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Investigating the Bilingual 'Catch-up' in Welsh-English Bilingual Teenagers

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Investigating the Bilingual ‘Catch-up’ in Welsh-English Bilingual Teenagers

Hanna Louise Binks

Bangor University

PhD 2017

Abstract

Previous research has identified linguistic differences within Welsh-English bilingual children from predominantly English homes and homes where both Welsh and English were spoken are found to lag behind L1 Welsh children from Welsh speaking households on measures of Grammatical Gender (Gathercole & Thomas, 2009); Plural Morphology (Thomas, Williams, Jones, Davies & Binks, 2014); and Welsh vocabulary (Rhys & Thomas, 2013). This thesis aimed to establish the factors that could influence whether 2L1 and L2 Welsh bilingual children eventually reach comparable attainment levels or ‘catch-up’ to that of their L1 Welsh peers in their command of Welsh.

Three experiments assessed participants aged 12-13 and 16-17 from different language backgrounds on their knowledge of Grammatical Gender; Plural Morphology; Welsh vocabulary, and English vocabulary. The data obtained indicated that there was a ‘catch-up’ within the 12-13 participants on measures of vocabulary and Gender; however, L2 Welsh bilinguals still lagged behind on measures of Plural Morphology. The ‘catch-up’ was not seen within the older 16-17 participants. A fourth experiment investigated how the participants, use of Welsh, attitude towards Welsh, and their confidence using Welsh influenced their overall competence on these linguistic measures. Results revealed no correlation between attitude and participants success on each test. However, there was a correlation between the participants’ use of Welsh and their knowledge of Welsh, yet it did not contribute to higher scores. Confidence in using Welsh was revealed to be the sole predictive factor in participants’ success on each test.

*“Two languages in one head?
No one can live at that speed!
Good lord, man. You’re asking the impossible,”*
- Eddie Izzard

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List of Abbreviations

L1	First Language
L2	Second Language
L1W	First Language Welsh Bilinguals
2L1	Simultaneous Welsh-English Bilinguals
L2W	Second Language Welsh Bilinguals
AoO	Age of Onset
MLU	Mean Length of Utterance
SES	Socio-Economic Status
SM	Soft Mutation
AM	Aspirate Mutation
NM	Nasal Mutation
CAT -4	Cognitive Abilities Test: Fourth Edition
PGG-4	Prawf Gallu Gwybyddol 4: Argraffiad Cymraeg (CAT-4 Welsh Adaptation)
UoW	Overall Use of Welsh
WwF	Use of Welsh with Friends

Chapter 1: Introduction to the Thesis

A wealth of research to date has investigated how children learn language. Many have established the essential role of linguistic input in successful language acquisition (Gathercole, 2016). With past research establishing the importance of quantity of input (e.g. Gathercole, 1997; Gathercole & Thomas, 2009; Hart & Risley, 1995), quality of input (Unsworth, 2008), the frequency and complexity of linguistic structures (Ambridge, Kidd, Rowland & Theakston, 2015) and the overall variation in their language environment on child language acquisition (Paradis & Grüter, 2014; Paradis & Jia, 2016). However, few studies have focused primarily on the effects that these factors have on the ultimate attainment possible in a language learned under minority language conditions (however see e.g. Gathercole & Thomas, 2009)¹.

Linguistic input does not guarantee speedy acquisition of language however. Even within the context of English language learning, studies show that after years of exposure to English as an L2 at school, children may still lag behind monolinguals on measures of morphology and vocabulary (e.g. Cobo-Lewis, Pearson, Eilers & Umbel, 2002; Paradis, Genesee & Crago, 2011). Whilst it is reasonable to expect differences across bilinguals and monolinguals at certain points in development, it remains unclear as to how long it will take before a bilingual child becomes fluent in both languages. I.e. before they ‘catch up’ with monolingual peers or with age-matched (near-)native bilingual speakers of the language (if

¹ Throughout this thesis, both ‘acquisition’ and ‘learning’ are used in the context of language development. ‘Acquisition’ is used primarily in relation to individuals who are learning one or two languages from birth or as early sequential bilinguals (i.e., when exposed to a second language within the first 6 years of life). The term ‘learning’ is used primarily in relation to contexts where individuals are learning a language either as an academic subject or much later on in their lives (e.g., when first exposure is during late childhood/teenage years or adulthood). The three language groups involved in this thesis are labelled L1 Welsh bilinguals, 2L1 Welsh-English bilinguals and L2 Welsh bilinguals to follow the usual convention in psycholinguistic literature. However, all children attended Welsh-medium/bilingual education, and were therefore exposed to both languages before age 4 years and are therefore still acquiring the languages.

they do at all), with limited amounts of studies to date addressing this issue (Paradis & Jia, 2016; Paradis, Tulpar & Arppe, 2016). Fewer still have addressed this ‘catch-up’ from a minority language context, looking specifically at within-bilingual differences rather than a comparison against a monolingual population.

Previous research on Welsh has found that children learning Welsh as an L2, and even simultaneous bilingual children who hear and speak both Welsh and English in the home (2L1) from birth, lag behind L1 Welsh-speaking children at age 11 on various linguistic constructs (Thomas & Gathercole, 2007; Gathercole & Thomas, 2009). The question to address here is to what extent, and under what circumstances, these 2L1 and L2 Welsh children are able to ‘catch-up’ with their L1 Welsh-speaking peers and whether there are any social factors that interfere with their ‘ultimate attainment’ of Welsh. L1 speakers in these studies were classed as those raised in homes where both parents spoke Welsh with the child; 2L1 were classed as those raised in homes where one parent spoke Welsh with the child, the other English; and L2 Welsh were classed as children raised in homes where both parents spoke English with the child. This topic is a highly relevant one that new studies are beginning to address within in the context of monolinguals vs. bilinguals and answers to this question are important since perceived self-ability of linguistic knowledge is linked to speakers’ attitude and willingness to use the language (Paradis and Jia, 2016). However, studies looking at the application of this ‘catch up’ to within-bilingual differences in a minority language context is limited.

Given the variation in children’s linguistic experiences, the relative amount of input that bilinguals receive can change depending on social and/or educational factors. Whilst previous studies of Welsh have demonstrated large differences in children’s productions of certain aspects of linguistic knowledge depending on their home language experiences, most of those studies have looked at children up to the age of 9 years or 11 years. What is

unknown is to what extent knowledge is gained as children become older and at what point (if any), children's abilities plateau across home language types, either in spoken language or in written form. Furthermore, research on whether or not sociological factors such as attitude, language confidence, and language use influences children's ultimate attainment of language is limited. As sociological factors have the potential to influence the attainment progression of Welsh within bilinguals (Carroll, 2015; Montrul, 2008), whether or not a 'catch-up' occurs may be due to a combination of sociolinguistic and input related factors (see chapter 6). Since the focus of the present study will be on the factors that influence bilingual teenagers' acquisition of Welsh, the next section will provide a quick overview of the important factors that need to be considered when discussing the Welsh language context.

1.1 The Welsh Language

As reported in the most recent census, approximately 19% (562,000) of the population of Wales (totalling around 3.1 million) speak Welsh (ONS, 2011). Such figures mark Welsh as a minority language in Wales². This is a decrease from the figures published in 2001, where the number of speakers was 21% (ONS, 2001), most notably due to a decrease in speakers in the 'Welsh' heartlands (Coupland et al., 2005). These Welsh heartland areas- such as Gwynedd where 65% of inhabitants over the age of 3 are reported to be able to speak Welsh; Isle of Anglesey- where 57.2% speak Welsh; Ceredigion- where 47.3% speak Welsh; and Carmarthenshire- where 43.9% speak Welsh- have seen a decrease in numbers over the last 10 years (ONS, 2011). With speaker numbers in counties such as Carmarthen and Ceredigion decreasing by 6.4% and 4.1% from 2001, making Welsh the minority language in these traditionally dominant Welsh-language areas³.

² There are, of course, areas where Welsh speakers are in the majority (over 50% of their respective populations speak Welsh), and where Welsh will be a child's stronger, first language, but these areas are in the minority across Wales.

³ However, there are areas within these counties where Welsh is the majority community language. For example, within Ceredigion, 66.9% of inhabitants within the area of Tregaron speak Welsh, in comparison to areas in central Aberystwyth where 24.4% speak Welsh. Conversely, within the county of Gwynedd where

While a decrease in speaker numbers is particularly worrying for the sustainable future of a minority language, an increase seen in some of the more Anglicised and urban areas was also reported. Areas such as Cardiff saw an increase of 0.1%, most likely due to the influence of Welsh medium education (Roberts, 2009), as well as the migration of individuals from traditionally Welsh-speaking rural areas to more Anglicised urban ones. Such increases are often the result of governmental initiatives and legislation that build upon one another to facilitate and support the use and availability of the language, increasing its accessibility and speaker rights. For example, the 1967 Welsh Language Act gave some rights to use the Welsh language in legal proceedings and gave the right for some ministers to produce Welsh language version of documents. These rights were expanded in 1993, to give Welsh equal status to English within the public sector, although services within the sector, in general, were slow to honour this standing for the language. The development of *Mentrau Iaith* (Language Ventures) and *TWF* (Transmission within Families), with financial support by the Welsh Government, focused on developing the use of Welsh in the general community and within families, and the creation of *Iaith Pawb – A National Action Plan for a Bilingual Wales* (2003) provided a vision that helped guide the work of such initiatives. Welsh became an official language in Wales in 2011, and *A living language: a language for living - Welsh language strategy 2012 to 2017*, along with the *Welsh-medium Education Strategy (2010)*, provided ‘a range of measures aimed at promoting increased language acquisition and language use’ (p.4). The Welsh Language Standards (2016) shifted the focus onto the consumer, giving people the right to access services in Welsh (Welsh Government, 2016). However, regardless of all efforts, English continues to dominate as the *de facto* language in

Welsh is a majority language, there are communities where Welsh is a minority, e.g. Aberdyfi where 35.5% of the population speak Welsh – which contrast with other communities such as Llanrug, where 87.8% speak Welsh (ONS, 2011).

many domains (Davies, 2014), with all Welsh speakers (bar very young children), being able to speak both English and Welsh (ONS, 2011).

Welsh as a minority alongside English, the majority language, has led to a fear that Welsh is undergoing a linguistic convergence at the level of morphology, syntax, and the lexicon as a result of close contact with English (Thomas, 1982; Philipps, 2008; Jones, 1998), although, Davies and Deuchar (2010) have debated the extent of any such change. Regardless of the extent of the influence one language has on another, studies have reported a negative attitude towards linguistic transfer from English into Welsh (Roberts, 2011; Davies, 2010). Some Welsh speakers judge negatively those individuals who use English elements within Welsh sentence structures (Roberts, 2009), whilst some individual activist groups even campaign against what is perceived to be the ‘Anglicisation’ of Welsh in the media (Prys, 2016). This strong negative feeling against lexical borrowings and code-switching may influence the take up and use of Welsh by young L2, and possibly even L1, speakers of Welsh (see. Chapter 6). For this reason, the present thesis included data on participants’ attitudes towards Welsh, English and bilingualism as well as information about their use of both languages in various domains and with various speakers in order to explore the role of a variety of variables on speakers’ performance on linguistic tasks.

1.2 *Welsh-Medium Education*

The overall amount of exposure a child has to Welsh will vary greatly from one region to the next. Larger proportions of speakers are reported as residing in the West, with far fewer speakers of Welsh (in proportion to the population) residing in the East (Welsh Government, 2012). Therefore, depending on the region in which a child resides, a child is likely to receive more exposure to Welsh in a predominantly Welsh speaking community in comparison to a predominantly English speaking community. In English-dominant communities, L2 speakers of Welsh are likely to receive their greatest exposure to Welsh

through education. The 1988 Education Act made Welsh a compulsory subject in all secondary schools up to age 16 after which it becomes an elective subject. All other schools in Wales are required to teach Welsh as an L2 (Welsh Government, 2013). In 2009, 29% of primary schools were Welsh-medium, with 21%⁴ primary aged children taught through the medium of Welsh, with Welsh as the main language of instruction, with 25% of secondary schools teaching Welsh medium lessons (Welsh Government, 2010). In their attempts to reach a million Welsh-language speakers by 2050 (Cymraeg 2050: Welsh Language Strategy), the Welsh Government seeks to increase the number of children in Welsh-medium primary education to 40% with local authorities attempting to strengthen their Welsh-language policies in regards to education in line with the demand from parents/cares (Welsh Government, 2017).

However, how much is taught through the medium of Welsh varies from school to school (Baker, 1993), with provision dependent on the sociolinguistic demographics of that area (Jones, 1998). For example, in Gwynedd, the county with the highest percentage of Welsh speakers, all primary schools run by the Local Authority are Welsh medium⁵; that is, at least 70% of children in the foundation phase study subjects through the medium of Welsh (Gwynedd Council, 2016). However, this is not the case for other Welsh regions. Some schools (most often temporarily) are transitional schools, where both languages are used, however in 70% of the curriculum, the emphasis is on Welsh. It is also possible to have English-medium primary schools, where English is the predominant language of the school, with less than 20% of subjects is through the medium of Welsh and Welsh is taught as an L2. Dual-stream schools provide side-by-side Welsh and English provisions, with the education

⁴ This number has increased to 22% based on seven year-olds in 2015/16 (Welsh Government, 2017)

⁵ This excludes any private or religious schools.

being through the medium of Welsh in the Welsh stream, with the English stream being predominantly English-medium (Welsh Government, 2007; 2016).

Secondary schools that are categorised as being Welsh-medium are ones where all subjects, bar English, are through the medium of Welsh. In English-medium schools, subjects are taught predominantly in English and Welsh is taught as an L2. Predominantly English-medium schools too normally teach through the medium of English however, between 20-49% of subjects can be taught through the medium of Welsh, with both languages used for communication and administration. Bilingual secondary schools range in their provision and are categorised as follows (Welsh Government, 2016):

Type A: at least 80% of subjects, apart from Welsh and English, are taught through the medium of Welsh. One or two subjects are taught to some students through the medium of English or in both languages.

Type B: at least 80% of subjects, apart from Welsh and English, are taught through the medium of Welsh, but are also taught through the medium of English.

Type C: 50-79% of subjects, apart from Welsh and English, are taught through the medium of Welsh, but are also taught through the medium of English.

Type Ch: all subjects, except Welsh and English, are taught to all pupils using both languages.

While, bilingual and Welsh-medium schools tend to give a high priority to creating a ‘Welsh ethos’, the day-to-day communication within the school is determined by its linguistic context (Welsh Government, 2016), Exposure to Welsh on a daily basis, therefore can, vary drastically from school area to the next.

Although, immersion education has been considered an effective way of enabling successful acquisition of minority languages in particular (Baker & Prys, 1998), students’ linguistic outcomes can vary depending on provision, particularly when linguistic skills in a

minority language such as Welsh are not reinforced outside of the school (Welsh Government, 2010). Regardless of this knowledge, children of all linguistic backgrounds attending predominantly Welsh-medium or immersion schools are expected to have a sound grasp of the Welsh language and its syntax, use a range of verb forms purposefully, negate sentences, conjugate prepositions, differentiate between similar words, and use noun gender and a range of mutations appropriately in context by the end of Key Stage 4 (Welsh Government, 2015). Whether or not this is a realistic expectation (particularly in the context of this thesis) is discussed in Chapter 7.

1.3 Sources of Welsh Input

It is important to note that L1 speakers of Welsh, whilst receiving ample exposure to Welsh at home and at school, might only receive exposure to standard forms of Welsh through the medium of education. This includes exposure to certain grammatical structures that may not appear regularly in oral speech. Other sources of input include Welsh-medium media such as *S4C* and *BBC Radio Cymru*, which provide considerable sources of exposure to an oral form of Welsh for both L1 and L2 speakers (see Williams & Thomas, 2017), although it is uncertain to which extent children, teenagers especially engage with Welsh in these formats. While *S4C* recently launched an online channel called *Pump* “five” aimed at young people, it is too early to tell how successful it will be in encouraging teenagers – especially L2 speakers – to engage with the language or whether it will succeed in normalizing Welsh and promoting its use within the younger generation of speakers. Again, such issues are of importance to the current study since engagement with these mediums may influence linguistic performance.

1.4 Study Aims

Therefore, children learning Welsh are challenged by the varying nature of the language itself under the influence of English, and access to input due to its minority

language status. This thesis will primarily investigate, while working under a non-generativist framework, how older children receiving different amounts of input perform on tasks measuring Welsh vocabulary and morphology with a view to providing recommendations that can help policy planners cater for the needs of those learning the minority language (Gernoble & Whaley, 2006). The studies conducted within this thesis provide useful information regarding the long-term outcomes of L2 Welsh learners across different language domains, how input shapes this ‘catch-up’ in a minority language context and how education policy can adapt to support this.

This thesis will be looking at the acquisition of Welsh and English vocabulary and Welsh morphology, specifically examining teenagers’ use of the Welsh plural and gender system. Previous research has assessed children aged 7-11 attainment of these structures has found continuing attainment differences between children from different bilingual groups (Gathercole & Thomas, 2009; Thomas, Williams, Jones, Davies & Binks, 2014). In order to assess whether increased input over time leads to a ‘catch-up’, the thesis shall be comparing the results of those who have had longer exposure to Welsh, that is, more years of Welsh medium education to establish if the L2 Welsh speakers and 2L1 Welsh speakers converge with the L1s within a certain time frame. This thesis will also go on to combine scores on morphological and vocabulary tests with measures of social use and attitude towards Welsh with the aim of establishing any relationship between social aspects and attainment.

1.5 *Thesis Outline*

The thesis is organised as follows: Chapter 2 addresses the research available on child language acquisition, specifically on the acquisition of morphology and vocabulary. This chapter will also discuss how input influences this idea of ‘catch-up’. Chapter 3 provides a description of the Welsh grammatical gender system and presents the results from the first study, a gender comprehension experiment. Chapter 4 provides a description on the Welsh

plural system and the results of the second study, the plural production experiment. Chapter 5 will present results from two experiments, a verbal analogies test and a verbal categorisation test, both of which assessed receptive vocabulary. Chapter 6 will draw on the literature in the field of sociolinguistic to discuss how attitudes to language and teenagers' overall language use can influence attainment levels and will present results from the language use and attitudes questionnaire, combining results from the previous chapters to establish the relationship between attitudes and use and overall attainment. Chapter 7 will draw together the results from chapters 3, 4, 5, and 6 and draw from discussions of the findings any specific implications for theory and practice.

Chapter 2: Linguistic Input and Bilingual Development

The extent to which linguistic input (in its many guises) influences language acquisition is repeatedly debated in the child language literature. Those favouring a generativist explanation seem to suggest, as a general belief, that children must be equipped with innate linguistic knowledge for them to be able to successfully construct language. In their view, input is considered an inadequate source of linguistic information by itself and has minor influence on language acquisition, used only to induce the application of a particular linguistic structure, and having little impact on the speed and sequence of acquisition (e.g. Chomsky, 1965). Research operating within the nativist approach has suggested that bilinguals do not suffer any language delay as compared to monolinguals, reaching the same development milestones at the same time (Gleitman & Newport, 1995) with bilinguals acquiring both languages at a similar speed to monolinguals (Kovács & Mehler, 2009). A statement that may not necessarily be the case, as will be discussed in further detail later in this chapter.

