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Language diversity, language disorder, and fetal alcohol spectrum disorder among youth sentenced to detention in Western Australia

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ABSTRACT

Background: While studies confirm high prevalence of language disorder among justice-involved young people, little is known about the impact of Fetal Alcohol Spectrum Disorder (FASD) on language among this population. It is also not clear how language skills vary according to language diversity in Australian youth justice settings, where a disproportionate number of justice-involved youth are Aboriginal and may not speak Standard Australian English (SAE) as their first language. Language skills are important to understand, as language disorder and language difference can lead to a mismatch between the communication skills of a young person and the communication skills of the justice workforce with whom they are communicating. In the highly verbal environments that are common to justice systems, language disorder and language difference may result in a young person misunderstanding legal information and expectations placed on them and not being adequately understood by the justice workforce.

Methods: This study examined the language skills of 98 young people sentenced to detention in Western Australia (WA), who participated in a cross-sectional study examining the prevalence of FASD. Language skills assessed using standardised and non-standardised tasks were analysed by the three major language groups identified: speakers of SAE, Aboriginal English and English as an additional language.

Results: We identified rich diversity of languages, and multilingualism was common. Most young people for whom English was not their first language demonstrated difficulties in SAE competence. Further, nearly one in two young people were identified with language disorder – over half of whom had language disorder associated with FASD.

Conclusions: This study has documented language diversity and the prevalence of language disorder associated with FASD among a representative sample of youth sentenced to detention in WA. Results underscore the need for the justice workforce to consider language difference when working with justice-involved youth, as well as language disorder and FASD. The findings also demonstrate the need for speech pathology to be embedded as core service in youth justice systems, working in collaboration with local cultural and language advisors and accredited interpreters. This can better enable appropriate identification of and response to communication and associated rehabilitation needs of young people navigating youth justice systems.

Abbreviations: FASD, Fetal alcohol spectrum disorder; WA, Western Australia; CELF-4, Clinical Evaluation of Language Fundamentals 4th Edition

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1. Introduction

1.1. Language and youth justice

Language skills are integral to communication; they are key to cultivating relationships, shaping identity, nurturing confidence, engaging with social, educational and vocational endeavours, and advocating for needs (Coles, Gillett, Murray, & Turner, 2017; Martin, 2018). Language is also central to social and cultural determinants of health for Aboriginal people, as language skills enable storytelling and passing on of knowledge and history, which is vital for the sustainability and practice of culture (Commonwealth of Australia, 2012; Department of Health, 2017). While speech refers to the physical production or articulation of sounds, language includes vocabulary, grammar, morphology and pragmatics (the social function of language), and allows people to understand what is said (receptive language), and to express their thoughts, needs and desires (expressive language) (Leitão, 2015). Language skills also enable internal dialogue, 'self-talk', which supports metalinguistic skills such as reflective and critical thinking (Salmon, O'Kearney, Reese, & Fortune, 2016). In contrast, language disorder, which refers to significant, persistent and quantifiable comprehension and/or expression difficulties, that are not attributed to speaking a different language, can increase risk of cultural isolation, social, emotional and behavioural problems, academic difficulties and premature school disengagement (American Psychiatric Association, 2013; Commonwealth of Australia, 2012; Durkin, Toseeb, Botting, Pickles, & Conti-Ramsden, 2017; Ripley & Yuill, 2005; Snowling, Bishop, Stothard, Chipchase, & Kaplan, 2006). Associations between language disorder and offending behaviour have been identified (Brownlie et al., 2004; Hopkins, Clegg, & Stackhouse, 2017), and offenders with more frequent and severe crimes are more likely to have language disorder than offenders with less frequent and severe crimes (Snow & Powell, 2011).

In youth justice settings, language disorder affects 50 to 60% of young people, independent of cognitive impairment (Anderson, Hawes, & Snow, 2016). Compared to the general youth population, this prevalence is much higher. For example, in Australia, it is estimated that 13% of five- to eighteen-year-old children have language disorder (McLeod & McKinnon, 2007). While externalising problems including behavioural and academic difficulties are often noted among justice-involved youth, language skills – also important for self-regulation, social competence, and the transition to literacy – are often not considered, or responded to (Snow, Powell, & Sanger, 2012). In the justice system, language disorder can leave youth vulnerable in their navigation of complex and highly verbal processes, and facing numerous obstacles for their rehabilitation (Snow et al., 2012). When encountering police and participating in forensic interviews and court proceedings, communication skills are under heavy demand. They include the ability to understand instruction, recall and sequence events, perceive and convey varying points of view, and repair misunderstandings (Snow et al., 2012). However, many justice-involved youth have difficulties with the communication skills needed for these interactions. For example, in England, when compared to non-justice involved youth, justice-involved youth express themselves with, and understand, fewer words (Hopkins et al., 2017), and in Australia, justice-involved youth are more likely than non-justice involved youth to omit key details when telling a story (Snow & Powell, 2008). Inconsistent and non-cohesive accounts may result, which may be perceived as poor compliance (Snow & Powell, 2008). As legal interviews revolve around storytelling, language disorder can undermine successful participation in legal contexts (Snow & Powell, 2008).

1.2. Fetal alcohol spectrum disorder (FASD) and youth justice

Another key driver of the need to understand language abilities among justice-involved youth is the high prevalence of FASD in justice settings. FASD is a severe neurodevelopmental disorder resulting from teratogenic effects of prenatal alcohol exposure (Bower et al., 2017). Diagnosis of FASD involves a comprehensive interdisciplinary team approach and, in Australia, requires evidence of significant impairment in at least three of ten neurodevelopmental domains: brain structure/neurology, attention, executive functioning, memory, language, motor skills, cognition, affect, adaptive skills/social communication, and academic achievement (Bower & Elliott, 2016). Children living with FASD have increased possibility of encountering adverse environmental circumstances such as maltreatment, violent and disruptive households, and caregivers with mental health difficulties, which can further compromise child development and can necessitate involvement with government child protection services (Coggins, Timler, & Olswang, 2007; Price, Cook, Norgate, & Mukherjee, 2017).

Receptive and expressive language disorder and chronic serous otitis media are among the most common disorders in FASD (Popova et al., 2016). Additionally, craniofacial anomalies, including of the branchial arches that form ear and hearing anatomy, have been identified among children with FASD (Bower & Elliott, 2016; Church, Eldis, Blakley, & Bawle, 1997; Church & Gerkin, 1988). Also prevalent are conduct disorder, difficulties with reasoning and controlling impulsive behaviour, and significant trouble interpreting social and emotional cues. Together, these difficulties can increase the risk of being easily led, problems navigating social relationships and participation in antisocial and offending behaviour (Fast & Conry, 2009; Streissguth et al., 2004). Compared to the global average of 7.7 cases of FASD per 1000 people, FASD prevalence in Canadian justice settings is estimated at 11–23% (Flannigan, Pei, Stewart, & Johnson, 2018), while in Western Australia (WA), 36% of sentenced youth have recently been identified to be living with FASD (Bower et al., 2018).

As superficial chattiness is commonly observed among those living with FASD, it can be easy to overestimate their language capacities (Douglas, 2015; Hand, Pickering, Kedge, & McCann, 2016). For professionals working in legal contexts, there are important consequences for not being aware of and identifying potential language and communication deficits that are common to FASD. Language disorder and impairment in other neurocognitive domains can increase the risk of interrogative suggestibility (for example, *Pora v The Queen*, 2015) and impede successful compliance with sentencing orders (Douglas, 2015; Flannigan et al., 2018). Justice professionals have identified that FASD is relevant to their work practices, which are often verbally mediated (for example, police interviews and court proceedings), and much of the justice workforce report that they would modify their language if they knew the client had FASD (Mutch, Jones, Bower, & Watkins, 2016). Given the dearth of studies describing language disorder associated with FASD among youth sentenced to detention, further research is required to support the justice workforce to respond better to the specific needs of youth in their care.

1.3. Language difference and youth justice

An additional consideration for youth justice systems world-wide is the high proportion of justice-involved youth who are from culturally and linguistically diverse backgrounds. For example, Aboriginal youth make up 73% of the Western Australian (WA) youth detention centre population (Department of Corrective Services, 2016), a proportion that is much higher than the 5% of Aboriginal youth in the total WA youth population (Australian Bureau of Statistics, 2016). In addition to cultural differences, it is likely that difficulties encountered by Aboriginal young people in verbal contexts also reflect language differences that exist between Standard Australian English (SAE) and Aboriginal languages including Aboriginal English (AE) (Eades, 2008, 2012).

