomas & Collier, 2002).

Illiteracy has a major impact on cognitive test performance, particularly on tests with a significant language component (Ardila et al., 2010; Ostrosky-Solis & Lozano, 2006). In the process of learning to read and write, fundamental skills

are developed such as learning to decode and interpret symbols on a page (Alberta Education, 2012b; Koda, 2007). Advanced skills including “verbal and visual memory, phonological awareness, executive functioning, and visuospatial and visuomotor skills” (Ardila et al., 2010, p. 692) are also developed. These skills may influence performance on both verbal and nonverbal tests (Alberta Education, 2012b; Koda, 2007).

Nonverbal tests may be recommended for illiterate ELLs, but these tests, too, have cultural and language loadings: pictorial representations may be unfamiliar and are often culturally loaded (Malda et al., 2008; Rosselli & Ardila, 2003), and test instructions communicated through gestures may be misunderstood (Lohman & Gambrell, 2011). So-called nonverbal tests still involve verbal processing, as shown by strong correlations between WAIS-III Verbal IQ and Matrix Reasoning tests, and may be better conceived of as requiring a process of abstract reasoning that is difficult to verbalise (Dugbartey et al., 1999).

Adding to the disadvantages of illiteracy, refugee children with little or no experience of formal schooling may be unfamiliar with testing procedures, as cognitive instruments test skills learned in school (Ardila et al., 2010; Nell, 2000). Test-wiseness requires classroom skills and behaviours such as the use of pens, familiarity with letters and numbers, and the need to pay attention and follow instructions (Ardila et al., 2010; Brown et al., 2006; Nell, 2000). Timed tests may be unfamiliar, contributing to anxiety even for children with some schooling, while fear of authority may further impair performance (Nell, 2000; Pitoniak et al., 2009).

Literate refugee children may have learnt their PL in a written form that is orthographically (or structurally) dissimilar to the Roman script of the English language, resulting in language distance (Koda, 2007; Wong & Pyun, 2012). Language distance may contribute to test bias: children educated in Arabic had greater difficulty in a Raven-like inductive reasoning test than students in Austria, because the test required identification of rules from left to right, whereas Arabic script is read from right to left (van de Vijver & Leung, 2011).

Lack of educational stimulation and resources in the home such as books and newspapers may adversely affect academic and test performance (Evans, 2004; Malda et al., 2008; Nell, 2000). Parents who may wish to encourage their children’s education may be unable to help with homework because they are not literate in English (Walker-Dalhouse & Dalhouse, 2009). Lower parental literacy and education have been associated with poorer English language scores and academic achievement by ELLs (Hakuta et al., 2000; Thomas & Collier, 2002). However, preschool ELL children of parents who provided language stimulation showed greater language competence regardless of socioeconomic status (Halle et al., 2011).

*Differentiating English language learning from specific language impairment (SLI).* It is difficult to identify SLI in ELLs, as ELLs in the first 2 years of English-language learning have shown overlap in grammatical and syntactical errors on standardised

tests developed for monolingual children with SLIs (Kohnert, 2010; Paradis, 2010). Only after 3 years of learning English did typical ELLs' scores on a test of grammatical impairment exceed scores of monolinguals with SLI (Paradis, 2010). ELLs with SLIs can be differentiated from typically developing ELLs as the former tend to show deficits in both languages, with difficulties in phonological awareness, grammar, and working memory; languages are learnt more slowly, and less complex sentences with fewer words are used in narrative tasks (August & Shanahan, 2006; Bedore & Pena, 2008; Kohnert, 2010). ELLs with SLI also tend to show poorer performance on nonlinguistic tasks including perceptual motor processing and symbolic processing, which may invoke different cognitive skills (Kohnert et al., 2009).

To determine whether an ELL has a capacity to learn, and to differentiate ELLs with SLI, Kohnert (2010) recommends the test–teach–retest approach of dynamic assessment (DA). After testing, the child is provided with examiner feedback about response accuracy or task principles; changes in performance are evaluated after retest using parallel items (Gutierrez-Clellen & Pena, 2001). This is consistent with Nell's (2000) use of test practice and WAIS reversal items to familiarise test-naïve clients with test materials. A performance standard for DA tasks may be obtained by first testing one or two typically developing ELL siblings or peers (Kohnert, 2010).

DA methods have shown that performance changes differentiated bilingual children with and without SLIs (Hasson, Camilleri, Jones, Smith, & Dodd, 2012). Cognitive interviews, in which the child is asked to “think aloud” and explain their answers may help to determine whether the task was understood (Malda et al., 2008). If no one language is dominant, DA could be conducted in more than one language to ensure that total cognitive capacity is tapped (Kohnert, 2010; Oller et al., 2007). To rule out an SLI, speech pathologists experienced in the assessment of bilingual or multilingual children may be consulted, in partnership with an interpreter (Kohnert, 2010).