Alternative, non-generativist, ‘cognitive’ accounts, such as the usage-based and constructivist approaches, suggest that input plays a much more significant role. Common to both approaches is the argument that input influences factors such as the speed at which children construct grammar, and how successful they are at acquiring certain linguistic forms (Gathercole & Hoff, 2007; Tomasello, 2003; Lieven & Tomasello, 2008), without relying on innate knowledge or mechanisms, relying instead on domain general, social and cognitive mechanisms (O’Grady, 2008). Those favouring a usage-based approach believe that children attain grammar through interactions with their environment (MacWhinney & Bates, 1989, Budwig, 1995), with language structure emerging from language use (Tomasello, 2002). This is apparent at individual word level, with communicative functions deriving from their use, and can be seen at the level of grammar, with grammatical structures emerging from patterns of use of multi-unit utterances (Tomasello, 2002).

Those favouring a constructivist account of language acquisition agree that language is derived and shaped from the particular linguistic interactions that are available to a child, and these opportunities lead to certain principles that lie as a basis for acquisition:

- (i) **Piecemeal acquisition:** Children acquire aspects of their language in a piecemeal fashion (e.g., Gathercole, 2007; Thomas & Gathercole, 2007), rather than through a systematic extraction of the rules.
- (ii) **Acquisition in context:** Linguistic knowledge is initially embedded within both situational and real-life contexts in addition to the linguistic context where linguistic items are experienced (Gathercole, Pérez-Tattam, Stadthagen-González, and Thomas 2014). This means that children will have to abstract out the general patterns from different contexts to be able to apply them in a novel situations (Gathercole, 2007).
- (iii) **Emergence of structure from accumulated knowledge:** Children accumulate more piecemeal knowledge and begin to form interconnecting links. Eventually, once a Critical Mass of exposure has been accumulated (see p.41 below), children's language structure emerge from this accumulated knowledge leading to reorganisation and higher-level abstractions of linguistic knowledge (Gathercole, 2007).
- (iv) **Influence of language on timing and sequence of acquisition:** Properties of the language acquired can influence the pattern and timing of acquisition (Gathercole, 2007). Languages with complex and opaque form function mappings, such as grammatical gender in Welsh (see Chapter 3) are generally harder to acquire than transparent forms.

- (v) Amount of exposure affects timing of development: The level of exposure a child receives to a particular language or grammatical structure can affect the rate and accuracy that is acquired (Gathercole, 2007).

In the case of bilingual acquisition, these principles are as applicable for bilingual development as for monolingual development. However, bilingual development deviates from monolingual development in that bilingual children receive input from more than one language, in largely different contexts (Gathercole, 2007). Therefore, if one (or both) languages have complex grammatical properties, or if exposure to a given language is limited to certain contexts, certain aspects of that language could take much longer for a bilingual to acquire (if acquired at all) in comparison to a monolingual (a factor that will be discussed in more detail further on in this chapter).

The constructivist view has been explored extensively in the bilingual acquisition literature, and it will be this approach that will be adopted throughout this thesis. This chapter begins with a discussion of early language experiences such as the relationship between Age of Onset and overall language attainment, followed by an overview of the literature linking input and exposure to the acquisition of vocabulary and morphology, culminating in the various factors that affect language acquisition, including quantity of input and the qualitative features of individuals' experience.

2.1 Age of Onset and a Critical Period

Early language experience has been found to contribute greatly to the expected language growth and outcomes in monolingual children (Hoff, 2003; Hart & Risley, 1995; Maratsos, 2000; Gathercole, Sebastián & Soto, 1999) with most research suggesting a strong link between the frequency of exposure and linguistic development, particularly during the early foundation years of learning.

Some researchers have claimed that the optimum age for acquiring aspects of morphosyntax is at age 4 (Meisel, 2009), meaning that attempts at learning those aspects beyond that age may lead to less favourable outcomes. In the same way, researchers have suggested that children who are exposed to an L2 at an early age are more likely to become fully bilingual, attaining native-like language competence in both of their languages than those whose first exposure to the language happens at a later stage (Reich, 1986; DeKeyser, 2012).

Studies comparing the Age of Onset (AoO) of L2 learning –i.e. the various stages during childhood when children were exposed to their L2 vs. adult L2 learning – and their overall native-like proficiency in their L2 have largely supported this notion (DeKeyser, 2012). Positive correlations have been found between late AoO and low language proficiency (Weber-Fox & Neville, 2001), which suggests that early exposure is likely to lead to better outcomes than later exposure, especially in the context of ‘native-like abilities’. However, ‘earlier, the better’ may not necessarily be a blanket rule, with studies such as Abrahamsson and Hyltenstam (2009) finding that adults who learnt their L2 during childhood do not always possess native-like pronunciation and grammar in their L2, a finding that has some similarities with studies of L2 Welsh proficiency among children here in Wales (see Chapters 3-5). Such observations give rise to the question as to whether language learning is ruled by maturational constraints (Lenneberg, 1967) such as a critical (or, more recently accepted ‘sensitive’) period for language acquisition. The core argument proposed is that after a certain point in human development it may not be possible to attain native-like competence in a language with ease due to maturational constraints affecting neurological development (Johnson & Newport, 1991; Birdsong, 1999), an argument that relies on an assumption that language knowledge is biologically ingrained.

How and why AoO may impact L2 acquisition, whether maturational constraints equal a specific ‘cut-off’ point for ease of acquisition, or whether AoO effects continue over an individual’s lifespan (Paradis, Tulpar, & Arppe, 2016; Tsimpli, 2014; DeKeyser, 2012) continues to be debated in the literature. What is clear, however, is that whether a sensitive period exists or not, studies have found adult learners able to achieve native-like competence outside the ‘period’ (Birdsong, 1999) and thus there must be other factors beyond AoO at play. Indeed, Long (1990) argues that any ‘proof’ of a critical period for L2 acquisition is falsified by the existence of late adult bilinguals who have achieved native-like attainment in their L2.

However, the fact remains that many studies have found that adults, who started learning their L2 in early childhood, fail to reach ultimate, native-like attainment (Hakuta, Bialystok & Wiley, 2003; Weber-Fox & Neville, 1999). For example, Abrahamsson and Hyltenstam (2009) found non-native differences in Swedish grammar and pronunciation of Spanish L1-Swedish L2 bilinguals, who had started learning Swedish at different ages. They found that even those who started learning Swedish before the age of five spoke/performed different from native L1 Swedes, with discrepancies increasing with AoO. Similarly, Flege, Yeni-Komishan and Liu (1999) observed pronunciation inconsistencies between Korean immigrants to the USA. They found a strong correlation between the participants’ AoO of English and the strength of their foreign accent, while their judgement of morphosyntax was less affected by AoO, suggesting that phonology is more constrained by AoO than morphosyntax (Cook, 1992). As stated by Montrul (2008 p.94)

“Native-like competence and performance are not always guaranteed, and age of acquisition is often found to be the strongest predictor of native-like ultimate attainment by adults, with empirical evidence consistently producing a strong main effect for age extending throughout an individual’s life span, beyond puberty and not ruled by a critical period”

Nevertheless, whilst the majority of studies looking at the influence of AoO on language development typically compare child language development with adult language learning, interesting differences are also found among children. Jia and Fuse (2007) found Chinese L1 children with earlier AoO for English as an L2 demonstrated higher accuracy with verb morphology than those with later AoO for English. The participants in this study also displayed an asymptote in development after four to five years of exposure; similar findings were found in L1 Turkish-L2 English bilingual children, with verb inflection accuracy close to native-like competencies after six years of exposure (Marinis & Chondrogianni, 2010). Conversely, Unsworth (2016) observed when investigating L1 English children with different AoO for Dutch ($AoO < 4$; $AoO \geq 4$), that there were no significant differences between the two groups in their performance on semantics, verb morphology and morphosyntax. However, while there were no age effects there were input effects, which accounted for the variance in the children's responses.

Recent studies looking at children's acquisition of Welsh show that at age 11 differences remain prevalent between 2L1 and L1 bilinguals who have all been exposed to both languages from birth (Gathercole & Thomas, 2005; Thomas, Williams, Jones, Davies & Binks, 2014), suggesting, like Unsworth (2016), that AoO is not a clear determiner of language fluency. Similarly, Unsworth's (2008) study showed adult L2 speakers with a similar length of exposure to Dutch as the L2 children were scoring consistently higher on diminutives and non-derived nouns as compared with the L2 children. This provides further evidence that other factors such as cognitive maturity can effect language acquisition and that AoO is not a concrete determiner of linguistic success by itself.

Thus, it is likely that the younger the AoO for an L2 the more native-like an individual's acquisition of that language is likely to be. However, there are other influential factors that can affect speakers' ultimate attainment; these include different environmental

input factors such as how frequent the L1 and L2 are heard and used (Bialystok & Hakuta, 1999; Bialystok & Miller, 1999) and how native-like that input may be. Together, age affects and input frequency can influence ultimate attainment of language, although studies tend to explore each factor independently.

2.2 *Input Frequency and Language Acquisition.*

The influential study by Hart and Risley (1995) discovered correlations between the rates of speech exposed to and the average words produced by monolingual three-year-old children. Children exposed to higher rates of speech produced more words. It is a logical assumption that this relationship between exposure rates and linguistic outcomes will also be relevant to bilingual development since the sequence of bilingual language development is similar to that observed in monolingual development. That bilingual children acquire both languages largely independently (Döpke, 1997, 2000) but with various degrees of transfer (Hulk & Muller, 2000; Kupisch & Bernardini, 2007). Although the notion that bilingual children develop languages as separate entities, akin to two monolinguals in one, is largely contested (Grosjean, 1989). Bilingual development is therefore likely to be affected by variation in linguistic environments in the same way as monolinguals.

It is inevitable that bilingual children are almost always exposed to less input in any one language when compared with monolingual children (Paradis & Genesee, 1996). One reason for this is that bilingual children (in comparison to monolinguals) will experience a variety of exposure rates in any one language as compared to the other. Pearson, Fernandez, Lewedeg and Oller (1997) found that Spanish-English bilingual children produced more words in the language they heard most often, and the proportion of time they heard each language and their subsequent development was correlated. This link between frequency of input and language development has been widely reported in the literature, with Rieckborn (2006) finding correlations between German-French bilinguals' use of German past tense

verbs and their frequency in the input. Also, De Houwer (1997) found similar correlations between input frequency and children's acquisition of past tense verbs in English and Dutch (similar findings are also reported in Oller, Eilers, Urbano & Cobo-Lewis 1997; Hurtado, Grüter, Marchman & Fernald 2014; Chan & Nicoladis, 2010; Petitto & Kovelman, 2003 and Hoff et. al. 2012, among others).

However, assessing how much input a child receives in any one language is a difficult task. Whilst it is logical to assume that bilingual children have less exposure to each language compared with monolinguals, they may not necessarily receive less overall input, given the variation found in parental speech (Hart & Risley, 1995). Research by De Houwer (2014) found that when comparing the amount of maternal input to bilingual children and monolingual children, there was variation in the rate of maternal speech that both groups of children received. This suggests that a bilingual child can still receive more input to a given language than a monolingual child, if the speech rate that he/she is exposed to is higher. These differences may relate to how the languages are presented to the child – whether the family involved operates a ‘one parent-one language’ model, and with which parent the child spends most time, or whether the child hears one language in the home environment and another language in the wider environment, etc. That said, the majority of the research has demonstrated differences in rates of development in bilinguals with various language exposure patterns for both vocabulary and grammar, which will be discussed next in this chapter.

2.2.1 Input and Vocabulary Acquisition

Clear links have been demonstrated quite strongly in the literature between vocabulary development and linguistic exposure (Gathercole, 2007a; Hart & Risley, 1995). Vocabulary is largely believed to be acquired ‘item-by-item’ and exposure to language is particularly important to its development (Oller et al, 2007; Paradis & Genesee, 1996). For

example, results from Pearson et al.'s (1997) study indicated a strong relationship between the amount of input a child received and their vocabulary size. Using the MacArthur Communicative Development Inventories (CDI) for an estimate of vocabulary size, they found in simultaneous Spanish-English bilingual children aged 8-30 months that the percentage of all the words known in each language was correlated with the estimated amount of linguistic input they received.

Further studies have also shown that bilinguals perform below the (monolingual) age-based norms on receptive vocabulary (i.e. comprehension of words) in either one of their languages (Allman, 2005; Bialystok, Craik & Luk, 2008; Bialystok, Luk, Peets & Yang 2010) or in both languages (Oller, 2005; Uchikoshi 2006). Even in contexts when they are allowed to use both languages, bilinguals will typically lag behind monolinguals (Gollan, Montoya & Werner, 2002). A recent study by Hoff, Welsh, Place and Ribot (2014) found that young simultaneous bilingual children who receive a varied amount of exposure to their language combinations typically have smaller vocabularies than monolinguals (see also Thordardottir, Rothenberg, Rivard & Naves, 2006, and Hoff et al. 2012 for similar results). Rosselli, et al. (2000) also found that in comparison to English monolinguals, Spanish-English bilinguals produce fewer words in verbal fluency tasks and had longer response times. Likewise, Bialystok, et al. (2010), using the PPVT-III, found bilingual children aged 3-10 had smaller English receptive vocabulary when compared with monolinguals. These performance differences have been seen at age 3-5 years (Allman, 2005), 6-10 years (Bialystok, et al., 2010), also in later childhood (Oller, Cobo-Lewis & Pearson, 2007). These differences can also be found in adult bilinguals, with monolinguals still having significantly higher receptive vocabulary skills in comparison to bilinguals (Bialystok & Luk, 2012).

However, the lower than average levels of exposure bilinguals receive in each language has been proposed as a basis for an explanation for these differences (Paradis &

Genesee, 1996). It is worth noting, however, that regardless of the overwhelming research in support of this claim, some studies have found no such differences. Thordardottir (2011) found no receptive vocabulary deficits in French-English bilingual children in comparison to their monolingual peers; the explanation for these results was suggested to be the location of the sample. Most of the aforementioned studies were conducted in the USA, whereas Thordardottir's study was conducted in Montréal Canada, where both French and English are supported languages (both educationally and culturally). Therefore, children who were equally exposed to French and English did not differ from monolinguals because of the *"favourable language learning environment for French and English"* (p.426), which suggests that under certain (socio-)linguistic conditions, the acquisition of vocabulary in both languages can be supported.

It is important to highlight that any differences found between speakers do not necessarily indicate a lack of linguistic competence in each language. On the contrary, differences between monolinguals and bilinguals are a likely consequence of the so-called 'distributed characteristic' of the bilingual (Oller, 2005), or what Grosjean (2008) refers to as the 'Complimentary Principle'. The distributed characteristic refers to the fact that bilinguals, unlike monolinguals, must distribute their knowledge and 'time on task' across two languages. This occurs when one language is used and heard more in some domains than in others which causes the language to become domain specific (Li & Munby, 1996), leading to context-specific lexicons with individual vocabulary items developing differently depending on the context (Oller, 2005). The above notion is supported by Bialystok and Luk (2012), who suggested that the lower bilingual scores they found among adults did not necessarily mean that bilinguals knew fewer words in total compared with their monolingual peers; it simply meant that they knew fewer words in any one of their languages. That is, bilinguals may have labels to refer to objects and entities in any one language, but not necessarily a

label for all objects and entities they want or need to express in both languages during all stages of their development. As bilinguals have more diverse language backgrounds, with their languages being learnt at different ages, under different conditions, and in different domains, we cannot expect bilinguals to acquire balanced vocabularies in both languages at the same rates as monolinguals do in one.

Having their linguistic knowledge spread across languages and situations in turn affects bilinguals' 'measured' proficiency in any one language. In fact, Pearson (2007) found that when testing bilingual children in their two languages, they had a higher overall vocabulary than monolinguals. These findings supported an earlier study by Pearson, Fernandez and Oller (1993) that compared monolingual and bilingual toddlers using the CDI, where parents were asked to note both productive and receptive words. Results showed that bilingual children's development of early vocabulary was not necessarily slower than monolinguals. They found no deficits in receptive vocabulary but discovered that input was linked to the children's productive vocabulary (i.e. the number of words they produced). In the numerous examples of studies that have found deficits in bilingual children's vocabulary in comparison to their monolingual peers (Ben-Zeev, 1977; Rosenblum & Pinker, 1983). These more recent studies assessing the overall amount of words produced in both languages support this notion of 'distributed characteristic' and that bilinguals' overall knowledge of words across both languages may equal or surpass that of monolinguals.

To summarise, most research is in agreement as to the importance of input for vocabulary development. The rate at which vocabulary is learnt is dependent on exposure to the language acquired, with performance of both monolingual and bilingual children greatly affected by variation in rates of exposure (De Houwer, 2007; Patterson, 2002; Pearson, 2007; Thordardottir, et al, 2006; Schelletter, 2012). The acquisition of grammar on the other hand cannot be learned entirely 'item-by-item' due to the sheer volume of potential word

combinations and rules. Grammatical knowledge must at some point become productive, allowing for the expression of meaning in various contexts. The extent to which exposure to grammatical patterns is important to successful acquisition is discussed in the next section.

2.2.2 Input and Morphology Acquisition

While there are strong correlations between input and vocabulary knowledge in children, the exact role input plays in grammar acquisition and its relationship with grammar development is less certain (Gutiérrez-Clellen & Kreiter, 2003). While one could speculate as to whether grammar rules are parts of pre-existing structures (Pinker, 1991) or learnt through extracting regularities from accumulated input (Marchman & Bates, 1994); it is likely that different aspects of language may rely differentially on frequencies of input, depending on factors such as the regularity of the rule, may add a level of ambiguity to the exact role input may play (Thordardottir, 2014; Nicoladis, Palmer & Marentette, 2007).

While previous research investigating grammar acquisition in bilinguals has suggested bilingual children reach grammatical milestones at the same time as monolinguals do (Genesee & Nicoladis, 2006; Paradis & Genesee, 1996). Numerous recent papers are showing that grammatical development in bilingual children is clearly influenced by the amount of input they receive to each language (Hoff, Welsh, Place, & Ribot, 2014; Blom, 2010; Nicoladis & Marchak, 2011; Paradis, Tremblay & Crago, 2014; Unsworth, 2014; Sorace, 2011; Thordardottir, 2014). Input frequency has been found to be an important factor in the acquisition of various aspects of morphosyntax, such as grammatical gender. Unsworth (2013) found for Dutch-English bilingual children aged between 3 and 17 that both current and cumulative length of exposure was a significant predictor in gender marking on determiners, but not for adjectives. Gathercole & Thomas (2005; 2009) and Gathercole, Thomas and Laporte (2001) found similar trends in the acquisition of Welsh grammatical gender (see Chapter 5 for an overview) where frequency of exposure in the home had a clear

role to play. Paradis (2010) found in the production and judgement of English verb morphology that French-English bilinguals lagged behind monolinguals on those grammatical aspects, with French dominant bilinguals performing worse. These bilingual/monolingual differences have also been found for other grammatical aspects such as finiteness (Blom, 2010), mass/count nouns (Gathercole, 2002a) and *wh*-questions, passives, and definite/indefinite articles (Chondrogianni & Marinis, 2011). Gathercole (2002a, 2002b, 2002c) found when comparing Spanish-English bilinguals to monolinguals using home language as a measure of input frequency, that home language affected the acquisition of morphosyntax, with the monolingual children outperforming the bilingual children on grammaticality judgements tasks assessing mass/count noun distinction, *that-trace* effect, and grammatical gender on their knowledge of these structures. Her conclusion was that morphosyntactic abilities are linked to home language, and therefore input frequency.