In Australia, the national education curriculum reflects culture and language consistent with SAE, and a lack of acknowledgement and response to language difference has been identified as a contributor to education inequity for Aboriginal children (Freeman & Staley, 2017;

Webb & Williams, 2018). Similarly, inequity of access to legal and justice services has been found to result from the failure of police, lawyers and courts to effectively understand or address language difference (Eades, 2008, 2012). This was highlighted in a recent case in the WA Court of Appeal, where an accredited interpreter was not present during police questioning and legal proceedings of an Aboriginal man who did not speak English as his first language (*Gibson v The State of Western Australia*, 2017). The Court heard that language difference between Gibson and the interviewing police, in addition to procedural errors and previously unidentified cognitive impairment would have likely resulted in Gibson having inadequate understanding of legal terminology and processes in which he was participating. After spending five years in prison, Gibson's conviction was overturned. Such cases, and the systemic failings relating to Aboriginal people and their over-representation in justice settings, indicate that current services need to be better equipped to provide equitable justice services to Aboriginal people (Commonwealth of Australia, 2017; Crawford, 2010).

1.4. The present study

We report here the language outcomes from a study examining the prevalence of FASD among youth sentenced to detention in WA (Bower et al., 2018). We undertook this study to estimate (i) the prevalence of languages spoken by youth in detention in WA, and (ii) the prevalence of language disorder among these youth, taking into account the high proportion of Aboriginal young people and the diversity of languages in this population. In addition, we aimed to explore the association between language disorder and involvement with government child protection services, nonverbal cognitive impairment, and FASD. Given that language is one of the neurodevelopmental domains commonly impaired in FASD, we hypothesised that there would be a language ability difference between young people who met the criteria for FASD diagnosis and those who did not. Results from the nine domains assessed as part of the FASD prevalence study (excluding the affect regulation domain, which was not assessed) are reported by Bower et al. (2018).

Examining the language skills of justice-involved youth in WA represents an opportunity to understand language strengths and difficulties among this group where cultural and linguistic diversity is common, and where a high prevalence of FASD is documented (Bower et al., 2018). Identifying and integrating this information is a crucial first step in enabling the youth justice system to accommodate young peoples' language needs, and ultimately influence how youth can communicate with, and therefore participate in and benefit from their services.

2. Methods

2.1. Participants and setting

The participants in this study were part of a FASD prevalence study, which was undertaken among sentenced youth, at WA's Banksia Hill Detention Centre (Banksia Hill) during 2015 to 2016 (Bower et al., 2018; Passmore et al., 2016). Banksia Hill is the only youth detention centre in WA for 10 to 17-year-olds who are remanded or sentenced. During this study, the average daily population at Banksia Hill was 133 (94% male, 73% Aboriginal) (Department of Corrective Services, 2016). Participation was voluntary and only those who had been sentenced to detention could enrol. Of those approached by a research officer, 154 young people (93%) provided written assent and, of these, 113 caregivers provided written consent (Bower et al., 2018). Of the 99 participants who completed the FASD assessment, we report language results of 98 participants who completed at least one of the measures reported here. These participants, who included six females, 91 males, and one young person who identified as transgender, ranged in age from 13.7 to 17.9 years (mean (*M*) = 16.2, standard deviation (*SD*) = 1.2). During caregiver interviews, the research officer asked about and recorded information on the participants' prenatal and developmental histories on a standard form developed for the study (Bower et al., 2018). Table 2 provides participant ethnicity, previous language disorder diagnoses, previous contact with a speech pathologist, history of ear and hearing problems, and diagnostic outcomes.

2.2. Procedure

Following participant assent and caregiver consent, the research officer completed a standard interview with the participants. This included asking the participants to identify their first and any other languages. For participants who identified as speaking English as an addition language (EAL) to an Aboriginal language, their first and other languages were confirmed by their caregivers.

2.3. Assessment and measures

The assessment battery included measures for speakers of SAE, AE, and EAL. The lead speech pathologist (NRK) administered all language assessments. Tasks were randomised to reduce possible order effects. The number of participants who completed each of the assessment subtests is provided in Tables 3 and 4. In this study, after accounting for competency in any other languages, we use the terms 'language disorder' when there is no known associated biomedical condition (American Psychiatric Association, 2013), and 'language disorder associated with 'X'' when there is a known associated biomedical condition (Bishop, Snowling, Thompson, & Greenhalgh, 2017), for example, language disorder associated with FASD.

2.3.1. Language

The Clinical Evaluation of Language Fundamentals, 4th edition, Australian (CELF-4) (Semel, Wiig, & Secord, 2006) was used to assess the language skills of the speakers of SAE and AE, and has previously been used to examine the language skills of justice-involved youth (Anderson et al., 2016). The CELF-4 subtests assess receptive and expressive vocabulary and grammar, phonological and working memory, and discourse comprehension. The test was normed on a sample of youth aged 13- to 21-years from "*all Australian states and territories, and from both urban and rural regions*" (p.13) and who identified 'English' as their most frequently used language (Semel et al., 2006). The CELF-4 Core and Index scores used for this study all have reliability coefficients ≥ 0.90 (Semel et al., 2006). For the purpose of this research, the CELF-4 severity ranges were collapsed from five (above average/ average/ mild/ moderate/ severe) to three as follows: a standard score of ≥ 86, was the criterion for 'average and above', 71–85 for 'mild to moderate difficulties', and ≤ 70, for 'language disorder' – deemed present if one or more Core or Index score was ≤ 70 (≥ 2 SD below the mean).

A second speech pathologist (SL) reviewed a random sample of 20% of the response forms. Inter-rater agreement was 98% and 99% for the expressive subtests: Recalling Sentences and Formulated Sentences, respectively.

For the speakers of SAE, standardised scoring was applied. As there are no known standardised norm-referenced language or verbal cognitive assessments specifically for Aboriginal adolescents, both standardised and adapted assessment scoring were employed for speakers of AE. First, standardised scoring was undertaken according to the test guidelines.

Second, an adapted scoring method was employed for the expressive language subtests, similar to the approach undertaken by Pearce and Williams (2013), also drawing on the work of Butcher (2008), Department of Education (2012), Hudson (1983), and Malcolm (2013). This involved re-scoring the expressive subtests: Recalling Sentences and Formulated Sentences, to account for aspects of language difference including grammar, morphology and semantics. Following data collection, the speech pathologist worked with an accredited interpreter to

Table 1
Examples of adapted scoring of two CELF-4 subtests to account for aspects of Aboriginal English.

Subtest	Item	Participant response	Standardised scoring	Adapted scoring
Recalling Sentences	14.	*"The coach could not find the uniforms that the team wore last year"*	2 (from 3 possible points)	3/3. Plural marking is not required
	19.	*"The girl stopped to buy some milk, even though she was late for school"*	2 (from 3 possible points)	3/3. Quantity marking is not required
Formulated Sentences	16.	*"__Roads are closed because there was a crash"*	1 (out of 2 possible points)	2/2. Determiners are not required
	21.	*"Until the bicycle shop opens, you can buy a new bike"*	0 (out of 2 possible points)	2/2. 'Until' has the meaning of 'when/if'

Note. CELF-4: Clinical Evaluation of Language Fundamentals, Fourth Edition. Adapted scoring drew on the work of Butcher (2008), Department of Education (2012), Hudson (1983), and Malcolm (2013), and the language expertise of the accredited interpreter.

review the interpretation and scoring of the Aboriginal participants whose assessments were scored with both SAE and AE. Table 1 provides examples of adapted scoring of two items from each of the two CELF-4 subtests scored using both the standardised and adapted approaches.

For the speakers of EAL, the primary language measures employed were self- and caregiver-reported concerns with language and communication and a non-standardised non-word repetition (NWR) task, a measure of phonological short-term memory. While caregiver-reported concerns together with NWR have good utility in discriminating between multilingual speakers who have language disorder and multilingual speakers who do not have language disorder (Boerma & Blom, 2017; Li'el, 2017; Paradis, Schneider, & Duncan, 2013), we have also included self-report in this study for the speakers of EAL, as it was not always possible to obtain information from caregivers. Caregiver-reports were obtained by the research officer and recorded on a standard form. Questions elicited information about each participant's early language development, communication skills as compared to other children of the same age, and abilities to understand others and express themselves. Caregiver-reported concerns were deemed to signify language difficulties if caregivers reported for example: that the young person had delayed first language development; that communication skills were below that of the same-age peers; or that the young person had difficulties understanding others or expressing themselves verbally. Self-reported concerns were recorded on an interviewer-administered questionnaire, which was designed to elicit information about receptive and expressive language, based on a questionnaire used with justice-involved youth (Burrows & Yiga, 2012). This was administered by the lead speech pathologist. Self-reported concerns were deemed to signify language difficulties if participants reported that in both their first and other languages, for example: that they understand half or less of what others say, or forget what is said; that they need more time to understand what has been said; that they have difficulties saying what they want to say and being understood; or that they feel that their communication skills are below that of their same age peers.