*Cognitive assessment with an interpreter.* When translated, validated, and normed cognitive tests are not available in the child's PL, opinion is divided on whether assessment should be conducted with an interpreter. Concurrent test translation by an interpreter during the assessment has been strongly discouraged by some authors because of potential interpreter error (Casas et al., 2012; Searight & Searight, 2009); bilingual psychologists or psychometrists are recommended instead (Rivera-Mindt et al., 2008). However, the proficiency, qualifications, and cognitive testing experience of bilingual staff can vary widely and should be verified (Solano-Flores, 2008).

Because of limited availability of bilingual psychologists, and of translated and culturally validated tests in all possible languages (Searight & Searight, 2009), cognitive tests will sometimes need to be administered with an interpreter as a native language accommodation (AERA et al., 1999; Rivera-Mindt et al., 2008). Results from a test that is oral, or sight translated by an interpreter are no longer



standardised, and scores should be interpreted in the context of a comprehensive assessment that seeks corroborative evidence (Figueroa & Newsome, 2006; Rivera-Mindt et al., 2008). Useful guidelines on conducting assessments with interpreters are provided by Miletic et al. (2006); Rousseau, Measham, and Moro (2011); and Tribe and Thomson (2008).

*Inclusion of language context in the case report.* To avoid misdiagnosis the report should indicate how the interpretation of test results was influenced by contextual information such as the child's proficiency and literacy in which languages, the amount and quality of previous schooling, the language(s) in which tests were administered, whether tests were administered by a bilingual psychologist or with a qualified interpreter, and whether norms were available for a child of this background. A comprehensive assessment would include informant reports and observational data (Figueroa & Newsome, 2006; Pitoniak et al., 2009; Rivera-Mindt et al., 2008). By taking into account the full complexity of linguistic factors and by looking for converging lines of evidence, valid conclusions can be reached regarding a refugee child's cognitive functioning. This in turn points to appropriate interventions that will assist the child to obtain an education that maximises her/his potential.

### *Interventions to improve cognitive development and academic performance*

Trauma and impaired attachment do not uniformly influence neurobiological, cognitive, and psychological functioning in all affected children, and may be reversible to some extent, given timely psychosocial interventions (Cicchetti, 2008). This is shown by longitudinal studies of the development of the Romanian orphans adopted in Western countries (Beckett et al., 2006; Chisholm et al., 1995; Chugani et al., 2001; Morison & Ames, 1995; O'Connor, 2000; M. Rutter et al., 2007), discussed above. Deficits in the "intellectually impaired" range, reported at adoption by Canadian and UK adoptive parents, improved 1 year after adoption, with delayed functioning in all areas reducing from 78% to 32% (Chugani et al., 2001; Morison & Ames, 1995; M. Rutter et al., 2007). Demonstrating the benefits of early intervention and a responsive home environment, UK-Romanian orphans adopted before 6 months of age achieved cognitive and academic performance comparable to UK-born adoptees by age 11 (Beckett et al., 2006; O'Connor, 2000; M. Rutter et al., 2007). Whether such findings apply to children experiencing less disruption to attachment relationships or trauma is unknown. There is also very little research evaluating the effects of various education programs on refugee students' academic progress and achievement, with studies tending to focus on children's trauma and psychological functioning, or students' and teachers' educational challenges, but neglecting educational outcomes (Taylor & Sidhu, 2011). Approaches to education of refugee students in culturally diverse countries such as Australia, Canada, and the UK can be piecemeal (Taylor & Sidhu, 2011), although there have been efforts to develop overarching policies and strategies



(Block, Cross, Riggs, & Gibbs, 2014). Potential ways to foster major gains range from modifying the language of tuition, bridging programs, whole-of-school approaches, and trauma-focused interventions.

Research shows that ELLs who are able to continue learning academic content in their PL before gradually moving to English-language classes eventually outperform their monolingual peers (Rolstad, Mahoney, & Glass, 2005; Thomas & Collier, 2002). However, refugee children, may not be fully proficient in any PL, nor have been previously educated in a PL. Moreover, the bilingual education strategy tends to require sufficiently large groups of the same language background (e.g., Latino children in the U.S.) to justify the resources required, which may be impracticable in highly culturally diverse communities, such as those found in Australia (Clifford, Rhodes, & Paxton, 2014). Nevertheless, English-only programs tend to disadvantage ELLs as the need to learn English and academic content simultaneously results in an ever-increasing academic gap (Hakuta et al., 2000; Thomas & Collier, 2002). U.S. and Canadian research has shown that of ELLs and refugee students who attended English-immersion classes only and had experienced prearrival interrupted schooling, up to 60% dropped out, failing to graduate from secondary school (Thomas & Collier, 2002; Toohey & Derwing, 2008).