As is the case with vocabulary, certain morphological rules have been suggested to emerge gradually in a piecemeal fashion, morpheme by morpheme (Gathercole, Sebastian & Soto, 1999), although, in the case of morphological structures such as the Dutch grammatical gender Unsworth (2013) suggests that acquisition is more rule-based from the outset. Irrespective of this, acquisition of morphosyntax tends to be sensitive to input properties such as the reliability of form-function mappings, type and token frequency (i.e. how often a certain morpheme/construct appears in the input) as well as semantic and phonological consistency (Lieven & Tomasello, 2008; Tomasello, 2003). For example, the English irregular past tense *had* has higher input frequency than *crept*, and will influence the sequence in which they are acquired (Bybee, 2001; Paradis, Tremblay & Crago, 2014). For bilinguals, in comparison to monolinguals, exposure to these constructions would usually be divided unequally between the two languages, thus the impact that token frequency has on acquisition rates in each language is more noticeable (Gathercole, 2007a).

Increased language input may not necessarily be a guarantor for the acquisition of less frequent and/or complex structures, however, where greater monolingual-bilingual or within-bilingual differences are often found (Gathercole & Thomas, 2009; Nicoladis, et. al, 2007; Unsworth, 2014). For example, when researching the acquisition of grammatical gender in Dutch, Unsworth, (2008) found L2 Dutch adults and L2 Dutch pre-teens scored higher for higher frequency nouns than for lower frequency nouns implying that an increase in the frequency of exposure to a noun correlates with higher performance rates. She also discovered an effect related to the length of exposure, as the pre-teens had considerably less length of exposure to Dutch than both adult and children groups, thus performed lower in comparison.

When looking at type and token frequency in the English and French past tense, Nicoladis, et al. (2007) found that French-English bilingual children were less accurate when producing the English regular and irregular verbs in comparison to the English monolingual children in the study. This result was also found for the French irregular verbs. Therefore, it is uncertain whether the effects found were due to the overall lower token of exposure they receive in each language, or the lower type frequency in the child's vocabulary.

Nevertheless, several morphosyntactic aspects of grammar are seen to be acquired without much delay, with bilinguals simply acquire them at a different time developmentally to monolinguals (Sorace, 2014). It has also been suggested that bilinguals tend to have more advanced morphosyntax in one of their languages (Bohman, Bedore, Pena, Mendez-Perez & Gillam, 2010; Thordardottir, 2014). While some research has suggested that no differences have been found for grammatical constructions for the language in which children receive the most input (Hoff, et al. 2012; Gutiérrez-Clellen & Simon-Cereijido, 2007), this may not be uniform across all comparison groups or in the acquisition of different grammatical constructions (Paradis, Tremblay & Crago, 2014).

In a study involving French-English bilingual children, Thordardottir (2014) looked at MLU as an indicator of grammatical competence. She suggested that MLU was not particularly sensitive to input, as there were no significant difference between the younger 3-year-old bilingual children and their monolingual peers. Thordardottir found that the young bilinguals fell within the normal range on MLU, however, at age 5 they started showing bilingual effects, with the bilingual children beginning to lag behind the monolinguals. These results complemented Paradis and Genesee's (1996) research, which also discovered similar findings.

The accuracy with which children in Thordardottir's study used grammatical morphology was revealed to be highly language-specific, although the older children were more accurate in their performance in comparison to the younger children, which is in line with typical acquisition patterns. The results suggest that those who received lower levels of exposure to a particular language had lower performance in that language, which resulted in the 5-year-olds with low exposure to English remaining at a similar developmental stage to that of the 3 year olds. The findings suggested that receiving 25% of exposure to English was insufficient for development of that language. Both studies infer that children need to receive a large proportion of input in order to reach similar levels as monolinguals. However, Thordardottir concluded that the children in her study were adhering to the developmental pattern typical of each language, which is in line with previous studies on the subject (De Houwer, 2009; 2011), and the rate in which the grammar of each language was developing was proportionate to the amount of input they received. Therefore, subject to sufficient exposure, bilingual children should score similarly to monolingual children with research suggesting that by age 5 a 40-60% of exposure to each language is sufficient for this to happen (Thordardottir, 2011); 4-6 years of exposure from the AoO (Hakuta et al, 2000). Or as Cattani et al., (2014) concluded in their study, bilingual toddlers learning English as an

additional language need to hear English 60% or more of the time in order to perform to the same level as monolingual speakers on measures of English vocabulary.

Therefore, whilst research has clearly shown that the frequency of exposure is important for both vocabulary and for aspects of morphosyntax, others have tried to explain how and why frequency matters so much. The following section outlines some of the proposed ‘theories’ that attempt to explain these results.

2.3 *Critical-Mass Hypothesis*

As implied previously in this chapter, there are many factors that influence children’s ultimate attainment in language development. It has been suggested that in order for children to successfully acquire a language, they need to achieve a ‘critical mass’ of exposure, particularly to grammatical structures. That is, children need to reach a certain threshold of exposure to certain structures in any of their languages in order to be able to abstract regularities from the input and generalise patterns in a productive manner (Conti-Ramsden & Jones, 1997; Elman, 2003; Gathercole, 2002abc; Marchman & Bates, 1994). Marchman and Bates (1994) proposed the ‘critical mass hypothesis’ to describe the pattern of irregular and regular past tense verb acquisition in children. They found that with an increase in vocabulary size past the 50-word mark, the number of stem-only verbs produced by children decreased while their production of past tense irregular verbs increased, with the number of correct irregular forms accelerating with the increase in vocabulary size. They suggested that this was due to the assumption that the brain requires a certain number of ‘exemplars’ in order to acquire and retain a grammatical rule or an understanding of the concept(s) attached to a word label (Gathercole, 2002c). Therefore, it could be argued if a child does not receive this ‘critical mass’ then he or she might not acquire relevant structures in that language (Lanza, 1997), leading to incomplete acquisition (Montrul, 2008).

The notion of critical mass is dependent on the strong relationship observed between language acquisition and the subsequent developments in different linguistic domains. Thus, given the vast amount of research that has revealed reduced input frequencies among bilinguals, it is logical to assume that bilinguals are likely to take longer to reach this ‘critical mass of exposure’ in order to fully acquire a productive grasp of both languages (Maratsos, 2002). However, after accumulating the ‘critical mass’ of exposure to certain structures, children are less likely to make errors with those structures, and those structures are likely to become fully acquired (Gathercole & Hoff, 2006). However, the extent to which minority language contexts, in particular, are able to provide this ‘critical mass’ is of interest to the studies in this current thesis and is explored in studies looking at the so-called ‘bilingual catch-up’ as noted below.

2.4 *Bilingual Catch-up*

Whilst early differences between bilingual children’s linguistic knowledge in each of their languages have been found for many bilingual pairs (as discussed earlier in the chapter), there is evidence to suggest that these early differences become neutralised by the end of primary school (or at the very least, by adulthood) once the child has accumulated the ‘critical mass’ of exposure. That is, with time, and under favourable language learning conditions, bilinguals should ‘catch-up’ with their monolingual peers (Gathercole, 2007a; Oller & Eilers, 2002; Thomas & Mayr, 2010; Paradis, 2010; Bahrack, et al, 1994). This was apparent in a study by Oller and Eilers (2002) which compared bilingual and monolingual children aged 5-10 from English speaking households (OEH), Spanish speaking households (OSH) and homes where both Spanish and English were spoken (ESH). They discovered in receptive and productive vocabulary tasks, that children who received the most input from each language performed best, and with age the differences were showing a projection

towards neutralising across language group as each child became older and had received more input, and therefore more experience with each language.

In the case of grammar, a study by Paradis, Trembley and Crago (2014) compared French-English bilingual children aged 6 and 11 on their acquisition of clitics and articles in French. All children attended French-medium schools where French was the exclusive language of instruction. The results revealed that at age 6, there were no differences between the children who came from French-English homes and the French monolinguals in their knowledge of object clitics, but there were significant differences between the mainly English home children and the French monolingual children. However, at age 11 there were no differences in performance across home language, suggesting that those differences were neutralised in the participants' dominant language with greater input. One flaw in the study was their lack of monolingual control for the older age group; however, given the high performance of 90% correct it can be assumed that acquisition of these structures was almost complete.

These results suggest that bilingual-monolingual differences were likely to be neutralised in the language of schooling since the increase in input the children received was sufficient for them to 'catch-up'. Paradis et al. (2014) suggested that the neutralising in differences was due to a dominant language effect, that is, the children were receiving enough input from the dominant language to enable them to 'catch-up' with their peers. Marchman, Martinez-Sussman and Dale (2004) found similar findings for Spanish-English toddlers. The percentage of input in each of their languages (as stated in a maternal self-report) correlated significantly with their morphosyntactic achievements in that language. These findings suggest that bilingual-monolingual differences can greatly diminish or disappear in the bilinguals' dominant language of exposure, particularly for the more consistent and frequent syntactic structures of that language (e.g., Paradis, 2010; Paradis, Genesee & Crago, 2006).

However, it is still unclear as to how long it takes for bilinguals to ‘catch-up’ with monolinguals in their L2 and under what circumstances that can happen. From a societal perspective, especially in minority language context where education is the main source of transmission for some, L2 newcomer proficiency is important to understand, as it is a factor that will underpin their academic and integration success (Cummins, Miraz, & Stille, 2012). For children learning English as an L2, studies have concluded that it will take about four to six years of schooling in the L2 for them to achieve monolingual-like competence in oral language proficiency (Hakuta, Butler, & Witt, 2000; Saunders & O’Brien, 2006). However, Farnia and Geva (2011) found that L2 English children from different L1 backgrounds did not show any signs of convergence from grades one to six, even in their receptive vocabulary knowledge.

In more recent research, Paradis and Jia (2016) and Paradis et al. (2016) conducted a longitudinal study looking at L1 Chinese children learning English as an L2, assessing their long-term outcomes in English. Paradis and Jia’s study assessed their vocabulary, grammar, and global comprehension using standardised test from 4 ½ years to 6 ½ years of exposure to English in school, with an AoO younger than 6 years old. Participants were tested in three rounds, with success measured based on three questions: (1) Is the bilingual mean at or above the monolingual/standard mean? (2) Is the bilingual one SD at or above the normative one SD? And (3) did all individual bilingual children score at or above one SD? The researchers proposed if 2/3 of these questions were met, then it could be concluded that there was convergence on the monolingual norms of that round as a group. If all three were met, then convergence could be considered at an individual level.

For the PPVT-4 vocabulary test, results showed that there was a linear growth with each testing round, with the 2/3 criterion met during the second round of testing. However, the 3/3 criterion was not met at round three. To test grammar and global comprehension, the

participants were tested using the CELF-4 recalling sentences, word classes receptive, word classes expressive, and understanding spoken paragraphs. For receptive vocabulary, there was no significant change from the first round to the second. There was a significant change from the second round to the third, suggesting that growth was slower than the aforementioned test. The 2/3 criterion was met during the first round, and the 3/3 during the third round, suggesting full ‘catch-up’ for receptive word classes. However, for expressive vocabulary, the children did not show signs of convergence during any of the rounds, with no linear growth. The same was found for understanding spoken paragraphs and recalling sentences. However, they did find the 2/3 criterion was met at round two, but the 3/3 was not met at round three.

Using the same participants and convergence criteria, Paradis et al. (2016) investigated the participants’ production and judgement of English verb morphology. Using the TEGI, they targeted the verb constructions 3rd person singular, past regular, past irregular, BE auxiliary and copula and DO auxiliary. Results revealed that while the children were performing highly accurately by the third round, not all children experienced ‘catch-up’ with 61% not converging with monolinguals on one or two of the tests, while 39% did converge and reach monolingual levels on all tests. However, their developmental trajectories showed for the majority of tests between the second and third round, the children were showing a plateau in growth trajectory in all bar the BE test.

Both papers conclude that there is no certain conclusion as to how long it takes L2 English children to converge with monolingual norms. Individual variation, task difficulty, and input properties may also play a part, and these will be discussed in the next section. However, before moving on to discuss other factors that influence catch-up, one issue to consider is the appropriateness of using language tests developed with monolingual norms as the standard to which bilinguals are compared (Ellis, 2008). Many studies that have been

published make use of such tests as their measures, which may underestimate bilinguals' actual abilities. Many of the studies discussed above also compare L2 English bilinguals to monolinguals in an English dominant context. The extent to which such findings are relevant to minority language bilingual populations is unclear, and this issue needs to be kept in mind as we interpret the findings of research. The next section goes on to discuss some of the factors, such as input quality and minority languages status, that can influence whether or not the 'catch-up' occurs.

2.4.1 Acquisition of Minority Languages

In the context of this thesis, it is important to address the differences found in 'within-bilingual' populations, where one of those languages is a minority language. Bilingual children who learn a minority language in the home will generally have stronger commands of that language as compared with those learning through immersion schooling. Even simultaneous bilinguals who receive input in both the dominant and minority language from each parent from a young age do typically lag behind those who have both parents speaking the same language on measures of linguistic competence during the primary school years (Gathercole & Thomas, 2009).

When the community does not support the minority language, individuals have been shown to be reliant on input from the home for the minority language (Pearson, 2002). In a context like Wales, if Welsh is heard mainly at school speakers are equally reliant on input from the school context, rendering exposure to the language largely domain-specific. This domain specificity has been suggested as a possible cause of the differences found between speakers such that if a child is only receiving input in one language from an education context then there is a risk that vocabulary acquisition will be tied to that domain (Oller, 2005), as mentioned above. For grammatical constructs also, the frequency of exposure to certain structures they receive might be low if the context of acquisition is from that domain only.

This can have an effect on structures with opaque form-function mappings and/or structures that are undergoing structural change (Gathercole & Thomas, 2009) which, arguably, would require even greater amounts of input in order to reach a stage where structural properties can be statistically computed reliably.

In line with the previous discussions in this chapter, the most probable explanation for a lack of ‘catch-up’ in the minority language is that bilingual children simply will not receive as much exposure to their minority language as they would to the dominant community language (Gathercole, 2002b). Children who use a minority language in the home will generally receive enough input in their majority L2 from the community to converge with their peers in their L2 abilities. However, in contexts where the political minority (and/or less dominant language in terms of overall speakers in a country or in terms of resources, etc.) is spoken by the majority in a certain region, this ‘automaticity’ of majority language acquisition might not always be the case (Rhys & Thomas, 2013). However, those children whose only exposure to the minority language is in a school setting may not necessarily receive enough exposure to the minority language from their wider environment to ‘catch-up’ with their peers (Gathercole & Thomas, 2009).

In some communities where languages are more balanced in regards to prestige, such as areas where both French and English are majority languages (Thordardottir, 2011; Paradis et al. 2014), children can gain similar levels of performance in both languages, as highlighted earlier in the chapter. However, in the case of children with unequal patterns of exposure, their performances do not always level out. In communities where the language is a minority language in the community, the acquisition of the minority language can be hampered as a result of reduced input (Schlyter & Håkansson, 1994; Meisel, 2007) and, as a result, these children may never become native-like in both languages (Gathercole & Thomas, 2009). This

issue is particularly relevant in the case of Welsh. Welsh is a minority language with 19% of the population speaking the language (Welsh Government, 2012).

However, there are pockets of society where Welsh is indeed in the majority, and some studies have found the English competence, particularly in terms of vocabulary development (albeit tested using monolingual-normed tests), is hampered among L1 Welsh speakers and 2L1 speakers as compared to L1 English speakers in such areas (Rhys & Thomas, 2013). In the case of L2 learners of Welsh, exposure to Welsh is predominantly school-based, and learning under these conditions may result in some structures becoming ‘timed off the map’ for acquisition. Meaning that the acquisition process falls short of the necessary time frame, possibly a critical period in which speakers need to gain significant exposure to these linguistic forms if they are to be learnt, leading to incomplete acquisition of these structures (Unsworth, 2012).

Therefore, for minority languages the timing of acquisition and general ultimate attainment are related to the overall input they receive in that language, with Gathercole and Thomas (2009) finding the development of Welsh was highly linked to measurable patterns of input at all stages. They found children from homes where only Welsh was spoken and those who attended Welsh medium schools showed higher performance on most Welsh structures. This trend was continued into adulthood, with the researchers suggesting that for Welsh, continuous exposure to the language is needed to maintain it. However, differences in the dominant language, English, disappear by mid-school age, according to some studies (e.g., Gathercole and Thomas, 2009), and by a little older – 13 – according to others (Thomas et al., 2014; Thomas, Gathercole & Hughes, 2014).

2.4.2 *Quality of Input*

For successful acquisition there are other factors beyond input frequency to consider, such as the quality of input. Armon-Lotem, Joffe, Abutbul-Oz, Altman, & Walters (2014)

suggested that factors relating to language development fall into two categories: proximal or distal. Proximal factors comprise of basic quantity measures, such as the length of exposure and the percentage, or amount of daily input that an individual receives in each language (as discussed above). Distal on the other hand, are broader environmental factors that shape the proximal factors more qualitatively, for example the quality of input, socio-economic status, minority/majority language, and attitudes (Patterson, 2007) that can influence the nature and frequency of the input being heard. Suggesting successful acquisition is reliant on not only the amount of input being received but also on factors such as the quality of the input.

Sorace (2005) suggested that both qualitative and quantitative differences in the input bilinguals receive can have a destabilizing effect on outcomes – that is, if there are differences in the input properties, such variable language ‘richness’, these difference can have an effect on emerging grammars. She implied that a difference in input quantity leads to issues in processing abilities, as the learner has less opportunity to integrate syntactic information, while quality differences leads to issues with the representation of those forms. Input from different types of speakers has been suggested to inhibit acquisition, for example input from attrited speakers (speakers whose language has undergone attrition) (Sorace 2014) or input from adult L2 learners that may not be considered ‘ideal’ input quality for optimum language transmission that match the typical spoken norms within society. For example, a study by Hulk and Cornips (2006a) looked at bilingual children who were exposed to older L2 Dutch speakers who learned Dutch as adults. They argued that, due to the quality of the input received, children in the study fossilised in a stage of overgeneralisation that was typical of the L2 adults and that is not found in children exposed to native-speaker input. However, Unsworth (2008) challenged these findings, suggesting that there are some L2 learners of Dutch who achieve target-like acquisition of a language. Thus L2 learners are unlikely to have experienced fossilisation through exposure to poor input alone.

Another factor that may influence acquisition is inconsistent input, for example, how consistent a structure is marked in a particular way in the input a child will receive. A good example of this is the Welsh grammatical gender system. This system is a complex grammatical system that has very opaque form-function mappings between the noun form and the gender it encodes. This renders it a difficult system to acquire, even for L1 speakers (Ball & Müller, 1992, Gathercole & Thomas, 2005). However, unlike other complex gender systems, the Welsh grammatical gender system is used inconsistently by adults (Gathercole & Thomas 2009; Gathercole, Thomas & Laporte, 2001; Thomas & Gathercole, 2007) in the sense that adults do not always mark noun gender correctly and thus children receive poor quality input (see Chapter 3 for more details).