The NWR task contained 16 non-words (one to five syllables in length), and was designed with a speech pathologist experienced in working with Aboriginal children, based on existing NWR tasks (Dollaghan & Campbell, 1998; Salter, 2013). Participants were presented with the non-words verbally, one at a time, and asked to repeat them. If the attempt was incorrect, the non-word was repeated up to three times. Difficulties were deemed as signifying phonological short term memory difficulties if participants required three or more different words to be repeated.

'Language disorder' was deemed present if language and communication concerns were identified by caregivers and/or participants and difficulties were present on the NWR task. If only one of these criteria was met, language difficulties were deemed present, but a classification of language disorder was not made. Participants who had no reported concerns and no difficulties with NWR were deemed to have 'average and above' language skills.

The CELF-4 Screening Test (Semel, Wiig, & Secord, 2004) was also used with speakers of EAL to provide non-diagnostic, qualitative information about SAE language ability. This informed recommendations made for those working with the young people. Criterion scores are also available for this test for 9- to 21-year olds.

2.3.2. Nonverbal cognition

Nonverbal cognition was measured as part of the neuropsychological assessment (Passmore et al., 2016) using the Perceptual Reasoning Index (PRI) from the Wechsler Abbreviated Scale of Intelligence, Second Edition (Wechsler, 2011), or the Full Scale Intelligence Quotient (FSIQ) from the Wechsler Nonverbal Scale of Ability (Wechsler & Naglieri, 2006), both with reliability coefficients ≥ 0.90. Impairment was based on a standard score of ≤ 70 on either measure.

2.3.3. Prenatal alcohol exposure (PAE) and FASD

During caregiver interviews, the research officer assessed PAE for the study participants using the Alcohol Use Disorders Identification Test–Consumption (Audit-C) (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998) where possible, and drew on other sources (including relatives who had first-hand knowledge of the birth mother's pregnancy, or legal and health records) if information directly from the birth mother was not available. Using the Australian Guide to the Diagnosis of FASD (Bower & Elliott, 2016), the paediatrician (RCM), together with the interdisciplinary team, reviewed all the information gathered through the assessment process, including level of reported PAE, and determined whether a FASD diagnosis was warranted. The PAE and diagnostic outcomes of all nine assessed domains are reported by Bower et al. (2018).

2.4. Statistical analysis

IBM SPSS Statistics Version 25 was used to analyse the data. The Chi-square test of independence was used to assess associations between categorical data and, where normality assumptions were met, *t*-tests were used to examine differences within and between groups for scaled and standard scores, with an alpha of 0.05. Effect sizes are reported.

2.5. Ethics

This study was approved by the WA Aboriginal Health Ethics Committee (approval number 582), the University of WA Human Research Ethics Committee (HREC) (approval number RA/4/1/7116), and Curtin University HREC (approval number HRE2018-0117).

3. Results

3.1. Language groups of young people in detention

Eight first-languages were identified. The most common were AE and SAE (Table 2), followed by Aboriginal languages additional to English (EAL) from regional and remote regions of WA. Speakers of SAE ranged in age from 14.3 to 17.9 years ($M = 16.9$, $SD = 1.0$), speakers of AE from 13.7 to 17.9 years ($M = 16.0$, $SD = 1.1$), and speakers of EAL from 13.7 to 17.8 years ($M = 15.5$, $SD = 1.2$). Second and third languages included AE (18 participants), and languages from regional and remote WA (10 participants). Eight non-Australian languages from African, Asian and Polynesian regions were reported as second and third languages. Overall, 19 different languages were identified and 31 participants (32%) identified as multilingual.

Table 2
Participant characteristics and diagnostic outcomes by language group (n = 98).

	SAE		AE		EAL	
	n (%)		*n* (%)		*n* (%)	
Ethnicity						
Australian non-Aboriginal	15	(54)	0	(0)	0	(0)
Australian Aboriginal	3	(11)	52	(100)	18	(100)
Other*	10	(36)	0	(0)	0	(0)
History of language disorder	0	(0)	3	(6)	0	(0)
Previous speech pathology contact	1	(4)	2	(4)	0	(0)
Ear and hearing problems**	2	(7)	10	(19)	3	(17)
FASD diagnosis	2	(7)	24	(46)	10	(55)
Nonverbal cognitive impairment	3	(11)	11	(21)	4	(22)
Language outcome						
Language disorder	6	(21)	35 ±	(67)	4	(22)
Mild to moderate difficulties	10	(36)	12	(23)	7	(39)
Average and above	12	(43)	5	(10)	7	(39)

Note. *Participants of Asian, African, and New Zealand ethnicity. SAE: Standard Australian English; AE: Aboriginal English; EAL: English as an additional language; **Recurrent ear infections (3 or more) and/or grommets, n = 15 (additional eardrum surgery, n = 2; ongoing hearing difficulties, n = 3); ± Language disorder was deemed present for one participant who completed the EAL test battery in addition to a score well below floor on the CELF-4 Screening Tool, due to administrative error.

3.2. Language disorder

Seventy-four participants demonstrated language skills below the average range expected for their age and 45 met the criteria for language disorder adopted for this study. Three of six females (50%) and 42 of 91 males (46%) had language disorder. Of the 28 participants confirmed as known to child protection government services, 46% were identified with language disorder, compared with 40% of the 52 participants confirmed as not known to child protection government services.

3.3. Speakers of SAE and AE

3.3.1. Standardised and adapted scoring for speakers of AE

Table 3 presents comparisons between the standardised and adapted scoring of the speakers of AE. Compared with standardised scoring, adapted scoring produced higher scores for the two CELF-4 subtests: Recalling Sentences, Formulated Sentences, and hence for the CELF-4 composite scores: Core Language Score, Expressive Language Index and Language Memory Index. Three participants who had met criteria for language disorder based on standardised scoring no longer met the criteria with adapted scoring, and were no longer identified as such.

Table 3
Comparisons of standardised and adapted scoring outcomes of the CELF-4 measures for speakers of Aboriginal English.

CELF-4 measure	Standardised scoring		Adapted scoring	*t*	*p*	*d*
	n	*M* (*SD*)	*M* (*SD*)			
Recalling sentences	51	5.2 (3.2)	6.3 (3.4)	−9.5	< 0.001	1.3
Formulated sentences	51	3.7 (3.0)	6.3 (4.0)	−9.3	< 0.001	1.3
Core language score	50	65.7 (17.9)	72.2 (18.7)	−11.3	< 0.001	1.6
Expressive language index	50	67.4 (17.2)	75.5 (18.6)	−11.5	< 0.001	1.6
Language memory index	46	69.7 (16.5)	78.2 (17.7)	−11.3	< 0.001	1.7

*Note.*Two-tailed *t*-tests and Cohen's *d*; CELF-4: Clinical Evaluation of Language Fundamentals, Fourth Edition. Subtests have a mean of 10 and a SD of 3; and the Core and Index scores have a mean of 100 and a SD of 15.

3.3.2. Language skills of speakers of SAE and AE

Table 4 presents comparisons of language scores for the speakers of SAE and AE. The mean language scores of the SAE and AE speakers combined fell below the average range for each CELF-4 subtest, Core, and Index score. Table 5 presents the CELF-4 language outcomes of speakers of SAE and AE by severity range. Less than half of the speakers of SAE and AE performed in the average and above range on each CELF-4 Core and Index score. Seventy-one percent scored below the average range for their age in receptive language, 59% in expressive language and 62% in language memory.