The potential for interventions to improve cognitive functioning for refugee children is also supported by the broader literature. For example preschool interventions implemented in families in low-income countries may be useful for newly arrived refugee families who do not have books available in PLs and have limited English literacy (McBrien, 2011; Walker-Dalhouse & Dalhouse, 2009). Preschool children showed improved parent-child interactions, psychomotor development, vocabulary, and cognitive development when parents were taught to understand childhood development and to play with, read to, and verbally communicate with their child (Maulik & Darmstadt, 2009). Culturally acceptable methods such as storytelling may also foster language development (Raikes et al., 2006).

At a different level of intervention, a whole-of-school focus involving students, families, communities, teachers, support staff, local agencies, and principals, is recommended to foster inclusion, celebrate diversity, achieve equitable education, and identify learning difficulties for refugee students (Block et al., 2014; Fraine & McDade, 2009; Taylor & Sidhu, 2011). To bridge the gap between schools and refugee families, a U.S. refugee agency employed culture brokers, who were resettled refugees of similar cultural background to the families that they liaised with; after 12 months parents became more involved, communicating significantly more often with schools (McBrien, 2011). However none of these studies evaluated effects on student learning.

A range of interventions that target emotional functioning, symptom constellations such as PTSD, and family functioning (Henley & Robinson, 2011) would be expected to improve cognitive functioning and performance through the pathways

suggested earlier. However, studies that demonstrate emotional benefits do not demonstrate cognitive benefits, simply because cognitive functioning was not included amongst outcome measures. As noted by Wilson et al (2011), “there is an imperative need for research on the effects of the traumatic stress response on the cognitive development, development of information processing, and neuropsychological functioning of children” (p. 93), and more specifically, research is needed into interventions designed to improve cognitive functioning.

*Formulating an intervention for the individual child.* A range of factors need to be considered when interpreting a child’s cognitive performance and formulating the most appropriate intervention, where needed. In addition to those discussed above, one of those factors is health problems that may interfere with learning. As a result of life in refugee camps and perilous flights, refugee children are at high risk of injuries, infections, and nutritional deficiency that require medical attention (Shah, Siddharth, & Yun, 2014; Sheikh et al., 2009). Due to malnutrition, vitamin B12 levels, which are important for neurological functioning (Centers for Disease Control and Prevention [CDCP], 2012; Paxton et al., 2011), have been found to be deficient in refugees from Bhutan, Iran, and Afghanistan (Benson et al., 2013). High levels of vitamin D deficiency, as well as malaria, tuberculosis, and a range of other nutritional deficiencies, and infectious diseases, have been found in African and Karen refugee children (Paxton, Sangster, Maxwell, McBride, & Drewe, 2012; Sheikh et al., 2009).

A developmental history is particularly important in view of a child’s refugee experiences (CDCP, 2012). This should include timing of major milestones; the history of availability of food, shelter, and health services; and particularly any history of major organ or system disorders or diseases such as epilepsy, cerebral malaria, and injuries, especially head injuries (John et al., 2008; Weinstein, Fucetola, & Mollica, 2001). A refugee child may well have missed out on auditory and visual function screening due to their age at arrival (CDCP, 2012; NSW Refugee Health Service, 2009). It is just as important not to miss a disorder requiring special needs education or other rehabilitation as it is to avoid overdiagnosing such disorders.

Finally, the appropriate use of testing may aid assessment and the formulation of suitable interventions. As discussed, the limitations of applying standardised tests are considerable due to refugee children’s frequent lack of experience with tests, cultural loadings of tests, and the absence of norms for refugee children (Fraire & McDade, 2009; Nell, 2000). Nevertheless, when commonly used tests are adapted and qualitative features of test performance are observed (Gutierrez-Clellen & Pena, 2001; Malda et al., 2008), the resulting information can allow the range of cognitive functioning to be estimated. To prevent inappropriate placements affecting a child’s future, assessments should be repeated within 2 years or earlier, if conclusions from the initial assessment conflict with subsequent evidence from the classroom, home, or elsewhere.

## Conclusion

A considerable amount of refugee-specific and broader research has shown links between the cognitive functioning of children and exposure to traumatic events, family functioning, and English-language learning. As argued, some of the mechanisms underlying these influences are complex. The potential exists for reducing the cognitive and academic gap for refugee children in English-speaking settlement countries through a range of interventions at the government policy, school, family, and individual levels. However, research is required into the extent to which cognitive difficulties can be remediated with targeted strategies.

In the interim, a comprehensive approach to the cognitive assessment of refugee children would minimise the risks of both misdiagnosis and the formulation of inappropriate interventions. It is important for practitioners to investigate and integrate contextual information into their assessment and psychological reports, drawing together converging lines of evidence, including that of other informants and professionals from other disciplines. Without the needed research, a primary concern is enabling children to fulfil their rights to education to achieve their developmental potential. This is a fundamental right expressed in the UN Convention on the Rights of the Child (UN Office of the High Commissioner for Human Rights, 1989).

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