Studies assessing the role of input in the acquisition of this system shows that when comparing children aged 3-5 and 7-9 there was an increase in performance on these forms; however, the gaps between the 3 different language groups tested - L1Welsh, 2L1, L2Welsh – were still apparent at age 9, with the L1 children performing the best (Gathercole & Thomas, 2005). On the other hand, Thomas et al. (2014) investigated the acquisition of plural morphology in Welsh, which also has no clear form-function mappings that learners can rely on, however, in analysis of corpus recordings of natural L1 Welsh adults, the plural system is used consistently during adult-adult language discourse. This in turn indicates consistency in the marking of these forms across speakers, suggesting a higher ‘quality’ level in the transmission of this system to children from adults. However, regardless of the quality of transmission of this system, at age 11 children were still marking the plural form incorrectly, with L1 Welsh children performing significantly higher than 2L1 and L2 children (see Chapter 3 & 4 for more information on these studies). However, while consistency of the input has a clear impact on successful acquisition, other factors can influence the quality of the input that children receive, as discussed below.

2.4.3 *Socio-Economic Factors*

Socio-economic status (SES) has long been linked to children's acquisition of language (Hart & Risley, 1995; Hoff, 2003, Hoff-Ginsberg, 1998). Hoff (2003) found that children's SES could influence the rate of acquisition of different linguistic structures. Hart and Risley (1995) found that parents from high SES backgrounds spoke more to their children than those from middle or low SES, thus the children from higher SES backgrounds produced a higher number of words in comparison to children who came from middle or low SES families. The effect of SES is also apparent in the acquisition of vocabulary in both monolingual and bilingual children (Oller, 2005).

In research on bilingual children in the USA, populations tended to be from low SES backgrounds that typically spoke a minority language in the home and English in school (Gathercole, 2007b; Oller, Pearson, & Cobo-Lewis, 2007; Patterson, 2002; Pearson, 2007). When investigating vocabulary and literacy in bilingual Spanish-English children in Miami, Cobo-Lewis, et al. (2002) found that vocabulary was more affected by SES as compared to literacy, with children from high SES backgrounds scoring the highest. These findings are supported by other research linking low vocabulary scores to low SES (Golberg, Paradis & Crago, 2008; Oller et al, 2007; Chondrogianni & Marinis, 2011). In one study, an effect of SES was also found in the acquisition of semantics; however, it was not found for morphosyntax (Bohman, Bedore, Pena, Mendez-Perez & Gillam, 2010). Conversely, Gathercole (2002ac) found there was an effect of SES in the acquisition of mass/count nouns and in *that*-trace phenomena. Chondrogianni and Marinis (2011) found that children's ability to reach age-related norms was predicted by their mother's low proficiency in English, which suggests that verbal interaction associated with language acquisition is fundamental, albeit in low SES environments could be qualitatively reduced.

The quality of speech that children are exposed to differs in both monolingual and bilingual families from different SES backgrounds (Heart & Risley, 1992; Hoff, 2003). Consequently, variation in both the quality and quantity of the input is linked to the rate of acquisition of morphological rules. These variations could be a determining factor in bilingual-monolingual differences. However, to what extent SES affects children's acquisition of complex structures remains somewhat controversial (Noble, Norman & Farah, 2005). It is a possibility that higher SES parents see the value of bilingualism, and in the case of a minority language, may be more inclined to send their child to a minority-language school and to take an interest in their children's language development than those from lower SES. However, studies supporting this view are not available. However, a recent paper by Gathercole, Kennedy, and Thomas (2015) found for vocabulary ability and IQ, SES effects were more influential during the older years of a bilingual. While for younger bilinguals, exposure is the more influential factor. Therefore, it is possible that there are non-linguistic factors intertwined with linguistic factors in the context of SES that play a role in overall language attainment.

2.4.4 Grammatical Complexities and/or Infrequent Structures

Frequency of structures in the input plays a major part in successful acquisition (Tomasello, 2000). However, the complexity of the structures being learned (e.g., regular vs. irregular forms; overt vs. non-overt cues) can also affect the rate at which these structures are acquired (Blom, 2010; Unsworth 2008, 2012; Gathercole & Thomas 2009; Thomas & Gathercole, 2007). This in turn can affect successful acquisition of both grammar and vocabulary. When the grammatical properties of the target language are transparent, results have shown bilinguals to reach ceiling levels in a similar time frame to L1 children (Unsworth, et. al., 2014; Unsworth, et al. 2011). Obtaining the 'critical mass' of exposure in relation to those frequently heard structures is regarded to be an easier process, but for lower

token frequency items, or those with inconsistent form-function mappings, receiving enough input in order to abstract out the rules is more difficult (Gathercole, 2002c). That is, the threshold for acquisition is dependent on the transparency and/or reliability of the input. Research on the Dutch grammatical gender system, a complex and opaque system, discovered that bilingual and L2 Dutch children continue to overgeneralise gender agreements even as they became older. Blom, Poliřenská, and Weerman (2008) suggested this was due to children not yet acquiring the rule, and speculated that only “*a lengthy period of substantial exposure could compensate for weak statistical properties of the input*” (p.323). That is, the reduced amount of input the children were exposed to suggest that the appropriate ‘critical mass’ needed to deduce the rule cannot (or is difficult to) be attained (Unsworth, 2013; Meisel, 2008).

Research on French-English bilingual 4-year-old children by Paradis, Nicoladis, Crago & Genesee (2011) found production of the regular and irregular past tense in English and irregular past tense in French to be less accurate than that of their monolingual peers; however, there were no differences in their production of the regular past tense in French. When home language was considered, French dominant bilingual children performed on par with the French monolingual children, in the same way as English dominant children performed the same as English monolinguals. However, for the English irregular past tense the English-dominant bilinguals still lagged behind their monolingual peers. It was argued that this could be due to the fact that irregular verbs in English are simply harder to acquire.

2.4.5 Input Over Time

Unsworth (2012) found that with simultaneous Dutch/English children aged 3-17, a predictor of the children’s ability to produce target definite determiners with neuter nouns was the total amount of exposure they received over the years. The cumulative amount of exposure they received to the language(s) was also a significant factor, which led to the

suggestion that a prolonged, lifelong exposure to a language is key for bilingual acquisition, a factor that is also true for Welsh-English bilinguals (Gathercole, 2007). Unsworth (2012) also suggested that even with the complexities of these systems, acquisition may be ‘timed off the map’ for these structures. Unsworth’s findings are a contrast to the aforementioned study by Paradis et, al. (2014) which looked at children’s acquisition of object clitics in French, a similarly difficult to acquire structure, with low token frequency and inconsistent form-function mappings (Paradis, et, al. 2014). However, at age 11 differences between groups in Paradis et, al’s study were seen to be neutralised.

However, these studies suggest that there are other factors to be considered that can influence this ‘catch-up’ rather than input alone. Therefore, what the current literature demonstrates is the importance of quality and quantity of input in bilinguals’ acquisition of linguistic forms, but that any ‘catch-up’ within bilinguals or across bilinguals and monolinguals cannot be automatically assumed.

2.5 *Incomplete Acquisition, L1 Attrition, or Dominance Shift?*

Learning under the conditions such as those afforded to minority languages can lead to what Montrul, (2008, p.93) refers to as incomplete acquisition:

“When language exposure and use is reduced in childhood, the grammatical system of bilingual children in either language, and in some cases of their family language, can be dramatically compromised, especially at the level of morphosyntax”

This suggests that under more unfavorable conditions it is possible, although not obligatory, that L2 Welsh speakers may never reach the same levels of competence as L1 speakers. However, these conditions could also hamper L1 and simultaneous bilinguals if comparing their acquisition levels to that of adults. Montrul (2008) suggests that, in minority language situations where the family is the sole transmitter of the minority language, if both

L1 and simultaneous bilinguals are still acquiring their L1 when the L2 is introduced then the early exposure to the L2 can lead to the minority L1 lagging behind. This comparison is relevant to the Welsh context insofar as children, regardless of whether their home language is Welsh or English, are likely to be developing an L2 (or a simultaneous L1) at the same time as they are continually developing their L1 and the effects of this can influence outcomes for both languages.

Given that simultaneous bilinguals on average receive less exposure to the minority language, simultaneous bilinguals are more at risk of L1 attrition after the introduction of the L2 in comparison to sequential bilingual children, who will generally start acquiring the L2 language at a later age (Montrul, 2008). Attrition is defined as “*the (total or partial) forgetting of a language by a healthy speaker*” (Schmid, 2011; p.3) and can occur rapidly in the L1 after an L2 is introduced; manifesting itself in the L1 lexicon, with the child inserting increasing amounts of L2 nouns into L1 sentences (Kaufman & Aronoff, 1991). L1 language loss is common when it is disused and L2 exposure is increased significantly. This loss can happen at any time in children after the introduction of an L2, leading to either incomplete acquisition of the L1, attrition or both. Montrul, (2016) suggests that the lack of sustained and consistent exposure to the L1 during childhood is a primary causer of language attrition. Particularly, around the time that the native L1 is not fully developed in the brain.

For simultaneous, and sequential bilingual children, their proficiency and use of the L1 and the L2 can change with time, especially when they start to acquire basic proficiency and literacy skills in the L2 (Montrul, 2008). This loss or attrition can be particularly salient if the minority L1 is not supported in the educational system. However, Montrul suggests that language vulnerability to L1 attrition decreases around the ages of 8-10, therefore if exposure to the minority language continues after the age of 10 then attrition may not occur. For adults, attrition manifests itself generally as changes in lexical retrieval and processing. For children,

on the other hand, attrition and incomplete acquisition can affect vocabulary and morphosyntax, thus appearing to have a greater effect than attrition in adults, or as the child matures (Montrul, 2008).

Other research has suggested that the early onset of an L2 has no dramatic effect on L1 attrition (Wong-Fillmore, 1991) and does not affect L1 maintenance (Rodríguez, Díaz, Duran & Espinosa, 1995). Minority language children younger than 10 have been found to show a more rapid shift towards the majority L2 and a larger degree of loss in the L1 than older children (Montrul, 2016). While they rarely achieve balance between languages, it is the minority language that is often the language at risk of attrition and eventual incomplete acquisition, rather than the dominant (community) language (Montrul, 2008). Therefore, in the context of Wales, taking the attrition data and the previous discussions of this chapter into account, bilingual children from backgrounds where both Welsh and English are spoken in the home will be at a greater risk of attrition of the minority language as compare to L1 Welsh children whose home language is mainly Welsh. Whereas those speaking English at home but exposed to Welsh at school are at greater risk of incomplete acquisition of their Welsh at older ages due to psycho-social factors influencing their use and engagement with the language.

However, the L1 attrition literature has mostly focused on children who have immigrated to countries where the (minority) L1 is not supported by the schooling system. This is not always the case in Wales, where in some areas Welsh-medium education is common. It has long been noted that education does not offer bilingual children protection from language shift and/or language loss (Wong-Fillmore, 1991; see also Chapter 6) and incomplete acquisition in simultaneous bilinguals can manifest itself during school age, even when instruction in that language is available. Montrul and Potowski (2007) and Gathercole (2002b) found that Spanish-English children's acquisition of nominal inflection morphology

was still vulnerable to incomplete acquisition, even with educational support for Spanish, although they also found that for other aspect of syntax – the acquisition of *that*-trace –was unaffected. Paradis et al. (2016) found that her participants seemed to plateau in their acquisition of more complex grammatical structures, even with continued education in that language. Therefore, it is a possibility that 2L1 and L2 Welsh participants might not improve in their acquisition of the more complex grammatical aspects, leading to eventual incomplete acquisition of those structures.

The close relationships between language dominance, language exposure, and language use are factors that affect attrition in children more than adults (Montrul, 2008). Adults, unlike children, have fully acquired their L1 and have spoken it for many years, and have been found not to experience attrition of the L1 even when the use of the L2 increases (Montrul, 2008). L1 attrition is a factor that must be acknowledged when discussing possible incomplete acquisition within L1 Welsh language teenagers. Particularly when dealing with 2L1 bilinguals, and possibly more so with those for whom Welsh was transmitted in the home via the father rather than the mother, given the tendency for fathers to revert to the language of the mother when speaking to their child(ren) (Gathercole & Thomas, 2007). It may also be a pattern among L2 speakers who may thrive at speaking and using Welsh in the primary sector but decline in use in the secondary sector (Thomas, Gathercole & Hughes, 2014) which could be linked to a shift in dominance during that age. As Montrul (2008, p.133) states:

“For most school-aged children and adolescents, in addition to spoken input, written communication plays an increasingly important role. Once children begin to read, their language development becomes more individualized, guided more by personal interest”

Therefore, as with most minority languages, there is a risk of children shifting to show a preference for the dominant community language, especially if popular television programs and books are produced in the dominant language. This switching from home language

preference to community language preference can happen quite early on. Studies have found that immigrant children who arrived at a young age switched their primary L1 to the L2, thus becoming more dominant in the L2; however older children tended to keep their L1⁶ (Jia & Aaronson, 2003).

Kohnert and Bates (2002) found a gradual shift in balance from Spanish L1 to English L2 from middle childhood onwards, with accuracy and speed increasing for English over Spanish. This shift in dominance, especially with older children/young adults, was aided by the transferal of academic support from the L1 to L2, and by the community dominance of English. A shift in language dominance could also be found even if use of the L1 is continued in the home but not in education, which could imply that some linguistic structures may only be acquired through written forms. One could hypothesize that this shift in dominance is partially driven by the belief that native-like abilities in the L2 is beneficial, perhaps at the expense of the minority L1.

2.6 Summary

To conclude this chapter, explaining language development as a product of input alone is far too simplistic. Input clearly plays a role, but issues relating to input quantity, input quality as well as other psycho- and sociolinguistic factors have an impact on speakers' ultimate attainment (Paradis & Grüter, 2014). This thesis will go on to present results from three studies, then continue to examine the research available on the more sociolinguistic factors that can influence language development.

⁶ Anecdotal evidence shows numerous examples of families in Wales where one parent speaks Welsh and the other speaks English to the child, but where the child responds to the Welsh-speaking parent in English. This is most notably the case when such families live in regions where English is the dominant community language, but is not impossible to find in the more Welsh-dominant areas also.

Chapter 3: Teenagers' Acquisition of Grammatical Gender in Welsh

As highlighted in Chapter 2, one aspect of language acquisition that has received considerable attention in the Welsh context thus far is grammatical gender. This chapter will describe the Welsh grammatical gender system and discuss previous findings in relation to children's acquisition of the system. This chapter will also present the findings from the current study, which looked at different groups of Welsh-English bilingual teenagers' performance on tasks that tapped into their knowledge of the system in order to address whether or not they converge in their knowledge of grammatical gender as they become older. The implications of the findings of the study are summarised briefly at the end, and expanded upon in Chapter 7 (General Discussion).

3.1 *Grammatical Gender: A Brief Introduction*

Grammatical gender is a noun class system that categorises nouns into various categories based on shared properties in certain syntactic domains (Corbett, 1991). Not all languages possess grammatical gender. For example, Finnish does not mark nouns for gender, while other languages such as English and Chinese show natural or semantic gender (Vigliocco & Franck, 1999). Languages that show natural gender distinguish between some nouns (usually human or animate such as *man* and *woman* or *ram* and *sheep*) by their real world gender. Nouns with male referents will be distinguishable from nouns with female referents via different marked properties that they take. In languages like English for example, gender is based on additional semantic information, and is marked by constructs that carry gender information such as the third person singular pronouns *he* and *she* (Martinez & Shatz, 1996). Anything that does not carry this gender information is marked by the neutral marker *it*. In some cases, gender information may be carried in markers on the nouns themselves such as the feminine noun suffix *-ess* to distinguish between a female (*actress*, *stewardess*) or male/neutral (*actor*, *steward*) referent. In most cases, however, English

inanimate nouns carry no gender information and so English is not described as possessing grammatical gender.

However, English and Finnish are among the exceptions. In the case of most Indo-European languages, there are either two or three ‘gender’ classes for nouns. These categories are usually masculine and feminine, and for languages with a third class – neuter. For example, French and Spanish have two categories - masculine and feminine, while German and Dutch have three – masculine, feminine, and neuter.

3.1.1 Grammatical Gender in Welsh

Welsh grammatical gender is a two-gender system, which generally encodes animate and inanimate nouns as masculine or feminine. In describing the Welsh gender system, Watkins (1993) stated that “*gender contrast, masculine and feminine, is inherent in head words, though for the most part not explicitly so*” (p.309). Suggesting that noun gender in Welsh, unlike in many other Indo-European languages, is not easily detected through noun form itself, and gender assignment is often random in the spoken language (i.e. assignment of noun gender does not always follow the prescriptive norm) as a result. This renders the system relatively complex, particularly in comparison to the system in other Indo-European languages.

The complexity of the Welsh grammatical gender system is largely down to the uniqueness of how gender agreement is expressed. Unlike most other gendered languages, Welsh has no gender marked determiners or highly reliable gender-marked suffixes. Instead, the gender of a particular noun in Welsh is encoded through mutation (Gathercole & Thomas, 2005 – see below). Mutations are a set of morpho-phonological changes that affect certain word-initial consonants of nouns (see table 3.1 for the consonant sounds that mutate) and are “*conditioned by the environment in which the target word appears*” (Thomas & Gathercole, 2007, p.252). There are three types of mutation processes, Soft Mutation (SM), Aspirate

Mutation (AM), and Nasal Mutation (NM), with grammatical gender primarily encoded through SM and AM (Gathercole & Thomas, 2005). Mutation can be 'triggered' by a lexical item (e.g., the preposition *ar* 'on' triggers SM onto a following noun – e.g., *ar goeden* 'on (a) tree' < *coeden* 'tree') or by syntax, as is the case of gender. Since the focus of this chapter is on grammatical gender, the mutation system itself will not be discussed in great depth (see Ball and Müller, 1992 for an extensive coverage of the mutation system), and the focus will be on SM and AM since these are the two mutation processes that mark gender.

Currently only nine sounds undergo SM, six NM, and three AM (see Table 3.1).

Table 3.1: Consonants and their mutated forms under SM, AM, and NM.

Radical		Soft (SM)		Nasal (NM)		Aspirate (AM)	
c	[k]	g	[g]	ngh	[ŋ]	ch	[x]
p	[p]	b	[b]	mh	[m̥]	ph	[f]
t	[t]	d	[d]	nh	[n̥]	th	[θ]
g	[g]	-		ng	[ŋ]	-	
b	[b]	f	[v]	m	[m]	-	
d	[d]	dd	[ð]	n	[n]	-	
ll	[l]	l	[l]	-		-	
rh	[r]	r	[r]	-		-	
m	[m]	f	[v]	-		-	

3.1.2 Noun Form

In Welsh, noun form provides little information about noun gender; however, whilst some such forms do exist, the numbers of exceptions outweigh their applicability as 'rules'. There are some phonological features that are shared across noun sharing the same gender e.g., single syllable words with *w* /-u-/ and *y* /-ə-/ as their core vowel are often masculine whereas single-syllable words with *e* /-ε-/ and *o* /-ɔ-/ as their core vowel tend to be feminine (Watkins, 1993). However, there are many exceptions among highly regular words such as *llwy* "spoon" is feminine whereas *corff* "body" is masculine. Therefore, there are no regular phonological features that can be relied upon to ascertain the gender of a noun, since nouns that share the same gender share very little in terms of form.