3.4. Language skills of speakers of English as an Additional Language (EAL)

Five of the 18 speakers of EAL had reported concerns with language development and communication skills. Two of these five had both caregiver- and self-reported concerns, one had caregiver-reported concerns only, and two had self-reported concerns only. Six of the 18 speakers of EAL required three or more non-words to be repeated in the NWR task and were deemed to have difficulties with phonological short term memory. For language disorder to be deemed present, speakers of EAL needed to have caregiver-reported concerns and difficulties with phonological short term memory (Boerma & Blom, 2017; Li'el, 2017; Paradis et al., 2013). We also considered self-reported concerns of language and communication skills if information could not be obtained from caregivers. Four of the 18 speakers of EAL had reported concerns (both caregiver- and self-reported concerns, n = 2; caregiver-reported concerns only, n = 1; self-reported concerns only, n = 1) and difficulties with phonological short term memory, and language disorder was therefore deemed present for them.

In addition, fifteen speakers of EAL completed the CELF-4 Screening Test, with scores ranging from six to 23. Based on their age, 23 was the expected criterion score for all 15 participants. Two achieved this score. Eleven (73%) participants scored ≤17 (the expected criterion score for a 9-year old English speaker, and floor for any child aged 9 years or older).

3.5. Language, nonverbal cognitive impairment and FASD

The mean language scores of the speakers of SAE and AE were compared by nonverbal cognitive impairment, as presented in Table 6. Performance of those with nonverbal cognitive impairment fell in the range of language disorder, while those without nonverbal cognitive impairment fell in the mild to moderate difficulties and average and above ranges for both SAE and AE speakers. However, there was no statistical association between language disorder and nonverbal cognitive impairment (χ^2 = 2.05, p = .15, Ø = 0.15) for the total participant group (speakers of SAE, AE and EAL).

The mean language scores of the speakers of SAE and AE were compared by FASD diagnosis, as shown in Table 7. Participants with FASD scored lower on the Core and Index scores than those who did not have FASD (medium to large effect size). Of the participants who did not have nonverbal cognitive impairment, those with FASD also had lower Core and Index scores than those who did not have FASD (small to medium effect size).

Of the 45 participants who met the criteria for language disorder used in the current study, 25 (56%) were identified according to our criteria as having FASD, eight (18%) of whom were also identified with nonverbal cognitive impairment. Four of the 25 participants with language disorder associated with FASD only met criteria for impairment on three neurodevelopmental domains (the minimum required to warrant a diagnosis of FASD). Of the 20 (44%) with language disorder who did not meet criteria for FASD, three (7%) were identified with nonverbal cognitive impairment. Among the SAE and AE speakers with language disorder, deficits in multiple language skills (the Core, or more than one Core and Index score) were identified in 16 (76%) of the participants with FASD and 14 (70%) who did not have FASD.

Table 4
Comparisons of CELF-4 language scores for speakers of Standard Australia English (SAE) and Aboriginal English (AE).

CELF-4 measure	Total		SAE		AE		*t*	*p*	*d*
	n	*M* (*SD*)	*n*	*M* (*SD*)	*n*	*M* (*SD*)			
Recalling sentences	79	6.7 (3.3)	28	7.3 (2.9)	51	6.3 (3.4)	1.28	0.202	0.31
Formulated sentences	79	6.7 (3.6)	28	7.4 (2.8)	51	6.3 (4.0)	1.37	0.176	0.30
Word classes–receptive	78	5.3 (3.1)	28	7.5 (2.8)	50	4.0 (2.4)	5.75	< 0.001	1.32
Word classes–expressive	78	6.6 (3.7)	28	9.6 (3.2)	50	5.0 (2.9)	6.52	< 0.001	1.52
Word classes-total	78	5.8 (3.4)	28	8.5 (3.2)	50	4.3 (2.6)	6.21	< 0.001	1.43
Word definitions	78	6.6 (3.7)	28	9.3 (3.4)	50	5.2 (2.9)	5.72	< 0.001	1.32
Understanding spoken paragraphs	74	6.0 (3.1)	28	7.2 (3.0)	46	5.3 (3.0)	2.73	0.008	0.66
Semantic relations	73	6.8 (3.2)	27	8.4 (2.9)	46	5.8 (3.0)	3.62	0.001	0.88
Core language score	78	78.2 (19.2)	28	88.8 (15.5)	50	72.2 (18.7)	3.98	< 0.001	0.96
Receptive language index	73	77.2 (15.5)	27	87.0 (13.3)	46	71.5 (13.8)	4.69	< 0.001	1.14
Expressive language index	78	80.2 (18.3)	28	88.7 (14.6)	50	75.5 (18.6)	3.25	0.002	0.79
Language memory index	73	80.8 (16.4)	27	85.3 (13.1)	46	78.2 (17.7)	1.82	0.072	0.46

Note. Two-tailed *t*-tests and Cohen's *d*. CELF-4: Clinical Evaluation of Language Fundamentals, Fourth Edition. Standardised scores are reported, except for the subtests and Core and Index scores that were re-scored with adapted scoring. Subtests have a mean of 10 and a SD of 3; and the Core and Index scores have a mean of 100 and a SD of 15.

3.6. Language disorder, FASD, and history of ear or hearing concerns

Of the 25 participants who met our study criteria for language disorder associated with FASD, seven (28%) had a history of recurrent ear infections or grommets, two of whom also had additional eardrum surgery.

4. Discussion

We investigated the language skills of 13- to 17-year old young people sentenced to detention in WA, where 73% of youth in detention identify as Aboriginal, and where high prevalence of FASD has been documented. As anticipated, broad diversity in languages was identified among the participants. Less than one third were first-language speakers of SAE and nearly one fifth did not speak an English language as their first language. Language diversity in youth justice differs across Australian states and territories. For example, 94% of justice-involved youth in the Northern Territory speak up to three languages other than English (Commonwealth of Australia, 2017), while in NSW, 0.4% of justice-involved youth are speakers of EAL (New South Wales Government, 2017). The rich heterogeneity of language repertoires among youth in detention should be recognised as significant strengths of the young people. They bring with them notable language backgrounds and are developing as multilingual learners and communicators (Freeman & Staley, 2017). Their language abilities nurture pride, self-esteem and respect (Commonwealth of Australia, 2012). For Aboriginal people, sustaining culture and perpetuating history through 'stories shared' are integrally reliant on the 'spoken word', and being a story holder and a story teller is venerated in Aboriginal cultures (Commonwealth of Australia, 2012). The interconnectedness of language and health outcomes needs to be acknowledged and considered in the way services are provided to Aboriginal young people (Department of Health, 2017).

Considering competency in SAE is also a critical step in enabling youth justice systems to better respond to young peoples'

Table 6
Comparison of CELF-4 language scores for speakers of Standard Australian English (SAE) and Aboriginal English (AE), by nonverbal cognitive impairment.

CELF-4 Measure	With nonverbal cognitive impairment		Without nonverbal cognitive impairment		*t*	*p*	*d*
	n	*M (SD)*	*n*	*M (SD)*			
Core language score							
SAE	3	68.3 (11.4)	25	91.2 (14.1)	*		
AE	11	62.3 (19.8)	39	75.0 (17.6)	2.06	0.044	0.69
Receptive language index							
SAE	3	69.0 (9.2)	24	89.2 (12.1)	*		
AE	8	63.2 (18.1)	38	73.2 (12.4)	1.90	0.064	0.64
Expressive language index							
SAE	3	70.0 (10.4)	25	91.0 (13.5)	*		
AE	11	65.9 (19.6)	39	78.2 (17.6)	1.99	0.052	0.66
Language memory index							
SAE	3	69.7 (5.7)	24	87.3 (12.5)	*		
AE	8	67.1 (22.1)	38	80.5 (16.0)	2.00	0.051	0.69

Note. Two tailed *t*-tests and Cohen's *d;* *Insufficient numbers to support comparisons for SAE speakers. CELF-4: Clinical Evaluation of Language Fundamentals, Fourth Edition. Standardised scores are reported except for the measures that were re-scored with adapted scoring. Core and Index scores have a mean of 100 and a SD of 15.

Table 5
CELF-4 language outcomes of speakers of Standard Australian English (SAE) and Aboriginal English (AE) by severity range.

CELF-4 measure	Total	Average and above		Mild to moderate difficulties		Language disorder	
		SAE	AE	SAE	AE	SAE	AE
		n	*n*	*n*	*n*	*n*	*n*
Core language score	78	16	13	9	11	3	26
Receptive language index	73	14	7	11	16	2	23
Expressive language index	78	17	15	8	15	3	20
Language memory index	73	13	15	9	17	5	14

Note. CELF-4: Clinical Evaluation of Language Fundamentals, Fourth Edition; Outcomes are based on standardised scores except for the measures that were re-scored with adapted scoring.