Similarly, there are also some, mostly abstract, nouns that can be identified as either masculine or feminine based on their noun endings. For example, the following endings are usually feminine: *-aeth*, *-iaeth*, *-as*, *-fa* *-ach*, *-en*, *-ell* while the following endings are usually masculine: *-ad*, *-aint*, *-awd*, *-od*, *-dod*, *-deb*, *-der*, *-ter*, *-did*, *-tid*, *-dra*, *-dwr*, *-edd*, *-had*, *-i*, *-iad*, *-iant*, *-ineb*, *-ni*, *-ioni*, *-id*, *-rwydd*, *-wch*, *-yd*, *-yn*, *-cyn*, *-we* (SurrIDGE, 1989; Thomas, 2001). There are exceptions, however. For example, *triwantiaeth* “truancy” is grammatically masculine but ends in *-aeth* a suffix usually associated with feminine nouns, and *gwawch* “squawk” is grammatically feminine, but ends in *-wch* a masculine related suffix. However, most words ending with these suffixes are considered ‘literary forms’ and many of these forms do not feature regularly in normal, day-to-day speech, and particularly not so in child-directed speech.

3.1.3 External Features That Indicate Gender

There are other features or patterns beyond noun form that can be used to identify the gender of a noun, as listed below (Thomas, 2001):

- i. Verbal nouns are always masculine (Watkins, 1993).
- ii. Animate nouns are usually (but not always) marked by their biological gender (Thorne, 1993).
- iii. Semantically related nouns usually share the same gender, although exceptions exist (King, 2003; Thomas, 1996; SurrIDGE, 1989) for example:
 - a. Days, months, and seasons are masculine (King, 2003).
 - b. *Gwyl* “festivals” are feminine, main holidays are masculine (SurrIDGE, 1989).
 - c. Wind and compass points are masculine (Thomas, 2001).
 - d. Material or substances are masculine, although there are exceptions such as *diod* “drink” which is feminine (Williams, 1980).

- e. Rivers and streams are feminine, while place-names that begin with *Nant-* tend to be masculine (Williams, 1980).
- f. Trees and types of trees tend to be feminine (King, 2003); however, if the form is coupled with *pren* “wood” they become masculine, if used with *coeden* “tree” they remain feminine (Surridge, 1989).
- g. Countries, cities, towns, and villages tend to be feminine; however, names for land and area are masculine (Williams, 1980; Thomas, 2001).
- h. Mountain names are mostly feminine, bar a few exceptions (Thomas, 1996).
- i. Most words for roads are feminine, while *llwybr* “path” is masculine (Thomas, 1996).
- j. Clothing is usually feminine; however, there are exceptions (Thomas, 1996), particularly in relation to clothing traditionally associated with males (e.g., *crys* – “shirt”; *trowsus* – “trousers”).
- k. Letters are feminine (Thomas, 2001).
- l. Collective nouns tend to be feminine; however, there are many masculine exceptions (e.g., *teulu* – “family”; *cynulliad* – “assembly”) (King, 2003).
- m. Fruits and vegetables are usually feminine, however masculine exceptions exist, such as *lemon* “lemon”, and *afal* “apple” and *oren* “orange” can be either gender (Surridge, 1989).

Whilst such regularities may help children build their knowledge of the system, it remains the case that the irregularities and exceptions are so widespread, children cannot rely solely on such patterns whilst building the system. Instead, children must turn to the marked properties of the system and to the noun-gender agreement patterns that are marked both in contexts that are local to the noun and in contexts that are distant from the noun itself, as described below. This is where mutation has a role.

3.1.4 Local-marked Constructs

In Welsh, gender is marked locally in the following ways:

1. Initial consonant sounds of feminine nouns undergo SM following the definite article

y(r) “the” or after the numeral *un* “one”. For example:

- i. *cath*_{fem.} - *y gath* “the cat”
- ii. *coes*_{fem.} - *un goes* “one leg”

2. The initial consonant sound of adjectives undergoes SM if modifying a feminine singular noun. For example:

- i. *cath*_{fem.}; *du*_{adj.} - *y gath ddu* the-cat-black “the black cat”
- ii. *basged*_{fem.}; *mawr*_{adj.} - *un fasged fawr* one-basket-big “one big basket”
- iii. *cadair*_{fem.}; *bach*_{adj.}; *brown*_{adj.} - *cadair fach brown* chair-small-brown “small brown chair”

In addition, some adjectives and quantifiers have a corresponding gender form that agrees with the gender of the co-occurring noun (Thomas, 2001). For example, there are masculine and feminine forms for the following numerals and adjectives⁷:

- | | | | |
|------|---|----------------|---|
| i. | <i>dau</i> _{masc.}
<i>dau gi</i> _{masc.}
“two dogs” | “two”
vs. | <i>dwy</i> _{fem.}
<i>dwy gath</i> _{fem.}
“two cats” |
| ii. | <i>tri</i> _{masc.}
<i>tri bwrdd</i> _{masc.}
“three tables”. | “three”
vs. | <i>tair</i> _{fem.}
<i>tair cadair</i> _{fem.}
“three chairs” |
| iii. | <i>pedwar</i> _{masc.}
<i>pedwar car</i> _{masc.} | “four”
vs. | <i>pedair</i> _{fem.}
<i>pedair torth</i> _{fem.} |

⁷ However, this is restricted to mostly high frequency adjectives, most of whom have vowels in central positions e.g.: *crwn*_(masc.)/*cron*_(fem.) “round” *gwyn*_(masc.)/*gwen*_(fem.) “white”. The uses of these forms tend to be recessive, even in literary Welsh. In colloquial speech only a few of the most common forms (*gwen*, *fer*, *dofn* - *dwfn* ‘deep’) are likely to be heard in speech, but even they are not consistently used (Watkins, 1993; Thomas & Thomas, 1989). Therefore, it is likely that in colloquial Welsh, innate gender distinctions within adjectives are becoming obsolete. Thus, for adjectives it is likely that mutation is the only remaining gender marker (Jones, 1993), which applies only to adjectives whose initial consonant mutate under SM.

	“four cars”		“four loaves”
iv.	<i>byr</i> _{masc.} <i>ci byr</i> _{masc.} “short dog”	“short” vs.	<i>fer</i> _{fem.} <i>cath fer</i> _{fem.} “short cat”

The ordinals, “third” and “forth” also have a feminine form, e.g:

i.	<i>trydydd</i> _{masc.}	“third”	<i>trydedd</i> _{fem.}
ii.	<i>pedwerydd</i> _{masc.}	“fourth”	<i>pedwaredd</i> _{fem.}

Similarly, certain prepositions have masculine and feminine forms, that are often (but not always) used in combination with a gender-marked pronoun:

<i>Safodd y gath arni (hi)</i> “The cat stood on her”	vs.	<i>safodd y gath arno (fo)</i> “the cat stood on him”
<i>Dywedodd wrthi (hi)</i> “Said to her”	vs.	<i>dywedodd wrtho (fo)</i> “said to him”

3.1.5 Distant-marked contexts

In addition to local marking, grammatical gender is marked by distant lexical agreement, which is marked by the pronouns *hi/fo*⁸ “her/his” or by the mutation triggered after the 3rd person possessive adjective *ei* “his/her” (Thomas & Gathercole, 2007; Gathercole, Thomas & Laporte, 2001). Distant marking within a sentence must be in agreement with the gender of the antecedent noun. If the antecedent noun is feminine (in this case, Miriam), *ei* triggers AM, e.g:

Mae Miriam wedi colli ei chath/ei chi
–it Miriam-has^{past}lost-be^{poss}-(AM)cat/dog
“Miriam has lost her cat/ dog”

If the antecedent noun is masculine (in this case, Osian), *ei* triggers SM, e.g:

Mae Osian wedi colli ei gath/ei gi

⁸ In the North Wales dialect, the pronoun *fo* “his” would be used; however, in the South and Mid Wales dialect *fe* is used.

–it Osian-has^{past}lost-be^{poss}-(SM)cat/dog
 “Osian has lost his cat/dog”

Irrespective of *cath* being grammatically feminine and *ci* being grammatically masculine, the 3rd person possessive adjective *ei* modifies the noun that follows it based on the gender of the possessor, regardless of the modified noun’s gender. This further complicates the system. Another complication is that the distant marked element contradicts the association of SM with feminine nouns in local constructs (i.e., after the definite article *y(r)* “the” and the numeral *un* “one”, as noted above). Since SM marks masculine forms in distant constructs after *ei* “his/her/its” (Thomas & Gathercole, 2007), so gender is not correlated with a certain type of mutation. In addition, in comparison to other grammatical gender systems, the Welsh gender system includes other features that make the system opaque. Below are a few examples of the complexities of the system (for more information see Thomas, 2001):

- i. In all other contexts bar those requiring gender marking, any word with a mutable word-initial consonant can mutate, regardless of their gender, and any adjective with a mutable onset will mutate.
- ii. Plural forms of feminine nouns do not mutate. For example: *cath* “cat” mutates after the definite article e.g. *y gath* “the cat”; however, *cathod* “cats” does not i.e. *y cathod* “the cats” (Thomas & Gathercole, 2007).
- iii. When nouns or adjective do not have mutable initial consonants, identifying noun gender in local marked constructs is made more difficult since mutation cannot be applied. For example, *ysbryd* “ghost” is grammatically masculine while *ystafell* ‘room’ is feminine; however, since *y* is not a mutable consonant (it is a vowel in Welsh) it will not mutate after the definite article. Therefore, the only way of distinguishing gender is if the adjective that follows mutates or not e.g:

yr ystafell fawr (mawr)
 the-room_{fem}-big “the big room”

yr ysbryd mawr
 the-ghost_{masc}-big “the big ghost”

Or if the noun is modified by a possessive adjective, a pronoun or a gender-marked preposition or numeral later on in the sentence:

gwelodd yr ysbryd nad oedd ei wallt yn hir
 see^{past}-the-ghost-not^{past}-it_{masc}-hair^{prep}-long
 “the ghost saw its hair was not long”

roedd yr ystafell wedi ei threfnu yn ddaclus
 it^{past}-the-room-had^{prep}-it_{fem}-arranged-^{prep}-neatly
 “the room had been arranged neatly”

However, if the following adjective does not have an initial consonant sound that mutates either, and the noun is not modified by a gendered marker (numeral, etc.), there are no clear cues to the noun gender, e.g:

yr ystafell hir
 the-room_{fem}-long “the long room”
yr ysbryd hen
 the-ghost_{masc}-old “the old ghost”

Given that *h* is not a mutable consonant, there are no cues to mark *ystafell* “room” as grammatically feminine and *ysbryd* “ghost” as grammatically masculine in the above examples (Tallerman, 1987). Likewise, under the gender agreement rules in distant-marked constructs, if the possessed item has no mutable onset, gender information can again become lost, e.g:

syrthiodd yr arth ar ei ysgwydd
 fell-the-bear_{fem}-on-its-shoulder
 “the bear fell on its shoulder”

- iv. Different dialects mark gender differently. For example, some masculine nouns are marked feminine in the north – *cwch* “boat” and *trên* “train” – while some standard feminine nouns are marked as masculine – *canolfan* “centre” and *tafarn* “tavern”. In more southern dialects, some masculine nouns are often marked in the spoken

language as feminine: *cinio* “lunch” and *cyngerdd* “concert” (Thomas, 1996; Thomas, 2001).

- v. Adults’ use of the system varies greatly within and across mutations types and vocabulary items (see Thomas, 2001), which is a likely consequence of their level of competence in the language and/or their frequency of exposure to gender-marked constructs (see Chapter 2). A given speaker may sometimes mark a noun as one gender in one sentence, but go on to mark the same the noun as a different gender in subsequent sentences. For example, a child might hear any number of the following variations in speech: *y *cath ddu*, *y *cath du*, *y gath ddu*, *y gath *du* “the black cat”, making it more difficult to abstract out clearly defined regularities from within the system.

These complexities and lack of clear regularities within the system makes grammatical gender in Welsh highly opaque as compared to other languages and likely to be more difficult and more time-consuming to acquire. As noted in Chapter 2, considering the general belief that the more input a child hears the quicker and more errorless their acquisition of morphology will be as they extract the grammatical properties of that language from the input (Tomasello, 2003). In minority language contexts, frequency of occurrence of language exemplars may be more limited, if not inconsistent and highly varied in some cases as the examples above suggest. This is important as it has also been suggested, as noted in Chapter 2, that is it not just the *quantity* of input that is important but also the *quality* of that input (Unsworth, 2012). Therefore, the question to be asked here is to what extent are children likely to acquire grammatical gender, as it is spoken by the population around them, given the ambiguous, varied, and possibly limited, input they are likely to receive.

3.2 *Acquisition of Grammatical Gender*

A number of research studies within the psycholinguistic field has looked at children's acquisition of grammatical gender. In the Welsh context, such studies have mostly focused on the role input plays in the acquisition of gender forms, and whether the system is learned in a systematic or in a piecemeal-like fashion. For example, Thomas and Gathercole (2007) assessed L1 Welsh children aged between five and nine, on their acquisition of grammatical gender and mutation using cued and non-cued inanimate nouns in a cloze task. The first experiment assessed the extent children mark distant gender constructs in Welsh. They were shown a sentence that included a cue: the determiner *y* or *yr* "the" preceding a possessor noun that triggers an SM:

e.g. *yn y llun yma fedri di weld y gadair* (<*cadair* 'chair'_{fem})
 in-the-picture-this-can-you-see-the-chair
 'in this picture you can see the chair'

Or sentences with no cues: a possessor noun with no mutation in an indefinite noun phrase, as Welsh does not have indefinite articles, indefinite NPs occur with no article, and neither feminine or masculine nouns mutate:

e.g. *yn y llun yma fedri di weld drych*
 in-the-picture-this-can-you-see-(a) mirror_{masc}
 'in this picture you can see (a) mirror'

They were also shown an additional sentence in which all nouns were elicited after the possessor *ei* (his/her/its)

e.g. *Dyma lun cwch. A dyma ei ...*
 Here's (a) picture of (a) boat. And here's its ...' (target noun *rhwyf* 'oar')

The second experiment assessed children's ability to produce SM in non-gendered context. They were asked to produce nouns after four different prepositions. Prepositions *ar* (on) and *o* (from/out of) trigger SM, whereas *mewn* (in) and *efo* (with) do not. The third experiment assessed children's ability to produce AM in non-gendered contexts after three

different linguistic items, conjunctions *a* (and) and *na* (nor) trigger AM, while the preposition *rhwng* does not.

The study concluded that children were yet to have acquired grammatical gender or the mutation system, with the inclusion of cues (determiner + noun, noun + adjective or possessive + noun) not significantly aiding their performance on the task with inanimate objects, and possibly resulting in an overgeneralisation of SM, with even adult participants not making use of the local gender-marked cues. However, participants' performance was stronger in the cued-context task in comparison to non-cued context, suggesting that poor understanding of the mutation system does not hamper grammatical gender knowledge.

Thomas and Gathercole (2007) also found that both children and adults performed best on items which involved *ei* + SM in comparison to *ei* + AM, with neither the children nor adults consistently using AM in an anaphoric reference. This suggested that masculine nouns are easier to acquire than feminine nouns under these circumstances; however, older children were apparently successful in attempts to apply aspirate mutation in reference to feminine nouns. For responses involving SM in non-gendered contexts, the results of experiment 2 showed progression between the younger ages and older ages. However, in experiment 3, there was no such progress for AM, with even adults struggling to produce AM in non-gendered contexts correctly. Overall, while there was an improvement seen with age in the gender context and for SM in non-gendered context, the system was still not acquired by L1 Welsh children at age nine.

Similarly, Gathercole, Thomas and Laporte (2001) and Gathercole and Thomas (2009) examined children's comprehension of long-distant gender agreement, using a forced-choice task where the child had to identify which of two pictures corresponded to the masculine or feminine pronoun or possessive form using the mutation as a cue.

e.g *Aeth y pengwin cysglyd_{masc.} a'r gath flinedig_{fem.} i'w gwelyau.*
 “the sleepy penguin and the tired cat went to bed”
Aeth o/hi i gysgu gyntaf
 “she went to sleep first”

In a sample of 101 participants, aged between 5 and 11, they found that there was a significant difference in the ability of children to identify noun gender according to whether they came from homes where only Welsh was spoken, where English and Welsh was spoken, or where only English was spoken. Those who came from homes where only Welsh was spoken performed best on the task. Gathercole et al. proposed that the difference in ability across the three groups was due to the varying degrees of Welsh input the children from different homes received. However, all children in the study were far from acquiring the system fully, and while Gathercole et al. also saw clear improvements with age, there did not seem to be any signs of convergence in ability across the three language groups.

Both papers conclude that grammatical gender and mutation in Welsh is acquired in a “*very piecemeal fashion*” (Gathercole, et al. 2001, p.83) meaning they acquire the system item-by-item, context-by-context, rather than forming links between the different gender-marked items to form an abstract, rule-based grammatical representation from the outset. This item-by-item approach results in some triggers being acquired earlier and easier to others, where children learn single form per noun (Ball, 1984; Hatton, 1988). This is supported by evidence elsewhere of children showing quicker progression for some forms such as SM contexts rather than contexts for AM (Hatton, 1988). This piecemeal approach to acquisition suggests that children and adults do not possess a “*systematic rule-based understanding of the system*” (Thomas & Gathercole, 2007 p.270). The extent to which these patterns are linked to the amount of exposure children may have to the language and therefore to the structures within the language is an important question, but so is the nature of the input itself, as discussed below.

3.3 *Variation in the use of Grammatical Gender in Welsh*

The majority of studies investigating speakers' use of mutation and gender in the vernacular typically fall within the *sociolinguistic* domain, with studies looking at the change in how mutation is used in different areas, by different individuals of different ages. In the Pwllheli dialect, Roberts (1988) found that different speakers marked noun gender differently. For example, the older generation marked *cwch* "boat" as masculine after the definite article e.g. *y cwch* "the boat", whereas younger generations marked *cwch* as feminine e.g. *y gwch*. Others have shown a decline in the use of mutation, particularly AM and NM, with some dialects seeing an overgeneralisation of SM to contexts where no mutation is required or where AM or NM is expected (Ball, 1984; 1985; Jones, 1988; Thomas, 1984). For example, AM is no longer produced consistently after conjunctions and in non-gender contexts, and is now more commonly (if not exclusively by some) used when following the possessive *ei* in a feminine marked context, and most often when the possessor is human (Thomas & Gathercole, 2007).

Some aspects of mutation may have greater resilience than others due to their 'functional load' (Ball, 1984). For example, AM is rarely used in traditional contexts that trigger AM, but its use as a marker of feminine gender after the third person possessive *ei* is fairly consistent, and particularly so in relation to human antecedents, as noted above (Jones, 1998). In fact, Jones (1998) reported that 100% of those over 25 used AM after *ei* to mark female antecedents. Therefore, when AM is applied in any context, it is quite reliably a marker of feminine (and often female) gender. However, triggers that do not carry a similar functional load, such as prepositions, are less likely to be mutated, especially by younger speakers (Jones, 1998).