Table 7
Comparison of CELF-4 mean language scores by FASD diagnosis and nonverbal cognitive impairment, for speakers of Standard Australian English (SAE) and Aboriginal English (AE).

CELF-4 measure	Inclusive of nonverbal cognitive impairment							Excluding nonverbal cognitive impairment						
	With FASD		Without FASD					With FASD		Without FASD				
	n	*M* (*SD*)	*n*	*M* (*SD*)	*t*	*p*	*d*	*n*	*M* (*SD*)	*n*	*M* (*SD*)	*t*	*p*	*d*
Core language score														
SAE	2	87.0 (19.8)	26	88.9 (15.6)	*			2	87.0 (19.8)	23	91.6 (14.1)	*		
AE	22	64.6 (14.3)	28	78.2 (19.8)	2.70	0.010	0.78	13	68.2 (11.3)	26	78.4 (19.4)	1.74	0.089	0.64
Receptive language index														
SAE	2	82.0 (9.9)	25	87.4 (13.6)	*			2	82.0 (9.9)	22	89.9 (12.2)	*		
AE	19	67.6 (13.5)	27	74.2 (13.6)	1.62	0.112	0.49	13	69.9 (10.8)	25	74.9 (13.0)	1.18	0.247	0.41
Expressive language index														
SAE	2	86.0 (22.6)	26	89.0 (14.5)	*			2	86.0 (22.6)	23	91.4 (13.2)	*		
AE	22	67.5 (13.2)	28	81.7 (20.0)	3.02	0.004	0.84	13	70.5 (10.0)	26	82.0 (19.5)	2.42	0.020	0.74
Language memory index														
SAE	2	86.0 (17.0)	25	85.3 (13.2)	*			2	86.0 (17.0)	22	87.4 (12.5)	*		
AE	19	70.8 (13.2)	27	83.3 (18.8)	2.49	0.017	0.77	13	73.5 (8.9)	25	84.1 (17.8)	2.44	0.020	0.75

Note. Two sample *t*-tests and Cohen's *d*; *Insufficient numbers to support comparisons for SAE speakers. CELF-4: Clinical Evaluation of Language Fundamentals, 4th Edition; Standardised scores are reported except for the measures that were re-scored with adapted scoring. Core and Index scores have a mean of 100 and a SD of 15.

communication needs. Indeed, SAE is the common currency of verbal exchange in justice systems in Australia. We found that most of the speakers of EAL, who had an average age of 15 years, scored at or below the expected range of a 9-year-old across vocabulary, semantics, following instructions and recalling verbal information in SAE. The distinct gap identified between chronological age and age of SAE performance raises concern that SAE language expectations may be placed on young people who do not have the capacity to meet them. For example, Lount, Hand, Purdy, and France (2017) identified that young people in the New Zealand youth justice system experienced difficulties understanding legal proceedings and felt a lack of control, even where their primary language was the same as that used in the court room. In WA, legislation requires language ability to be considered in the justice system. The *Young Offenders Act 1994* (Government of Western Australia, 2018a) mandates that communication with young people employs simple language that they are likely to understand, for example, when: serving notices and issuing fines (Sections 43, 59); explaining court proceedings and orders (Sections 44, 52, 137); and making the rules of a detention centre known (Section 181). Although interpreter services exist, they are not always used (for example, *Gibson vs The State of Western Australia, 2017*). Further, Eades (2008) explains that interpreters are often not used for speakers of AE, and unnoticed language differences, including conceptualisation and thinking, can increase risk for suggestibility. Our findings of diversity in first languages and low levels of SAE competence among speakers of EAL indicate that language supports in youth justice need to be prioritised and evaluated for their effectiveness.

When examining language disorder, it is important to note that 'language disorder' itself may be over- or under-identified due to language difference, and 'language difference' needs to be acknowledged and accounted for when undertaking communication and verbal cognitive assessments (Gould, 2008). According to the criteria in this study, 75% of young people did not demonstrate language skills consistent with their age and nearly one in two met criteria for language disorder. While many of the Aboriginal participants in the current study referred to "English" as their first language, the researchers understood the language used to be reflective of both AE and SAE, and adapted scoring and interpretation of participants' performance was undertaken in addition to standardised scoring where possible. Berry and Hudson (1997) discuss the lack of differentiation between AE and SAE, and the potential for supports to focus on developing young peoples' awareness of the differences in their languages and matching their language use to the context. The development of these higher-order language (metalinguistic) skills can be supported by teachers and other service providers who are working with Aboriginal students (Webb & Williams, 2018). Failure to respond to language differences may potentially lead to a mismatch in expectations related to English language use between Aboriginal young people and their non-Aboriginal peers and service providers.

Considering the complexity of language difference, our study was able to determine a prevalence of language disorder similar to the 52% and 46% identified among justice-involved youth in other states in Australia (Snow & Powell, 2008, 2011), and the 44% identified among justice-involved youth in England (Hopkins et al., 2017). Our findings are also similar to youth justice samples that included both Aboriginal and non-Aboriginal participants (New South Wales Government, 2017; Snow, Woodward, Mathis, & Powell, 2016). These comparative studies in Australia and in England applied similar language disorder criteria. When compared with typically developing youth who may offend, youth with language disorder may be less able to self-advocate and provide coherent explanations to police and lawyers about alleged events or criminal behaviour (Snow & Powell, 2011). Additional neurocognitive deficits, such as impairments of executive function and memory can further increase risk for suggestibility and manipulation by those around them (Douglas, 2015). In the current study, eleven (24%) of the 45 participants with language disorder also met criteria for impairment in nonverbal cognition, eight of whom also met criteria for FASD. These participants would likely experience significant challenges as they navigate youth justice and detention centre settings, and may fail to meet the social, academic and occupational expectations associated with their transition out of detention. Upon further testing, they may be considered to have an intellectual disability and therefore receive supports, for example, through disability services. Similar service provision may not be considered for those with language disorder who do not have nonverbal cognitive impairment. Further, this group of young people may appear more competent than they are due to their higher intellectual functioning, and this may result in their communication difficulties being misinterpreted as non-compliance or rudeness (Snow et al., 2012; Snow & Powell, 2008). Improved service capacity is needed to better identify and respond to language disorder among justice-involved youth.

The only known Australian study to consider language skills in the context of FASD and youth justice included a self-report measure for FASD, and no participants reported they had a FASD diagnosis (Snow & Woodward, 2016). Our study, which reports the language results from a FASD assessment, identified that overall, young people with FASD had

lower language scores when compared to young people without FASD, even among those who did not have nonverbal cognitive impairment. Further, among the 25 young people identified with language disorder associated with FASD according to our study's criteria, a similar degree of impairment in both receptive and expressive language was apparent. These young people will struggle to express themselves in a manner that reflects their chronological age and to adequately understand what is said to them by others. This is consistent with the profile of non-justice-involved youth with FASD (Proven, Ens, & Beaudin, 2014), and with the profile of justice-involved youth with FASD, of whom most were sentenced to a community order (Conry & Lane, 2009). Regardless of FASD diagnosis however, most of the young people in our study who were identified with language disorder were vulnerable across multiple language skills. Our findings likely reflect that language development is sensitive to developmental and environmental circumstances, and young people who become involved in youth justice are at increased risk of these and of having language disorder (Anderson et al., 2016; Commonwealth of Australia, 2017; Kinner et al., 2014). Further research exploring prenatal alcohol exposure, adverse environmental risks and language disorder is needed (Price et al., 2017), and is important in better understanding the effects of historical and sociocultural factors that may have led to drinking in pregnancy, such as the effects of colonisation and the separation of children from families experienced by first nations peoples (Commonwealth of Australia, 1997; Rogers, McLachlan, & Roesch, 2013).