Another development in terms of speakers' use of mutations in the replacement of trigger forms by *zero trigger forms*. The possessive form *fy* 'my' triggers NM onto the

possessed item (e.g., *fy nghar* < *car*, ‘my car’), but speakers often reverse the word order and modify the possessed item with a gender-marked pronoun (e.g., noun + *fi/fo* - *car fi* car-my ‘my car’) which avoids the need for mutation, a finding similar to that of Hatton (1988). As Jones (1998) concludes, a drastic decline in the use of mutation in young speakers of Welsh could lead to a further decline in mutation use by future generations, and thus a possible weakening of grammatical gender knowledge, especially within younger speakers. Jones attributed this shift to an increase in L2 speakers of Welsh and fewer L1 speakers, leading to fewer opportunities to hear standard forms of mutation. With such changes to the mutation system likely to continue, Jones further predicts that the younger generation will pass on a ‘reduced’ model, simplifying it across the decades. It is possible that in future, grammatical gender as a result could be regarded as an obsolete system, only functioning for items that have clear real-world gender applications (i.e. male vs. female marked by gendered pronouns, similar to the English system, as discussed at the beginning of this chapter).

Therefore, overwhelming evidence supports the notion that grammatical gender is a highly complex system in Welsh, rigged with variation and disparity in both the structure itself, and in its use by individuals. The nature of the input to children, even those learning Welsh as an L1, provides a challenge for children who are acquiring the system. But in the absence of native-speaker input within the home and to a lesser extent out there in the community, to what extent are L2 learners who are largely exposed to the language at school exposed to gender-marked examples, either as natural spoken forms or as formal instruction in class? This is an important question to examine within the context of the current thesis since the focus is on the influence of input on attainment. The next section briefly examines the opportunities for L2 speakers to access direct instruction and examples of gender-marked language within the school curriculum.

3.4 *Grammatical Gender within the Language Curriculum*

Given the irregular and infrequent occurrence of Welsh input for some children coupled with an increase in L2 learners of Welsh, the task falls on education establishments to provide ample native-speaker models and to teach children aspects of grammar such as gender and mutation. Undoubtedly, for many of these children, language input may become domain specific (i.e., for some children Welsh will be reduced to a school-based transmission model) and as such, a closer look at the Welsh language curriculum is important. Formal teaching of ‘wider grammatical concepts’, including noun gender is stated by the Welsh Government (WG) to start during Key Stage 2 and continue into Key Stage 4 (Curriculum for Wales, 2015, p.3). In terms of mutation, children who receive either Welsh-medium or bilingual education are expected to show the following progression, both orally and in writing:

- Year 3 children (age 7-8) are expected to “use the most common mutations usually correctly.”
- Year 4 children (age 8-9) are expected to “use the most common mutations correctly.”
- Year 5 (age 9-10) expected to “mutate correctly after most prepositions and pronouns.”
- Year 6 children (age 10-11) are expected to “mutate correctly after prepositions and pronouns, becoming aware that not every letter follows the usual order.”
- Year 7-11 children (age 13-16) are expected to “use a range of mutations (soft, nasal and aspirate mutations) correctly in context”
(Curriculum for Wales, 2015, p.14; 27; 41).

Thus, it is expected by age 13-14, children attending Welsh-medium/bilingual schools in Wales should be able to mutate correctly, and as a by-product, have knowledge of grammatical gender (although grammatical gender is not isolated as a separate type of morphological structure). It is also worth noting that the language curriculum does not distinguish between expected attainment levels of L1 Welsh children, 2L1 and L2 Welsh children who attend Welsh-medium education. In addition, depending on the school it is not clear whether children learn any ‘in depth knowledge’ of markers of gender at this time. However, the language provision within Welsh-medium and/or bilingual schools vary from school to school, and from teacher to teacher as characterised by Baker (1993) in his notion that there is a “*kaleidoscopic variety of bilingual education practice*” (p.15) in Wales. A recent review of the Welsh curriculum by Graham Donaldson paid due attention to the fact that more needs to be done in order to strengthen children’s Welsh language skills within the school setting, stating, “*there should be a renewed focus in schools on learning Welsh primarily as a means of communication, particularly oral communication and understanding*” (Donaldson, 2015, p.60). However, from the research that has already been conducted in Wales demonstrating clearly how children learning Welsh in various contexts perform qualitatively differently from each other and quantitatively different from the expectations set out in the Welsh curriculum. It is clear that the milestones outlined in the education documents are not research-informed, may not substitute the contribution of home-based transmission, and therefore may disadvantage some children as a result.

3.5 *Summary*

When acquiring a system that does not contain clear form-function mappings, is not always marked consistently in the input, and is transmitted to children under minority language conditions (i.e., where reduced input is highly possible) it is no surprise that children appear to struggle to acquire the system. Given past findings showing that L1

children at age 9 and 11 demonstrate weak knowledge of the system in comparison to adult norms and that 2L1 and L2 children lagged behind L1 speakers at all ages, the present study explored teenagers' knowledge of grammatical gender. The study compared teenagers across two age groups (12/13 and 16/17) and three language groups (L1 Welsh, 2L1, L2 Welsh) and looked specifically at their performance in relation to background language-matched adult norms and at the extent to which L2 children and 2L1 children 'caught-up' with their L1 peers.

3.6 Study 1: Grammatical Gender

3.6.1 Methodology

Participants

Overall, 220 participants took part in this study, 154 teenagers and 66 adult control (see table 3.2). Of the 154, 51 were aged between 12 and 13 years and 103 were aged between 16 and 17. Participants were recruited from bilingual schools, located either in the North West of Wales where 65.4% of the population speaks Welsh, or in the South West, where 43.9% of the population speaks Welsh (Census, 2011). All schools included were what the Welsh Government terms 'Type A' bilingual schools, in which all subjects bar English are taught through the medium of Welsh. Based on the schools' respective Estyn reports, the North-West schools had 75% and 85% of the student population coming from homes where one or both parents spoke Welsh; for the South-West school this number was 79%.

According to the same Estyn reports, pupils at all schools spoke Welsh to a first language level and participants had received Welsh-medium primary education prior to their arrival at secondary school. At the request of the schools, the 12- to 13-year-old participants were tested as a whole class to minimise disruption. They were recruited from the two top sets of Welsh in each school. The 16- to 17-year-old participants were recruited via convenience

sampling and tested as groups. They were separated into language groups based on their responses to the language background questionnaire.

Based on reports by Estyn, two schools had considerably lower rate of free school meals (3.4% and 8.8%) the third school was in a more socially disadvantaged area where 17.7% of children are entitled to free school meals, which is slightly higher than the national average of 17.4%. However, using parental occupation as a measure of SES, a chi-square analysis revealed no significant differences between the backgrounds of children in each bilingual group [Maternal: $p=.252$; Paternal: $p=.377$].

In addition to the younger participants, 66 adult controls were also included in the study. The study was open to all adults who wished to take part, and participants were recruited online through opportunistic sampling. The adult controls came from different areas of Wales and were from different language backgrounds; however, all had to have attended Welsh medium school, both at primary level and secondary level.

Ethical Consideration

The study was granted ethical approval by the College of Business, Law, Education and Social Sciences Ethics Board, and complied with the ethical guidelines for conducting research with children, as outlined in the British Educational Research Association (BERA) and the British Psychological Society (BPS) guidelines. To minimise classroom disruption, opt-out consent was sought from the parents of the 12- to 13-year-olds, that is, if they did not wish for their child to take part in the study then the child's data would be destroyed (see Appendix, A). The 16- to-17-year-olds gave their own consent to take part. The experimenter underwent DBS checks prior to testing, and in the case of the younger age group, the class teacher was also present for the duration of the testing. Each child was given the right to withdraw at any given time, and the data of all participants were anonymised and all names removed from the tests, with each participant given an ID code.

Table 3.2: Participant numbers across age and bilingual groups.

Age	L1 Welsh	2L1	L2 Welsh	Total
12-13	30	9	12	51
16-17	46	31	26	103
Adult	45	9	12	66

Linguistic materials

The items in the grammatical gender task were adapted from Gathercole, Thomas & Laporte (2001) (also presented in Gathercole & Thomas, 2009). Participants were given pairs of sentences, followed by sets of pictures. In the first sentence, the participants were presented with two nouns that were marked for gender e.g.

ia. *Dyma'r **fwyell**_{fem} [*< bwyell*] frown [*< brown*] a dyma'r **gwely**_{masc.} coch.*
 Here is- the – axe- brown- and –here is- the – bed - red.
 “Here’s the brown axe and here’s the red bed”

ii. *Roedd y **drwm**_{masc.} tenau a'r **bêl**_{fem.} [*pêl*] frown [*brown*] mewn boc.*
 Was-the-drum -thin -and -the -ball –brown-in[a]- box.
 “The thin drum and the brown ball were in a box”

In the above examples, two nouns (in bold) are presented, one feminine (*bwyell* “axe” in example ia, and *pêl* ‘ball’ in example iia) marked by mutation on the noun and on the modifying adjective (*frown < brown*) and one masculine (*gwely* “bed” in example ia, and *drwm* “drum” in example iia) presented with a non-mutated adjective (*coch* “red” in example i and *tenau* “thin” in example iia). A second sentence (see examples below) that was related in meaning to the first included distance references to one of the nouns (*bwyell* or *gwely* in example ia or *drwm* or *pêl* in example iia). This distance reference in the second sentence contained either the possessive form *ei* (see example ib), or anaphoric pronoun (see example iib) – *o* (3rd person singular masculine) or *hi* (3rd person singular feminine). The child’s task was to indicate whether the anaphoric reference in the second sentence referred to the feminine or masculine noun in the first. When the possessive *ei* occurred with an AM, this

indicated that the antecedent was feminine (see example ib); if it occurred with SM this indicated the antecedent was masculine.

- ib. *Ond mae ei goes/ei choes wedi plygu*
 But is^{poss} leg_{SM/AM} has bent.
 “But **his/her** leg’s bent.”
 i.e. *ei goes* (*coes* + SM = masc.ANTEC)
 ei choes (*coes* + AM = fem.ANTEC)
- iib. *Ond mi ddisgynodd o/hi drwy'r gwaelod.*
 But did fell^{past} it_(masc/fem.) through the bottom.
 But **it** fell through the bottom.”

There were 30 pairs of sentences with 18 animate nouns (6 human; 12 animal), and 12 inanimate nouns (object). For the animate nouns (animals)/inanimate nouns’, six included the possessive form *ei*, and the other six the anaphoric pronouns. Nouns for humans only included the anaphoric possessive form *ei*, hence why only six items were included. This was because human nouns possess natural gender, and children across the three age groups in Gathercole and Thomas’s (2009) study were hitting ceiling on these items. The sentences presented in the current study deviated slightly from those in the aforementioned study in terms of wording to make them more suitable for teenagers and adults; however, there was no change to the target nouns or their modifying adjectives nor the possessives and pronouns.

Non-linguistic materials

Each sentence was shown in conjunction with two pictures. These pictures were of the referents of the object, human, or animal nouns. In conjunction with the first sentence, these pictorial depictions of the referents were presented as typical pictures of those referents. In conjunction with the second sentence, these pictures were altered to convey the meaning of the sentence – i.e., in relation to example ib above, the axe handle and the one leg of the bed was depicted as having been broken. These pictures were either from windows clip art and edited in order to correctly illustrate the action in the sentence, or were drawn by hand using Windows paint (see appendix B for whole test)

ia. *Dyma'r fwyell_{fem} frown a dyma'r gwely_{masc} coch.*

ib. *Ond mae'i goes wedi plygu.*

“here's the brown axe and here is the red bed”

“but it's leg's bent”



ii. *Roedd y drwm_{mas} tenau_c a'r bêl_{fem} frown mewn boc.*

iib. *Ond mi ddisgynodd hi drwy'r gwaelod.*

“the thin drum and the brown ball were in a box”

“but she fell through the bottom”



Procedure

Participants were given a booklet in which a set of sentences was presented alongside two pictures that corresponded with the nouns in the associated sentences. One picture corresponded a masculine antecedent and the other a feminine antecedent. The participants were then asked, in Welsh, to circle which picture they thought the second sentence referred to.

Scoring

For each correct selection, participants were given a score of 1; for each incorrect answer they were given a score of 0.

Predictions

Based on previous findings in the literature, the following predictions were made in relation to teenagers' performance on the task:

- There would be an improvement in teenagers' ability to identify gender with age within each language background group.

- Due to the complex and inconsistent nature of the system, any convergence in ability across language groups would be weak.
- In line with previous results, performance would be stronger at identifying co-referential pronouns denoting masculine than feminine nouns.
- In line with previous results, performance on nouns for humans would outweigh performance on nouns for inanimates with performance on nouns for animals somewhere in-between.

3.7 Results

3.7.1 General Results

A 2X3 Univariate ANOVA was conducted to establish the relationship between the teenagers' grammatical gender knowledge (DV), bilingual group (L1W, 2L1, L2W), and age (12-13, 16-17). Contrary to prediction, the analysis revealed no main effect of Age [$p=.506$], suggesting that the performance of the older bilinguals was not significantly higher than the younger bilinguals. There was, however, a main effect of Bilingual Group [$F(2, 148)=7.298$, $p=.001$]. Bonferroni post hoc analyses found that this effect was due to the L1W bilinguals outperforming the 2L1 [$p=.027$] and L2W bilinguals [$p=.000$]. Interestingly, there was no difference between 2L1 and L2W bilinguals [$p=.675$], suggestive of a 'catch-up' between these two groups (see table 3.3). As can be seen from table 3.3, teenagers' performance was above chance (50%) in all cases, but, even at 16-17 years of age, performance had not reached adult norms for any language group. In order to identify potential patterns of catch-up within the age groups further analyses were conducted on the data set.

Table 3.3: Mean percentage score and Standard Error on Grammatical Gender task.

Bilingual Group	12-13		16-17		Adult	
	Mean	SE	Mean	SE	Mean	SE
L1 Welsh	72.11	3.16	76.74	2.66	85.23	2.08
2L1	62.96	4.06	67.31	3.24	77.41	5.21
L2 Welsh	63.61	4.25	60.90	2.67	85.00	5.77

A One Way ANOVA analysis found that there was no main effect of Bilingual Group within the 12-13 age group, with all performing at comparable levels [$p=.153$]. This was not the case for the 16-17 age group, with a main effect of Bilingual Group found [$F(2, 100)=7.698, p=.001$]. This was due to the L1W bilinguals outperforming the L2W bilinguals [$p=.001$], there were no significant differences between the 2L1 and L2W bilinguals [$p=.675$] and the 2L1 and L1W bilinguals [$p=.057$]. The gap between the 12-13 and 16-17 groups was similar for both the L1W and the 2L1 children (4.63 mean percentage difference for L1W; 4.35 mean percentage difference for 2L1). However, the gap between the performance of the 12-13 and 16-17 groups was slightly smaller, but reversed (i.e., -2.71 difference in favour of 12-13 for L2W). Since the progression that is seen in the performance of older children from L1W and 2L1 backgrounds is not seen among the L2W cohorts, this suggests that there may be other factors at play influencing children's progression. These will be discussed further in Chapters 6 & 7.

Adults

The adult data were analysed separately, due to the uneven numbers of participants. A One Way ANOVA revealed no main effect of Bilingual Group, [$p=.371$] which could suggest that by adulthood differences between the three age groups do disappear. However, given the differences in sample sizes it is probable that these results may differ with a larger 2L1 and L2W sample. This issue will be discussed more in Chapter 7.

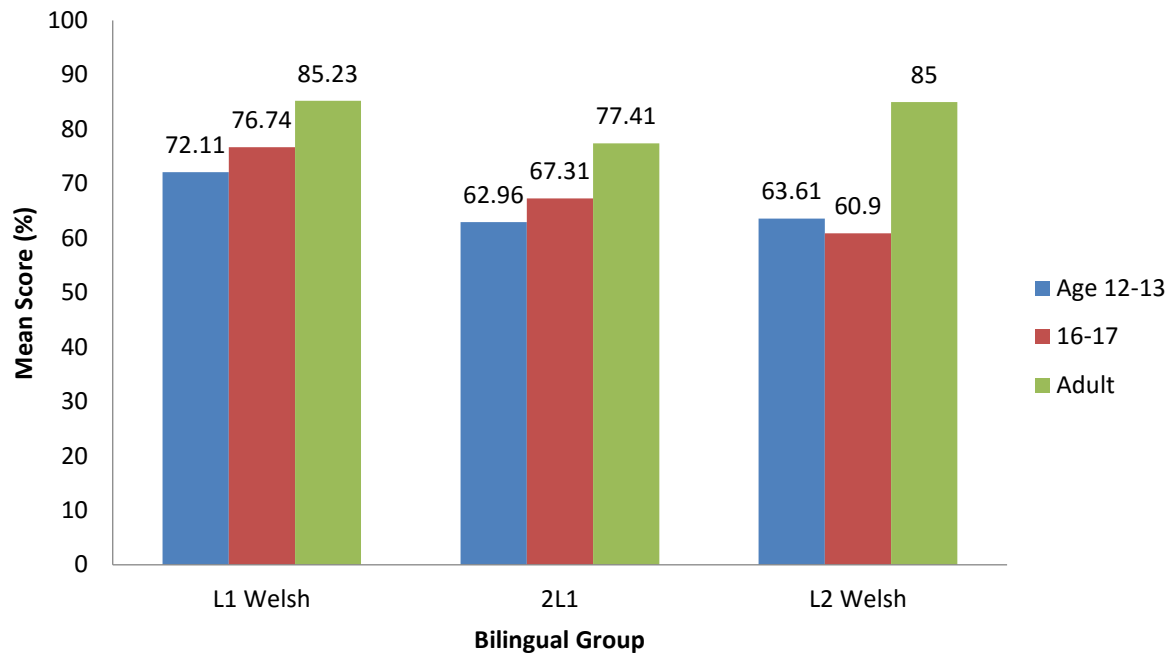


Figure 3.1: Performance of teenagers and adults from each bilingual group on the Grammatical Gender task.

3.7.2 Further Analysis

A Further, separate set of analysis was conducted in order to look at the performance of the teenagers on specific factors, including Gender and Marker [pronoun/possessive vs. masculine/feminine] and Noun Animacy [human, animal, or object]. The results are as follows:

Animacy X Bilingual Group X Age

Firstly, an analysis was conducted to establish if the performance of the participants in the three bilingual groups (L1W, 2L1, L2W) and in the two age groups (12-13, 16-17) differed depending on Noun Animacy (human, animal, or object). A 3X3X2 Repeated Measures ANOVA was conducted on the data, with Animacy as the within-subjects IV and Bilingual Group and Age as the between subjects IVs. Results revealed a significant effect of Noun Animacy [$F(2, 296)=33.475, p=.000$], which was due to the performance on nouns for humans being significantly higher in comparison to both nouns for animals [$p=.000$] and nouns for inanimate objects [$p=.000$]. Performance on nouns for animals was significantly higher in comparison to nouns for inanimate objects [$p=.023$]. These results are as predicted,

and follow the same pattern that was found in the performance of younger children in Gathercole & Thomas, (2009) and Gathercole et al. (2001). There were no interaction effects between Noun Animacy X Age [$p=.966$] or Noun Animacy X Bilingual Group [$p=.258$], suggesting that older and younger participants from each bilingual group yielded similar patterns of performance (see Figure. 3.2).