The confluence of risk circumstances experienced by justice-involved youth denotes a need for targeted therapeutic interventions. Therapy and services for these young people need to be informed by their language abilities and culture (Gregory & Bryan, 2011; Rogers et al., 2013; Snow & Powell, 2011), and targeting areas of need, rather than a diagnosis, such as FASD, is recommended (Adnams et al., 2007; Helgesson et al., 2018). In addition to the *Young Offenders Act* mentioned above, the WA Youth Custodial Rules (YCR) (Department of Justice, 2016) require, for example, that programs be "*developmentally, culturally and linguistically appropriate*" (YCR 221, p.2); that health services provide "*a clear explanation of any proposed treatment, including risks and alternatives*" (YCR 710, p.1); and that interpreters are accessible (YCR 302, 710). Adherence to these YCR is particularly important for justice-involved youth with language disorder. They have been identified to report more frequent self-harm and use of illicit substances, compared with justice-involved youth without language disorder (Hughes et al., 2017), suggesting the need for provision of a personalised and prescriptive approach to health, educational, psychological, and criminogenic programs. Prior to this study, the language diversity and language needs of youth in detention in WA were not understood. Therefore, youth justice programs have potentially been at risk of not meeting the language, health, and rehabilitation needs of young people with previously unidentified language disorder or low English competency.

To date, speech pathology services have been under-recognised and under-utilised in justice settings in Australia and world-wide. Speech pathologists are tertiary trained allied health professionals who specialise in the assessment and treatment of communication (speech and language) and swallowing disorders. Due to the high prevalence of language disorder among justice-involved youth, and communication disorders frequently co-occurring with and contributing to mental health, behaviour, and learning problems, speech pathologists can play a key role in supporting health outcomes, access to support, and equitable justice processes (Caire, 2009; Coles et al., 2017; Martin, 2018).

Snow and Woodward (2016) implemented speech and language intervention in an Australian youth detention centre with six young people (including four Aboriginal and Torres Strait Islander participants). The young peoples' case histories included prenatal opiate exposure, substance misuse, lived trauma, written language difficulties, school exclusion, violent behaviour, and mental health disorders. All six participants demonstrated gains in language and communication skills, for example, comprehension, interpretation of non-literal language, conflict resolution, verbal expression of thoughts and feelings, and confidence in their talking. In England, benefits of speech pathology services have also been demonstrated among repeat and serious offenders (Gregory & Bryan, 2011). The authors reported that among those reassessed after language and social communication skills therapy, measurable gains were made. Evaluation of both intervention studies revealed that youth justice staff also benefited – they developed increased understanding of communication problems, which informed how they supported and provided services to young people (Bryan & Gregory, 2013; Snow, Bagley, & White, 2017).

There are opportunities in police and court settings for language disorder and FASD to be responded to. Court-appointed communication assistants (also known as intermediaries), who are often speech pathologists with additional training, can provide impartial services to help facilitate communication between legal parties and defendants, witnesses and victims who have language or other neurocognitive and mental health disorders (Plotnikoff & Woolfson, 2015; Stewart, Woodward, & Hepner, 2015; Talking Trouble Aotearoa New Zealand, 2018). In WA, the *Evidence Act 1906* (Section 106F) permits this type of service provision (Government of Western Australia, 2018b). Results from our study highlight the need to implement a communication assistant service or similar in WA's youth justice system. Undertaking this in collaboration with local cultural advisors and existing accredited interpreter services will be important to ensure a culturally and linguistically sensitive model is developed.

Our findings confirm the high prevalence of previously unidentified language disorder among justice-involved youth. Only three young people in this study had previously been identified with language disorder, and notably, all three were identified with FASD (without nonverbal cognitive impairment), one prior to, and two during the FASD prevalence study (Bower et al., 2018). All young people in this study had been to school, and the proportion of participants with language disorder who were confirmed as known to government child protection services reflects that found in previous research (Snow & Powell, 2011). Of those with language disorder associated with FASD, 28% had a history of ear and hearing problems. This highlights the missed opportunities within multiple services to identify and respond to language and neurocognitive vulnerability earlier in a child's life.

Strengths of this study included our consultation with clinicians and researchers across Australia to refine the language assessment of young people in a justice setting and in the context of language diversity. The involvement of accredited interpreters in this study was an invaluable means of facilitating two-way learning with the research team about language development, language difference, and language disorder. With a lack of standardised norm-referenced language assessments available for use with Aboriginal adolescents, local Aboriginal cultural and language advisors and accredited interpreters have a critical role to play in the development and administration of tools that consider and examine communication skills of Aboriginal youth. Voluntary participation may have led to selection bias, however over 70% of those eligible to participate were recruited, which resulted in a representative sample of youth in detention participating (Bower et al., 2018). Limitations of this study include being unable to observe and assess a full range of communication skills in the setting of a youth detention centre and difficulties obtaining caregiver reports. Caregiver-reports for the speakers of EAL were sought in consideration of language ability, however we also considered self-reported information, which was gathered by the lead speech pathologist who was experienced and familiar with working with Aboriginal youth at Banksia Hill prior to this study in a different role. The practical difficulties of language assessment demonstrated in this study reflect the complex reality that clinicians are faced with, as they work with justice-involved populations.

5. Conclusion

We have documented rich language diversity, as well as high levels of communication vulnerability and language disorder among youth sentenced to detention in WA. The number of languages spoken by justice-involved populations and the high prevalence of both language disorder and FASD increases the level of complexity the current youth justice workforce encounter in their professional interactions with, and therapeutic services provided to, young people. Together with previous studies, our findings highlight the importance of speech pathologists in assessing and understanding language needs of justice-involved youth. Our findings indicate that speech pathology is warranted as core service in the WA youth justice system to better identify and respond to the communication needs of young people in their care. Further, collaborative approaches with local cultural and language advisors, including accredited interpreters are required in WA's youth justice system, so that culturally and linguistically appropriate resources and methods can be used to better identify communication strengths and difficulties. Further research is recommended to examine the impact of language diversity, language disorder, and FASD on the effectiveness of health, educational, psychological, and criminogenic rehabilitation programs provided in justice settings.

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Declarations of interest

None.

References

Adnams, C. M., Sorour, P., Kalberg, W. O., Kodituwakku, P. W., Perold, M. D., Kotze, A., & May, P. A. (2007). Language and literacy outcomes from a pilot intervention study for children with FASD in South Africa. *Alcohol, 41*, 403–414. https://doi.org/10.1016/j.alcohol.2007.07.005.

American Psychiatric Association (2013). *The diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, USA: American Psychiatric Association.

Anderson, S. A. S., Hawes, D. J., & Snow, P. C. (2016). Language impairments among youth offenders: A systematic review. *Children and Youth Services Review, 65*, 195–203. https://doi.org/10.1016/j.childyouth.2016.04.004.

Australian Bureau of Statistics (2016). 2016 census community profiles: Western Australia. http://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/communityprofile/5?opendocument/, Accessed date: 23 April 2018.

Berry, R., & Hudson, J. (1997). *Making the jump: A resource book for teachers of Aboriginal students.* Perth, Australia: Catholic Education Western Australia.

Bishop, D. V. M., Snowling, M. J., Thompson, P. A., Greenhalgh, T., & the CATALISE-2 consortium (2017). Phase 2 of CATALISE: A multinational and multidisciplinary Delphi consensus study of problems with language development: Terminology. *The Journal of Child Psychology and Psychiatry, 58*, 1068–1080. https://doi.org/10.1111/jcpp.12721.

Boerma, T., & Blom, E. (2017). Assessment of bilingual children: What if testing both languages is not possible? *Journal of Communication Disorders, 66*, 65–76. https://doi.org/10.1016/j.jcomdis.2017.04.001.

Bower, C., Elliott, E. J., & on behalf of the Steering Group (2016). Report to the Australian Government Department of Health: "Australian Guide to the diagnosis of Fetal Alcohol Spectrum Disorder (FASD)". https://www.fasdhub.org.au/fasd-information/assessment-and-diagnosis/guide-to-diagnosis/, Accessed date: 20 August 2018.

Bower, C., Elliott, E. J., Zimmet, M., Doorey, J., Wilkins, A., Russell, V., & Watkins, R. (2017). Australian guide to the diagnosis of foetal alcohol spectrum disorder: A summary. *Journal of Paediatrics and Child Health, 53*, 1021–1023. https://doi.org/10.1111/jpc.13625.

Bower, C., Watkins, R. E., Mutch, R. C., Marriott, R., Freeman, J., Kippin, N. R., & Giglia, R. (2018). Fetal alcohol spectrum disorder and youth justice: A prevalence study among young people sentenced to detention in Western Australia. *British Medical Journal Open, 8*, e019605.

Brownlie, E. B., Beitchman, J. H., Escobar, M., Young, A., Atkinson, L., Johnson, C., ... Douglas, L. (2004). Early language impairment and young adult delinquent and aggressive behaviour. *Journal of Abnormal Child Psychology, 32*, 453–467.

Bryan, K., & Gregory, J. (2013). Perceptions of staff on embedding speech and language therapy within a youth offending team. *Child Language Teaching and Therapy, 29*, 359–371. https://doi.org/10.1177/0265659013482930.

Burrows, S., & Yiga, I. (2012). *Youth offending and speech and language therapy (A controlled study).* London, UK: Ealing Council.

Bush, K., Kivlahan, D. R., McDonell, M. B., Fihn, S. D., & Bradley, K. A. (1998). The AUDIT Alcohol Consumption Questions (AUDIT-C): An effective brief screening test for problem drinking. *Archives of Internal Medicine, 158*, 1789–1975. https://doi.org/10.1001/archinte.158.16.1789.

Butcher, A. (2008). Linguistic aspects of Australian Aboriginal English. *Clinical Linguistics & Phonetics, 22*, 625–642. https://doi.org/10.1080/02699200802223535.

Caire, L. (2009). Exploring the need for the speech pathologist in forensic and mental health settings. *ACQuiring Knowledge in Speech, Language and Hearing, 11*, 157–159.

Church, M. W., Eldis, F., Blakley, B. W., & Bawle, E. V. (1997). Hearing, language, speech, vestibular, and dentofacial disorders in fetal alcohol syndrome. *Alcoholism: Clinical and Experimental Research, 21*, 227–237.

Church, M. W., & Gerkin, M. A. (1988). Hearing disorders in children with fetal alcohol syndrome: Findings from case reports. *Pediatrics, 82*, 147–154.

Coggins, T. E., Timler, G. R., & Olswang, L. B. (2007). A state of double jeopardy: Impact of prenatal alcohol exposure and adverse environments on the social communicative abilities of school-age children with fetal alcohol spectrum disorder. *Language, Speech, and Hearing Services in Schools, 38*, 117–127. https://doi.org/10.1044/0161-1461(2007/012.

Coles, H., Gillett, K., Murray, G., & Turner, K. (2017). *Justice evidence base.* London, UK: The Royal College of Speech and Language Therapists. https://www.rcslt.org/speech_and_language_therapy/slt_work_settings/justice_slcn/justice_evidence_base2017/, Accessed date: 15 August 2018.

Commonwealth of Australia (1997). *Bringing them home: National inquiry into the separation of Aboriginal and Torres Strait Islander children from their families.* Sydney, NSW: Human Rights and Equal Opportunity Commission. Viewed at https://www.humanrights.gov.au/sites/default/files/content/pdf/social_justice/bringing_them_home_report.pdf/.

Commonwealth of Australia (2012). Our land our languages: Language learning in Indigenous Communities. *House of Representatives*Canberra, Australia: Standing Committee on Aboriginal and Torres Strait Islander Affairshttps://www.aph.gov.au/Parliamentary_Business/Committees/House_of_representatives_Committees?url=/atsia/languages2/report.htm/, Accessed date: 1 August 2018.

Commonwealth of Australia (2017). *Report of the Royal Commission and Board of Inquiry into the protection and detention of children in the Northern Territory.* Barwon, Australia: Commonwealth of Australia.

Conry, J., & Lane, K. (2009). Characteristics of youth with FASD on adjudicated probation orders. *Final report to the Department of Justice Canada, Youth Justice Policy and British Columbia Ministry of Children and Family Development.* Maple Ridge, Canada: The Asante Centre.

Crawford, C. (2010). Families impacted by the criminal justice system on the frontier: A new model required. *Psychiatry, Psychology and Law, 17*, 464–475. https://doi.org/10.1080/13218711003739516.

Department of Corrective Services (2016). *2015–2016 Annual report.* Perth, Australia: Government of Western Australia.

Department of Education (2012). *Tracks to two-way learning.* Perth, Australia: Department of Education.

Department of Health (2017). *My life my lead – opportunities for strengthening approaches to the social determinants and cultural determinants of Indigenous health: Report on the national consultations.* Canberra, Australia: Commonwealth of Australia.

Department of Justice (2016). Youth custodial rules. http://www.correctiveservices.wa.gov.au/youth-justice/juvenile-custodial-rules.aspx/, Accessed date: 22 November 2017.

Dollaghan, C., & Campbell, T. E. (1998). Nonword repetition and child language impairment. *Journal of Speech, Language, and Hearing Research, 41*, 1136–1146. https://doi.org/10.1044/jslhr.4105.1136.

Douglas, H. (2015). Foetal alcohol spectrum disorders: A consideration of sentencing and unreliable confessions. *Journal of Law and Medicine, 23*, 427–442.

Durkin, K., Toseeb, U., Botting, N., Pickles, A., & Conti-Ramsden, G. (2017). Social confidence in early adulthood among young people with and without a history of language impairment. *Journal of Speech, Language, and Hearing Research, 60*, 1635–1647.

Eades, D. (2008). Telling and retelling your story in court: Questions, assumptions and intercultural implications. *Current Issues in Criminal Justice, 20*, 209–231.

Eades, D. (2012). Communication with Aboriginal speakers of English in the legal process. *Australian Journal of Linguistics, 32*, 473–489. https://doi.org/10.1080/07268602.2012.744268.

Fast, D. K., & Conry, J. (2009). Fetal alcohol spectrum disorders and the criminal justice system. *Developmental Disabilities Research Reviews, 15*, 250–257. https://doi.org/10.1002/ddrr.66.

Flannigan, K., Pei, J., Stewart, M., & Johnson, A. (2018). Fetal alcohol spectrum disorder and the criminal justice system: A systematic literature review. *International Journal of Law and Psychiatry, 57*, 42–52. https://doi.org/10.1016/j.ijlp.2017.12.008.

Freeman, L. A., & Staley, B. (2017). The positioning of Aboriginal students and their languages within Australia's education system: A human rights perspective. *International Journal of Speech-Language Pathology, 20*, 174–181. https://doi.org/10.1080/17549507.2018.1406003.

Gibson v The State of Western Australia (2017). WASCA 141. https://jade.io/article/542251/, Accessed date: 11 August 2018.

Gould, J. (2008). Non-standard assessment practices in the evaluation of communication in Australian Aboriginal children. *Clinical Linguistics and Phonology, 22*, 643–657. https://doi.org/10.1080/02699200802222206.

Government of Western Australia (2018a). Young Offenders Act 1994. https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_1101_homepage.html/, Accessed date: 10 July 2018.

Government of Western Australia (2018b). Evidence Act 1906. https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_312_homepage.html/, Accessed date: 19 September 2018.

Gregory, J., & Bryan, K. (2011). Speech and language therapy intervention with a group of persistent and prolific young offenders in a non-custodial setting with previously undiagnosed speech, language and communication difficulties. *International Journal of Language and Communication Disorders, 46*, 202–215. https://doi.org/10.3109/13682822.2010.490573.

Hand, L., Pickering, M., Kedge, S., & McCann, C. (2016). Oral language and communication factors to consider when supporting people with FASD involved with the legal system. In M. Nelson, & M. Trussler (Eds.). *Fetal alcohol spectrum disorders in adults: Ethical and legal perspectives* (pp. 139–147). Cham, Switzerland: Springer.

Helgesson, G., Bertilsson, G., Domeij, H., Fahlström, G., Heintz, E., Hjern, A., & Hultcrantz, M. (2018). Ethical aspects of diagnosis and interventions for children with fetal alcohol spectrum disorder (FASD) and their families. *BMC Medical Ethics, 19*, 1–7. https://doi.org/10.1186/s12910-017-0242-5.

Hopkins, T., Clegg, J., & Stackhouse, J. (2017). Examining the association between language, expository discourse and offending behaviour: An investigation of direction, strength and independence. *International Journal of Language and Communication Disorders, 53*, 113–129. https://doi.org/10.1111/1460-6984.12330.

Hudson, J. (1983). *Grammatical and semantic aspects of Fitzroy Valley Kriol. Vol. 8*. Western Australia: J. Hudson.

Hughes, N., Chitsabesan, P., Bryan, K., Borschmann, R., Swain, N., Lennox, C., & Shaw, J. (2017). Language impairment and comorbid vulnerabilities among young people in custody. *The Journal of Child Psychology and Psychiatry, 58*, 1106–1113. https://doi.org/10.1111/jcpp.12791.

Kinner, S. A., Degenhardt, L., Coffey, C., Sawyer, S., Hearps, S., & Patton, G. (2014). Complex health needs in the youth justice system: A survey of community-based and custodial offenders. *Journal of Adolescent Health, 54*, 521–526. https://doi.org/10.1016/j.jadohealth.2013.10.003.