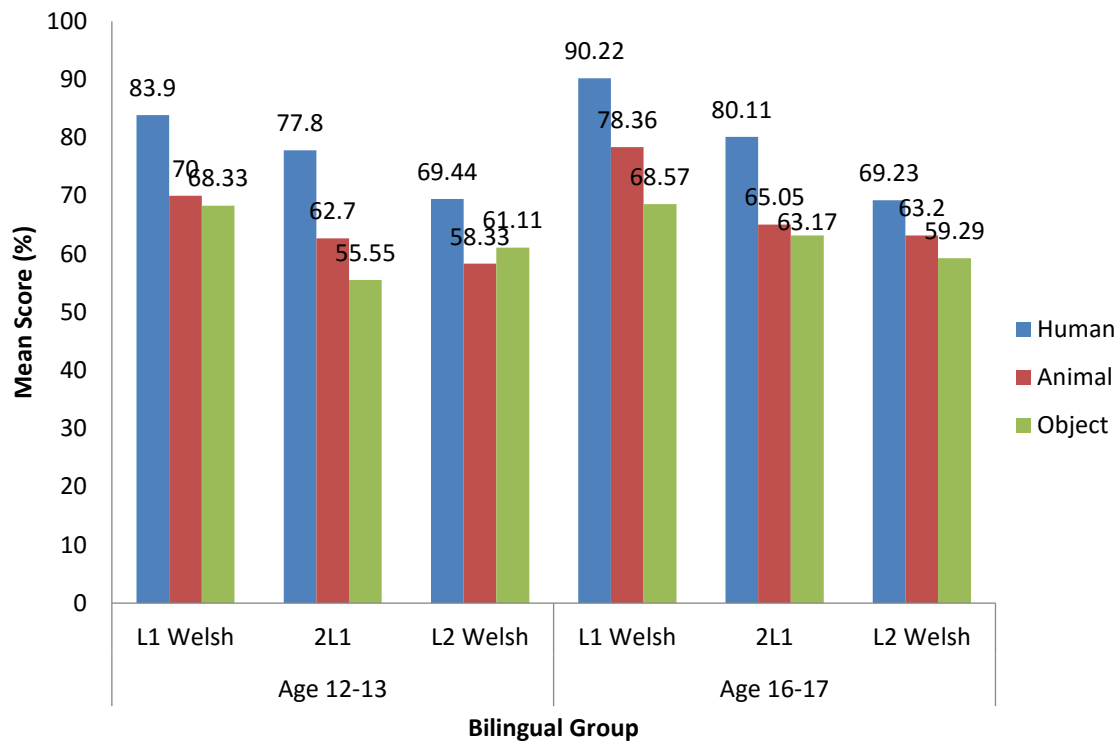


Figure 3.2: Mean per cent correct depending on Noun Animacy (Human, Animal, Inanimate)

Noun Gender X Bilingual Group

A 4 X 2 X 3 Repeated Measures ANOVA Analysis was conducted on with Bilingual Group (L1W, 2L1, L2W) and Age Group (12-13, 16-17) as between subjects IV and Gender Agreement Type (*fo* + masc.; *hi* + fem.; *ei* + masc.; *ei* + fem) as within subjects IV. Results revealed a highly significant main effect of Gender Agreement Type [$F(3, 444)=13.747$, $p=.000$] with both the younger and older teenagers across all bilingual groups performing alike. Children correctly chose *ei* + AM as associated with a feminine possessor more often than they chose *ei* + SM as associated with masculine items [$p=.001$]. Likewise, performance on feminine-marked pronouns were significantly stronger in comparison to masculine-

marked pronouns [$p=.000$]; however, the mean difference between the feminine and masculine pronouns was smaller in the older age group [Masc: $M=64.08$; Fem: $M=69.58$]. Overall, the participants were stronger on feminine items [$M=72.86$] in comparison to masculine items [$M=66.02$] on this task. This result is interesting in light of previous findings that children's knowledge of masculine gender precedes their knowledge of feminine noun gender in Welsh.

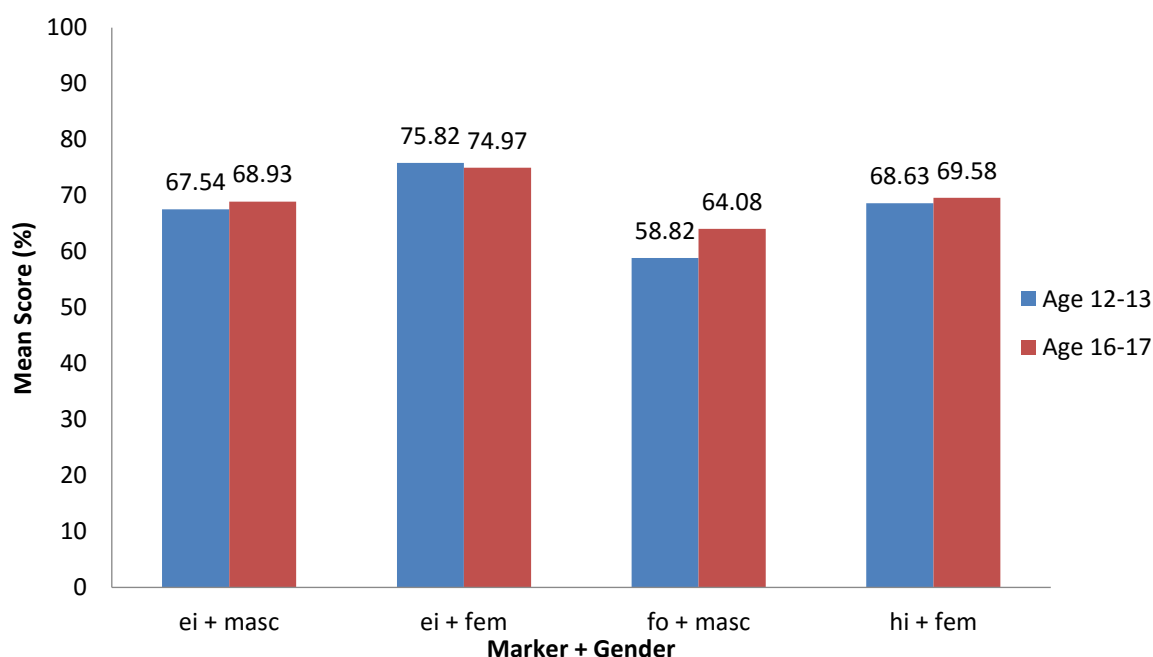


Figure 3.3: Mean per cent correct depending on Marker (pronoun: *fo* vs. *hi* and possessive: *ei* masc. vs. *fem.*) and Noun Gender.

3.8 Summary

In conclusion, it is clear that grammatical gender is a system that takes a long time to be acquired, with no long-term catch-up seen across speakers from various language backgrounds. While, a catch-up was seen within the 12-to 13-year-old group, this was result was not replicated within the older 16- to 17-year-olds, with the L1W continuing to outperform the L2W bilinguals. The implications of this study will be discussed in more detail in Chapter 7. The next chapter will go on to introduce the Welsh plural system and present findings in relation to teenagers' acquisition of the Welsh plural system.

Chapter 4: Teenagers' Acquisition of the Welsh Plural System

This chapter will present the grammatical properties and morphological complexities of the Welsh plural system, and how input relates to its acquisition. This chapter will also present data exploring the performance of teenagers, aged 12-13 and 16-17, on their knowledge of plural morphology, with the aim of establishing whether 'catch-up' has occurred with increased input to this system over time.

4.1 *The Welsh Plural System*

Welsh employs an interesting process of modifying noun number. The process is based around two systems: the singular/plural system (sg./pl.) and the collective/unit system. The pluralisation process of the sg./pl. system generally involves the addition of a plural suffix onto a singular stem. This system mirrors that of the plural system seen in some European languages including English (see King, 2003, for more detail). The collective/unit system, on the other hand, involves the reverse process of suffix deletion, which is an infrequent process across languages.

i. Singular/plural system

The process of forming a plural form of a noun in Welsh is far more complex than in other languages such as English where (bar a few well-known exceptions) the plural is almost universally *-(i)(e)s* (King, 2003), and is more similar to languages such as German in terms of its complexity. There are two main principles involved within the singular/plural system in Welsh: the addition/deletion/substitution of endings, and internal vowel change. These two principles can be used independently or in combination (Thorne, 1993; King, 2003), for example:

sg.	<i>cath</i> [kɑ:θ] "cat"	-	pl. <i>cathod</i> [kɑ:θod] "cats"
sg.	<i>llyfr</i> [lɛvər] "book"	-	pl. <i>llyfrau</i> [lɛvrɑi] "books"

ii. Collective/Unit System

However, a closed set of nouns does not fit into the sg./pl. system. Contrary to the sg./pl. system, in the c/u system the singular is formed from the plural (Roberts & Gathercole, 2006). That is, instead of adding a plural suffix to a singular stem, the singular suffix is deleted to mark the plural (King, 2003; Thorne, 1993). The closed set of nouns affected by this system comprises mostly of nouns denoting living things, which tend to belong in a group. For example:

sg.	<i>mochyn</i> [mɔːχɪn]	-	pl.	<i>moch</i> [mɔːχ]	“pigs”
sg.	<i>coeden</i> [kɔːden]	-	pl.	<i>coed</i> [kɔːd]	“trees”

Plurals that are formed this way are a much smaller group in comparison to those formed via the addition of a suffix and is used quite often in nouns for animals. The group also includes a large proportion of feminine nouns, often denoted by the *-en* sg. suffix. Fewer masculine nouns are found in this group, which are often denoted by the *-yn* sg. suffix, for example:

Fem.	sg.	<i>llygoden</i> [lɛgɔːden]	-	pl.	<i>llygod</i> [lɛgɔːd]	“mice”
	sg.	<i>deilen</i> [deɪlɛn]	-	pl.	<i>dail</i> [daɪl]	“leaves”
Masc.	sg.	<i>aderyn</i> [adɛrɪn]	-	pl.	<i>adar</i> [adɑː]	“birds”
	sg.	<i>blewyn</i> [bleuɪn]	-	pl.	<i>blew</i> [bleu]	“fur”

(For a full list of examples, see King, 2003.)

4.1.1 Plural Formation

If one takes into account both systems together, there are 8 different ways of forming a plural in Welsh:

- i. Where a plural suffix is attached to a singular stem (+suff), with minimal sound changes (bar the shortening of vowel length):

e.g.	sg.	<i>cath</i> [kaːθ]	-	pl.	<i>cathod</i> [kaθɔːd]	“cats”
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- ii. A plural suffix is attached to a singular stem, but the noun also undergoes a vowel change (+Suff+V):

e.g. sg. *cadair* [kadar] - pl. *cadeiriau* [kadɛɪriɑ] “chairs”

- iii. The singular suffix is deleted to denote the plural, as noted above (-Suff):

e.g. sg. *mochyn* [mɔχɪn] - pl. *moch* [mɔ:χ] “pigs”

- iv. The singular suffix is deleted, but the noun also undergoes a vowel change (-Suff+V):

e.g. sg. *plenty*n [plɛntən] - pl. *plant* [plant] “children”

- v. The singular suffix is alternated with a plural suffix (~suff):

e.g. sg. *blodyn* [blɔdən] - pl. *blodau* [blɔdaɪ] “flowers”

- vi. The singular suffix is alternated with a plural suffix with a vowel change (~suff + V):

e.g. sg. *deigryn* [dɛɪgrən] - pl. *dagrau* [dagraɪ]
“leaves”

- vii. The penultimate vowel, or the first and penultimate vowel undergoes change to denote the plural (V):

e.g. sg. *castell* [kastɛl] - pl. *cestyll* [kɛstɔl] “castles”

- viii. The plural is not related to the singular form (Supplative):

e.g. sg. *ci* [ki] - pl. *cŵn* [ku:n] “dogs”

4.2 Plural Suffixes

Welsh has 12 plural suffixes (Thorne, 1993). The most common of these suffixes is –(i)au, and is usually the suffix of choice for the plural form of new words and words borrowed from the English language (King, 2003). The suffixes –od; -oedd; -(i)on; -ydd; and

–i are common also (King, 2003; Thomas, 1996). Some examples of nouns pluralised with these suffixes are shown in table 4.1:

Table 4.1: Adapted from Thorne (1993): List of different plural suffixes in Welsh.

Suffix	Sg.	Pl.	English
-au	<i>llong</i>	<i>llongau</i>	“ships”
-iau	<i>cadair</i>	<i>cadeiriau</i>	“chairs”
-od	<i>llwynog</i>	<i>llwynogod</i>	“foxes”
-i	<i>pêl</i>	<i>pelï</i>	“balls”
-on	<i>awel</i>	<i>awelon</i>	“breeze”
-ion	<i>gorwel</i>	<i>gorwelion</i>	“horizons”
-oedd	<i>môr</i>	<i>moroedd</i>	“seas”
-ydd	<i>afon</i>	<i>afonydd</i>	“rivers”
-edd	<i>ewin</i>	<i>ewinedd</i>	“nails”
-ed	<i>merch</i>	<i>merched</i>	“girls”
-aint	<i>gof</i>	<i>gofaint</i>	“blacksmiths”
-iaid	<i>estron</i>	<i>estroniaid</i>	“foreigner”

Since there are not many obvious features within the singular noun that predicts appropriate plural suffix the plural system in Welsh is a relatively opaque one. However, there are some patterns that help predict plural form in some closed sets of nouns. Examples are presented below:

i. –(i)au

The most common suffix, *-au*, is predictably applied to nouns that end with the singular suffix *-iad*, or *-aeth* (e.g., sg. *goriad* - pl. *goriadau* “keys”; sg. *trafodaeth* - pl. *trafodaethau* “discussions”) although nouns denoting persons or people take *-ion* or *-iaid* (sg. *cariad* - pl. *cariadon* “lovers”; sg. *pennaeth* - pl. *penaethiaid* “headteachers”); *-au* is also used for feminine nouns that end in the singular suffix *-es* (e.g. sg. *tywysoges* - pl. *tywysogesau* “princess”, sg. *brenhines* - *breninesau* “queens”), and abstract nouns ending in *-deb* (e.g., sg. *disgleirdeb* - pl. *disgleirdebau* “brilliance”) (King, 2003). However, these are mostly instances, and the number of nouns taking *-au* as a suffix that have no clear singular noun

form exceed this rule⁹ (e.g. sg. *ffrwyth* - pl. *ffrwythau* “fruits”; sg. *afal* - pl. *afalau* “apples”; sg. *llyfr* - pl. *llyfrau* “books”). A common form of the suffix *-au* is *-iau*. Singular nouns which can be predicted to take the plural suffix form *-iau* are usually verbs which end in the singular suffix *-(i)ant* where the final *-nt* changes to *-nn* (e.g. sg. *llwyddiant*, - pl. *llwyddiannau* “success”). However, here, again, nouns that take *-iau* as a plural suffix is not confined to this rule¹⁰ (e.g. s.g. *esgid* - pl. *esgidiau* “shoes”; sg. *llun* - pl. *lluniau* “pictures”) (Thorne, 1993).

ii. *-(i)on*

The form *-ion* tends to be more frequent than *-on*. The use of this suffix can be predicted by nouns ending in *-og* (e.g. sg. *swyddog* - pl. *sywddogion* “officer”) or *-or* (e.g. sg. *canghellor* - pl. *cangellorion* “chancellor”) which generally denote a person. Those denoting inanimate objects or entities take different forms (*ceiniog* – *ceiniogau* – ‘coins’; *cysgod* – *cysgodion* ‘shadows’). Nouns ending in *-ydd* will usually take the pl. *-ion* (e.g. sg. *cadeirydd* - pl. *cadeiryddion* “chairmen”).

iii. *-i*

The suffix *-i* is applied to a limited class of common nouns. A large number of nouns that are marked for plural with an *-i* are feminine (e.g. sg. *allwedd* - pl. *allweddi* “keys”; *pêl* – *pelî* ‘balls’). Nouns that pluralise with *-i* are likely to include an internal vowel change, especially *-a-* to *-e-* or *-ei-*. The penultimate vowel in the sg. is normally an *-e-*, however, an *-a-* is possible which will change to an *-e-* in the pl. (e.g. sg. *cawr* - pl. *cewri* “giant”). If the final vowel is the diphthong *-wy-* then it remains unchanged (e.g. sg. *llwyn* - pl. *llwyni* “grove”). However, as can be seen from the examples above, there is no clear pattern emerging in terms

⁹ In some nouns, the final *-nt* of the noun changes to *-nn-* before the addition of *-au* as a plural suffix.

¹⁰ Sg. nouns which end in *-i* will take *-iau* or *-ion*, diacritic markers signify the *-i-* is a part of the sg. noun and not of the pl. suffix, e.g. sg. *stori* - *storiâu* “stories” (King, 2003)

of the form of the singular noun that would make it clear that these take *-i* as their plural marker, other than the fact that many such singular nouns have *-e-* in the stem.

iv. *-edd*

The suffix *-edd* applies to a small group of common nouns (e.g. sg. *bys* - pl. *bysedd* “fingers”), some of which also involve an internal vowel change (e.g. sg. *gwraig* - pl. *gwragedd* “wives”).

v. *-oedd*

The suffix *-oedd* is more common than *-edd* and *-ydd*, but is applied to less common nouns in speech (e.g. sg. *llys* - pl. *llysoedd* “courts”; sg. *môr* - pl. *moroedd* “sea”). Internal vowel change is rare; however, a few common nouns may be modified in other ways (e.g. s.g. *blwyddyn* /bluədən/ - pl. *blynnyddoedd* /blənəðɔɛð/ “years”). A closed set of Sg. nouns ending in *-fa* will tend to take the pl. *-oedd* (e.g. sg. *cynulleidfa* - pl. *cynulleidfaoedd* “audience”).

vi. *-ydd*

Similar to *-edd*, *-ydd* is a limited class, albeit affecting some common nouns (e.g. sg. *afon* - pl. *afonydd* “rivers; sg. *cawod* - pl. *cawodydd* “showers”). Nouns that take this suffix are less likely to undergo an internal vowel change and are largely different from one another in form.

vii. *-od*

After *-(i)au*, *-od* is considered one of the most commonly applied plural suffix. The suffix *-od* is typically applied to many nouns for animals, including birds and fish (e.g. sg. *crwban* - pl. *crwbanod* “turtles”; sg. *gwylan* - pl. *gwylanod* “seagulls”). However, this is not exclusively the case (e.g., *hebog* — *hebogau/hebogiaid* ‘hawks’; *eog* - *eogiaid* ‘salmons’) and *-od* is also used in conjunction with some nouns for humans (e.g. Sg. *baban* - pl. *babanod* “babies”), and nouns denoting nationality, (e.g. sg. *Gwyddel* - pl. *Gwyddelod* “[the] Irish”). Some inanimate nouns also take this suffix (e.g. sg. *cwch* - pl. *cychod* “boat”).

viii. *-ed*

Only two common nouns take this plural suffix: sg. *merch* - pl. *merched* “girls” and sg. *pry(f)* - pl. *pryfed* “insects”.

ix. -*iaid*

Similar to the suffix *-od*, *-iaid* is also associated with some animal nouns, but it is associated mainly with nouns for humans, nouns denoting nationalities, tribes and professions (e.g. sg. *doctor* - pl. *doctoriaid* “doctors”), and a doer or an action that possess the singular suffix *-adur* (e.g. Sg. *ffoadur* - pl. *ffoadurion* “refugees”). Some animal nouns that use this suffix undergo an internal vowel change (e.g. sg. *Anifail* - pl. *anifeiliaid* “animals”).

x. -*aint*

Similar to the suffix *-ed*, *-aint* only affects a few nouns in spoken Welsh, but these nouns are relatively uncommon in the spoken language. Some nouns will undergo an internal vowel change in conjunction with this suffix (e.g. sg. *gof* - pl. *gofaint* “blacksmiths”; sg. *nai* - pl. *neiaint* “nephews”).