Leitão, S. (2015). Interaction between speech, language and literacy. In S. McLeod, & J. McCormack (Eds.). *Introduction to speech, language and literacy*. Melbourne, Australia: Oxford University Press.

Li'el, N. (2017). Assessing dual language learners with primary language impairments: Developing an assessment approach. Master's thesis https://espace.curtin.edu.au/handle/20.500.11937/59687, Accessed date: 13 March 2018.

Lount, S. A., Hand, L., Purdy, S. C., & France, A. (2017). Tough talk: Youth offenders' perceptions of communicating in the youth justice system in New Zealand. *Australian and New Zealand Journal of Criminology, Early online,* 1–26. https://doi.org/10.1177/0004865817740404.

Malcolm, I. G. (2013). In B. Kortmann, & K. Lunkenheimer (Eds.). *Aboriginal English and associated varieties: Shared and unshared features* (pp. 596–619). Berlin, Germany: Mouton de Gruyter The Mouton world atlas of variation in English.

Martin, R. (2018). Just sentences: Human rights to enable participation and equity for prisoners and all. *International Journal of Speech-Language Pathology, 20*, 21–25 (17549507.2018.1422024).

McLeod, S., & McKinnon, D. H. (2007). Prevalence of communication disorders compared with other learning needs in 14,500 primary and secondary school students. *International Journal of Language and Communication Disorders, 42*, 37–59. https://doi.org/10.1080/13682820601173262.

Mutch, R. C., Jones, H. M., Bower, C., & Watkins, R. E. (2016). Fetal alcohol spectrum disorders: Using knowledge, attitudes and practice of justice professionals to support their educational needs. *Journal of Population Therapeutics and Clinical Pharmacology, 23*, e77–e89.

New South Wales Government (2017). *2015 Young people in custody health survey: Full report.* Malabar, Australia: Justice Health and Forensic Mental Health Network.

Paradis, J., Schneider, P., & Duncan, T. S. (2013). Discriminating children with language impairment among English-language learners from diverse first-language backgrounds. *Journal of Speech, Language, and Hearing Research, 56*, 971–981. https://doi.org/10.1044/1092-4388(2012/12-0050.

Passmore, H. M., Giglia, R., Watkins, R. E., Mutch, R. C., Marriott, R., Pestell, C., & Bower, C. (2016). Study protocol for screening and diagnosis of fetal alcohol spectrum disorders (FASD) among young people sentenced to detention in Western Australia. *British Medical Journal Open, 6*, e012184.

Pearce, W. M., & Williams, C. (2013). The cultural appropriateness and diagnostic usefulness of standardized language assessments for Indigenous Australian children. *International Journal of Speech-Language Pathology, 15*, 429–440. https://doi.org/10.3109/17549507.2012.762043.

Plotnikoff, J., & Woolfson, R. (2015). *Intermediaries in the criminal justice system: Improving communication for vulnerable witnesses and defendants.* Bristol, UK: Policy Press.

Popova, S., Lange, S., Shield, K., Mihic, A., Chudley, A. E., Mukherjee, R. A., & Rehm, J. (2016). Comorbidity of fetal alcohol spectrum disorder: A systematic review and meta-analysis. *The Lancet, 387*, 978–987. https://doi.org/10.1016/S0140-6736(15)01345-8.

Pora v The Queen (2015). NZPC 1 1; (2015) UKPC 7. https://www.jcpc.uk/cases/jcpc-2013-0081.html/, Accessed date: 10 August 2018.

Price, A., Cook, P. A., Norgate, S., & Mukherjee, R. (2017). Prenatal alcohol exposure and traumatic childhood experiences: A systematic review. *Neuroscience and Biobehavioral Reviews, 80*, 89–98. https://doi.org/10.1016/j.neubiorev.2017.05.018.

Proven, S., Ens, C., & Beaudin, P. G. (2014). The language profile of school-aged children with fetal alcohol spectrum disorder (FASD). *Canadian Journal of Speech-Language Pathology and Audiology, 37*, 268–279.

Ripley, K., & Yuill, N. (2005). Patterns of language impairment and behaviour in boys excluded from school. *British Journal of Educational Psychology, 75*, 37–50. https://doi.org/10.1348/000709905X27696.

Rogers, B. J., McLachlan, K., & Roesch, R. (2013). Resilience and enculturation: Strengths among young offenders with fetal alcohol spectrum disorder. *First Peoples Child and Family Review, 8*, 62–80.

Salmon, K., O'Kearney, R., Reese, E., & Fortune, C. (2016). The role of language skill in child psychopathology: Implications for intervention in the early years. *Clinical Child and Family Psychology Review, 19*, 352–367.

Salter, C. (2013). Conducting communication assessments with school aged aboriginal children in the Kimberley region of Australia. *Australian Review of Applied Linguistics, 36*, 316–334.

Semel, E., Wiig, E., & Secord, W. (2004). *Clinical evaluation of language fundamentals (4th edn), screening test, Australian and New Zealand language adapted edition.* Sydney, Australia: Pearson.

Semel, E., Wiig, E. H., & Secord, W. A. (2006). *Clinical evaluation of language fundamentals* (4th ed.). Sydney, Australia: Pearson.

Snow, P. C., Bagley, K., & White, D. (2017). Speech-language pathology intervention in a youth justice setting: Benefits perceived by staff extend beyond communication. *International Journal of Speech-Language Pathology, 20*, 458–467. https://doi.org/10.1080/17549507.2017.1297484.

Snow, P. C., & Powell, M. B. (2008). Oral language competence, social skills and high-risk boys: What are juvenile offenders trying to tell us? *Children and Society, 22*, 16–28. https://doi.org/10.1111/j.1099-0860.2006.00076.x.

Snow, P. C., & Powell, M. B. (2011). Oral language competence in incarcerated young offenders: Links with offending severity. *International Journal of Speech-Language Pathology, 13*, 480–489. https://doi.org/10.3109/17549507.2011.578661.

Snow, P. C., Powell, M. B., & Sanger, D. D. (2012). Oral language competence, young speakers, and the law. *Language, Speech, and Hearing Services in Schools, 43*, 496–506. https://doi.org/10.1044/0161-1461(2012/11-0065.

Snow, P. C., Woodward, M., Mathis, M., & Powell, M. B. (2016). Language functioning, mental health and alexithymia in incarcerated young offenders. *International Journal of Speech-Language Pathology, 18*, 20–31. https://doi.org/10.3109/17549507.2015.1081291.

Snow, P. C., & Woodward, M. N. (2016). Intervening to address communication difficulties in incarcerated youth: A phase 1 clinical trial. *International Journal of Speech-Language Pathology, 19*, 392–406. https://doi.org/10.1080/17549507.2016.1216600.

Snowling, M. J., Bishop, D. V., Stothard, S. E., Chipchase, B., & Kaplan, C. (2006). Psychosocial outcomes at 15 years of children with a preschool history of speech-language impairment. *Journal of Child Psychology and Psychiatry, 47*, 759–765. https://doi.org/10.1111/j.1469-7610.2006.01631.x.

Stewart, J., Woodward, M., & Hepner, F. (2015). Fitness to stand trial, human rights and possibilities from England and Wales. *Journal of Law and Medicine, 22*, 886–899.

Streissguth, A. P., Bookstein, F. L., Barr, H. M., Sampson, P. D., O'Malley, K., & Young, J. K. (2004). Risk factors for adverse life outcomes in fetal alcohol syndrome and fetal alcohol effects. *Developmental and Behavioural Pediatrics, 25*, 228–238. https://doi.org/10.1097/00004703-200408000-00002.

Talking Trouble Aotearoa New Zealand (2018). Specialised communication assistance in justice contexts. http://talkingtroublenz.org/specialised-communication-assistance-in-justice-contexts/, Accessed date: 27 August 2018.

Webb, G. L., & Williams, C. J. (2018). Factors affecting language and literacy development in Australian Aboriginal children: Considering dialect, culture and health. *Journal of Early Childhood Research, 16*, 104–116. https://doi.org/10.1177/1476718X17693417.

Wechsler, D. (2011). *Wechsler abbreviated scale of intelligence* (2nd ed.). Bloomington, USA: Pearson.

Wechsler, D., & Naglieri, J. A. (2006). *Wechsler nonverbal scale of ability.* San Antonio, USA: Harcourt Assessment.