4.2.1 Internal vowel change

As stated earlier in the chapter, a common form of pluralisation in Welsh involves phonological changes on a combination of internal vowel changes that occur either on the first vowel, or in combination with the penultimate vowel. These can occur in conjunction with the addition or alternation of the plural suffix, or deletion of the singular suffix, or as a stand-alone change. The process involves converting a back vowel (“a” /a/, “o” /ɔ/, and “w” /u/) into front vowels (“e” /ɛ/, “i” /i/, and “y” /ə/). This process is similar in some respect to limited English instances, e.g. *man* – *men*; however, is it far more common in Welsh. There are generally two categories for this plural type where the sound change is predictable depending on the vowels present in the noun (King, 2003):

i. Nouns where only one vowel changes:

For this type, there are three main patterns of alternating sound pairs:

-a- - -ei- [e.g. sg. *bardd* /bɑrð/ - pl. *beirdd* /bɛirð/ “poet”]

-a- - -ai- [e.g. sg. *llygad* /lɛɡad/ - pl. *llygaid* /lɛɡaid/ “eye”]¹¹

-o- - -y- [e.g. sg. *corff* /kɑrf/ - pl. *cyrff* /kɛrf/ “body”]

However, there are many exceptions – e.g., *carn* – *carnau* ‘hoofs’ not **cyrn*; *torth* -- *torthau* not **tyrth* ‘loaves’).

There are some miscellaneous single vowel changes that do not fit into the above type also, but are exceptions rather than the rule [e.g. sg. *troed* /trɔɛd/ - pl. *traed* /traɛd/ “feet”; sg. *oen* /ɔɛn/ - pl. *ŵyn* /u:ən/ “lambs”] (Thorne, 1993).

ii. Nouns where two vowels in consecutive syllables change.

This second type forms the plural from two consecutive vowel changes, one per syllable.

Generally, it involves the following change patterns¹²:

–a- -a- - -e- -y- [e.g. sg. *alarch* /alɑrχ/ - pl. *elyrch* /ɛlɑrχ/ “swans”]

–a- -e- - -e- -y- [e.g. sg. *pabell* /pabɛl/ - pl. *pebyll* /pɛbəl/ “tents”]

–a- -e- - -e- -i- [e.g. sg. *carreg* /kɑrɛg/ - pl. *cerrieg* /kɛrɪg/ “rocks”]

While these phonological changes are in some respects predictable based on the vowel sound in the noun stem, they cannot be applied across all nouns, for example, *llygad* - *llygaid* not *llygad* - *llygyd* “eyes” (Thomas, 1996). Therefore, children’s abilities to acquire knowledge of nouns which pluralise through internal vowel changes may be guided to some extent by phonological cues and rules as shown above. However, given that the items that follow these rules tend to be a small close group, one would expect that children would acquire these items item-by-item rather than in any systematic way (Thomas, et al. 2014).

¹¹ When –ai- is in a monosyllabic noun, for example, in *brain* (“crows”), the pronunciation is as written. However, in a polysyllabic noun, for example, *llygaid* the –ai- tends to be pronounced –e- or –a- in everyday speech.

¹² There are also some miscellaneous two-vowel changes, that don’t follow the established vowel change rule. These are: i. sg. *asgwrn* “bone” - pl. *esgyrn*; ii. sg. *dafad* “sheep” - pl. *defaid*

4.2.2 *The English Plural Suffix –(y)s*

In some cases, the English plural suffix *–(i)(e)s* can be used to pluralise some single Welsh nouns, sometimes appropriately (e.g., *brwsh* “brush” – *brwshis* “brushes”) and sometimes in lieu of the Welsh suffix (sg. *babi* - pl. *babis* “babies” instead of *babanod*) (King, 2003). It is more common for some English loan words to retain their English plural (King, 2003), although written using Welsh spelling (e.g. sg. *bws* - pl. *bysys* “bus”; sg. *nyrs* - pl. *nyrsys* “nurse”). However, there are instances of English loan words adopting a Welsh suffix¹³ (e.g. sg. *camera* - pl. *camerâu* “cameras”; sg. *tablet* - pl. *tabledi* “tablets”).

The use of the English suffix *–s* used in lieu of the correct Welsh suffix is quite a common occurrence in everyday speech, especially with English dominant bilinguals. A study analysing the use of plural forms within a corpus of adult spoken Welsh discovered that following the suffix addition (+suff), the most prominent plural type was the use of English cognates (*–s* ending), with occurrences of this plural being at 17.28% of instances in the corpus (Thomas, et al. 2014). Additionally, 226 forms (21.92% of the total sample items) from the corpus sample were loan words; however, out of these forms 22 had Welsh plural forms (*artists* - *artistiaid*), with the remainder formed by using the English *–s* (Thomas, et al. 2014). However, when speakers pluralise using the English *–s* instead of the Welsh suffix, it is difficult to know whether the Welsh form of the noun is being “Anglicised” or the noun is being used as an English borrowing by the speaker.

4.2.3 *Irregular and Miscellaneous plurals*

There is another, small group of nouns that do not fit into any of the conventional types; these are referred to as “suppletives” in Thomas et al.’s study. The nouns that take these suffixes tend to be uncommon and of a small number: if we treat *–yr* as a suffix, the only words that

¹³ If the loanword ends in *–a*, the pl. suffix will be *–âu* (e.g. sg. *drama* - *dramâu* “dramas”), for the same purpose as *ï* (King, 2003).

take *-yr* are sg. *brawd* “brother” - *brodyr*; *gwayw* “pang/pain” - *gwewyr*; *gŵr* “man” - *gwŷr*. Out of these instances, *brodyr* is the only word that is common in everyday speech. However, what is not clear is whether *gwyr* is a product of the addition of the *-yr* suffix or of an internal vowel change *-w-* - *-wy-*. Similarly, for *gwayw* - *gwewyr*, it is possible that *-ay-* undergoes an internal vowel change *-ew-* then sees the addition of the suffix *-yr*. The other suffix *-en* is more commonly associated with singular forms of nouns [e.g. *awyren* “aeroplane”, *coeden* “tree”] as a plural it only seems to be associated with one uncommon noun [sg. *ych* “ox” - pl. *ychen*], thus *-en* may be an exception. However, very common words such as: sg. *ci* “dog” -- pl. *cŵn* “dogs”; sg. *llaw* “hand” - pl. *dwyllo*¹⁴ also seems to be irregular plurals, as they do not match any previously mentioned rule (King, 2003).

Syllable dropping in the Plural

Other irregular forms see the noun dropping a syllable in the formation of the plural, for example: sg. *cymydog* - pl. *cymdogion* “neighbours”; sg. *gorchymyn* - pl. *gorchmynion* “orders”.¹⁵

Derivative of the singular

There are plurals which are formed from a derivative of the singular, often ending in the suffix *-(i)ad*; for example: sg. *diwedd*+*iad* “end” - pl. *diweddiadau* “ends”; sg. *dosbarth*+*iad* “class” - pl. *dosbarthiadau*.

Miscellaneous Characteristics

In Welsh, some singular nouns may have more than one meaning, where their meaning is disambiguated through forming different plurals. For example, the noun *llwyth* has two meanings, “tribe” plural *llwythau* or “load” plural *llwythi* (see King, 2003, for more

¹⁴ *Dwylo* “hands” has been formed following a special dual form of denoting ‘two’ rather than a standard plural of ‘many’, thus these are created from the element *deu-* or *dwy-* “two” + noun (King, 2003). Other instances include, *dydd* “day” - *deuddydd*, which denotes the period of two days.

¹⁵ *Hosan* “sock” is an interesting and unusual example of this instance, with the first syllable being dropped to form *sanau* “socks” rather than *hosanau* or the dropping of an internal syllable.

examples). Another interesting characteristic about the plural system in Welsh is some nouns do not have a singular form, and are used only as a plural, for example *gwartheg* “cattle”; *pigion* “selections”.

4.3 Acquisition of the Welsh Plural System

4.3.1 Issues of complexities

From the discussion presented above, it is clear that the Welsh plural system is relatively opaque in so far as there are no clear one-to-one correspondences between singular form and the eventual plural form that it takes, but some patterns do exist that may support the development of certain aspects of the system. In relation to these patterns, one could suggest that plural formation is based on phonological stress; however, this is not mentioned specifically in the literature (King, 2003; Thorne, 1993; Thomas, 1996) and the plural formation that is most likely to be influenced most by phonological stress are the changes that involve an internal vowel change (Thomas, 1996), but these are applied less frequently as the sole pattern of pluralisation and when in combination with suffix addition the phonological form does not usually indicate the appropriate suffix to use.

Multifunctionality of endings

To make the system more complex, in Welsh, there are only two suffixes, *-au* and *-oedd*, which function solely as markers for plural. However, while *-au* is the most common plural marker in the Welsh language, *-oedd* affects much fewer nouns. Excluding *-au* and *-oedd*, other plural forms (see table 4.2) share their function with other grammatical aspects, for example:

- i. *-ydd*

Singular nouns that denote a person or an object share suffix, for example, *cogydd* “cook” or *gobennydd* “pillow”. Some abstract nouns also use this suffix for example, *llawenydd* “joy”.

ii. *-i*

Abstract nouns also end with *-i*, e.g. *diogi* “laziness”, and a number of infinitives also share this phonological ending e.g. *golchi* “to wash”; *gweiddi* “to shout”.

iii. *-(h)áu*

Nouns that can be used nominally and as infinitives take this form, e.g. *agosáu* “to approach”; *lleiháu* “to shrink”.

iv. *-od*

Monosyllabic singular nouns often end in *-od* e.g. *tafod* “tongue”, *cawod* “shower” and mass nouns like *tywod* “sand”.

4.4 Previous Research on Plural Systems

Possibly one of the most recognised psycholinguistic test measuring children’s morphological knowledge is the *Wug* test (Berko, 1958). Berko suggested that children would be able to produce the correct plural suffix for a nonsense word based on the phonological properties that require the suffix *-s*, *-es*, or *-ies*, consistently as they would for real words. She found that children were the most consistent on what she deemed as the least phonologically complicated allomorphs (*/-z/* rather than */-ɪz/*). Generally, English-speaking children are able to produce the expected English plural morphology around 90% of the time (Brown, 1973), and by age 4, less frequent allomorphs are been said to be acquired (Berko, 1958). Similarly, Spanish-speaking children also display an ability to produce frequent plural forms at age 2 (Marrero & Aguirre, 2003), and less frequent forms by age 4 (Ferenz & Prasada, 2002).

The early acquisition of English and Spanish plural morphology is in stark contrast to the acquisition of Welsh plural morphology. However, comparing children’s acquisition of the plural system in Welsh to that of children acquiring other languages that have arguably far more simple systems is misleading, given the complexity of the Welsh plural system. With this

in mind, it is unlikely that children will acquire the system by age 4, as is expected of English and Spanish.

4.4.1 Research on Welsh Plural Morphology

Currently the only study looking directly at the acquisition of plural morphology in Welsh is Thomas et al. (2014). Thomas et al.'s study assessed expressive knowledge of plural morphology in 7- to 11-year-old children. The study compared the performance of three types of Welsh-English bilinguals – those who were L1 Welsh, those who were 2L1 bilinguals, and those who were L2 Welsh bilinguals. The results revealed that for more transparent plural forms, such as the addition of a plural suffix, the L1 children were averaging scores of 86.11%. For more opaque forms, such as those including a vowel change, performance ranged between 57.85% and 85.39% for these children. Performance of the 2L1 and L2 Welsh children was significantly lower, with scores on the transparent items at 58.41% for the 2L1 and 45.61% for the L2 children, suggesting that they were far behind the L1 Welsh children in their acquisition of the more transparent plural forms.

The lag found in the 2L1 and L2 Welsh children is unsurprising given the research highlighted in Chapter 2, which found acquisition of grammar to be highly reliant on the linguistic input children receive. Thus we can deduce that the acquisition of plurals follows the same pattern. It is suggested that the complexity of the plural forms could also affect acquisition rate. The acquisition of transparent plural forms is expected to occur quicker and with more ease in comparison to the more opaque plural forms that include a vowel change. Looking at the acquisition of individual plural forms, it is logical to assume that the easiest plural form to acquire would be the +suff form, given its frequency in the input. However, given its frequency in the input, it would be reasonable to assume that this form will be the most likely to be overgeneralised too. Similarly, we should expect the suffix *-(i)au*, given its frequency in the input, to be the most easily identified as a plural suffix and thus to be the

most commonly overgeneralised, adults included (Thomas, 1996). Indeed, Thomas et al. (2014) found that children aged between 7-8 and 9-11 were performing more accurately in general on +suff plural forms, regardless of language background. This was unsurprising given its frequency in the input. It could be argued that in the case of L2 Welsh children, since its construction is akin to the simpler English system, this makes it easier for them to learn.

Unremarkably, the *-(i)au* suffix was also the most overgeneralised in the errors made by all children in Thomas et al.'s (2014) study, regardless of language background. In fact *-(i)au* accounted for 28.84% of errors by L1 Welsh children, increasing to 41.67% for 2L1 children, and 55.57% for L2 Welsh children. However, the distinctly higher instances of overgeneralisation by 2L1 and L2W children begs the question whether they use *-(i)au* because it is the most frequent in the input, or that they have not come across enough examples of the other suffixes in the input to identify them as possible plural suffixes. Whilst the Thomas et al. study cannot answer this question, what they did conclude is that the use of other suffixes shown in the error patterns of all children does suggest that the children are demonstrating a developing knowledge of the various aspects of the plural process by which plurals are formed in Welsh.

However, at age 11 they remain unsure of the exact process in relation to a particular word. It is important to note also that only four children overgeneralised *-(i)au* over 80% of the time, suggesting that it is not used exclusively. Whether or not the number of +suff and *-(i)au* overgeneralisations will be reduced in the teenage data would be interesting to see, as well as whether 2L1 and L2W children have by that point received enough exposure to the other plural suffixes and forms to have internalised the system's grammatical properties enough to apply them to unfamiliar singular words.

It is likely for plural forms that include an internal vowel change, either with or without an alternation or deletion of the suffix, to be the most problematic to acquire. This is probable due to the unpredictable nature of the form (Thomas, 1996), thus successful acquisition of plurals that include a vowel change is highly reliant on frequent and correct use in the input. Children in Thomas's study did perform worse on the plural forms that required vowel changes in comparison to the forms that did not require an internal vowel change. However, some errors did involve some type of change in the stem, albeit not in the appropriate manner. Most of these attempts were found for +suff+V plurals, with error patterns suggesting that children are aware of the sound changes for the formation of some plurals, however they are yet to fully acquire the system due to the limited nature of the input.

Overall, the nature of the errors produced by the children in the study showed that they did possess some knowledge of the underlying properties of the plural system in Welsh; however, they were yet to apply these forms correctly across-the-board. This suggests that successful acquisition of the different suffix types is contingent to some extent on frequency of the children's exposure to these items. Therefore, whether or not full acquisition of the system does happen, and at what point, is yet to be determined. However, in situations where frequency of exposure is an issue, it is possible that there is a risk that acquisition might be 'timed off the map' (Gathercole & Thomas, 2009), as discussed in Chapter 2. Given Thomas et al.'s results, the question remains as to whether the gap between speaker groups will reduce during adolescence – i.e., the gap between L1, 2L1 and L2 speakers will diminish leading to a 'bilingual catch-up' – or whether some speakers are destined to experience incomplete acquisition due to the nature of their exposure to and experience with the language and its structures.

4.4.2 *Plural Morphology within the Language Curriculum*

According to the Welsh language curriculum (Curriculum for Wales, 2015 p.13), children are expected to show the following progression in terms of plural morphology:

- Year 3 children (age 7-8) should “spell plural forms correctly in context, e.g. *-au*, *-ion*”
- Year 4 children (age 8-9) should “spell more plural words correctly in context, e.g. *-iau*, *-i*”
- Year 5 children (age 9-10) should “spell more plural words, e.g. *-oedd*, *-od*, *-ydd*”
- Year 6 children (age 10-11) should “spell irregular plural words correctly, e.g. *car – ceir*, *plentyn – plant*” (Curriculum for Wales, 2015, p.13).

After Key Stage 2, there is no mention of plural morphology within the Welsh Curriculum, therefore, one could infer from this information that the system is expected to have been acquired by age 11. These guidelines seem also to assume progression according to perceived complexity of the various aspects of the system based largely on the frequency of occurrences rather than on the nature of the plural category type or based on what’s known about acquisition. It is also noteworthy that the focus of the curriculum is on spelling rather than ‘knowledge’. That is, whilst the implementation of the curriculum is up to each individual to administer, the curriculum, as worded, suggests that teachers are not required to teach plural morphology as a grammatical structure, only to ensure the correct spelling of each plural form. Therefore, it could be that many children are not explicitly taught the formally on the formation of the plural at any point during their education. This may be more of an issue for children for whom Welsh is their L2 and for whom exposure to Welsh is very much limited to the school domain. This is further complicated by the lack of distinction in the expected progress of those from different language backgrounds - that is whether or not those from English language backgrounds are expected to reach the same outcomes as those from Welsh

language backgrounds within the same time frame. Thus, given the continued differences in children's acquisition of these structures at age 11 (Thomas, et al., 2014), the present study aimed to provide clearer markers of attainment across speaker types in older children.

4.5 Study 2: Plural Morphology

4.5.1 Methodology

Participants

168 teenage participants took part in this study. Of the 168, 65 were aged between 12 and 13 years and 103 were aged between 16 and 17 (as shown in table 4.2). The participants in this study were the same participants that took part in Study 1: Grammatical Gender. Any participants who did not finish the test were excluded from analysis.

Table 4.2. Participant numbers by each age group and bilingual group

Age	L1 Welsh	2L1	L2 Welsh	Total
12-13	34	12	19	65
16-17	46	33	24	103
Adult	45	9	12	66

Linguistic Materials

The test presented to the children comprised of a list of singular words that they were required to pluralise (see appendix B for full test). These items were adapted from Thomas *et al.* (2014)'s study on plural morphology in Welsh, which comprised of the 8 different types of plural forms available in the Welsh language and were deemed appropriate for school-aged children, covering a range of different frequency counts as measured by the *Cronfa Electroneg o'r Gymraeg*, which is a corpus of one-million words of written Welsh (Ellis, O'Dochartaigh, Hicks, Morgan & Laporte, 2001). Smaller sets of nouns were selected from the pool of nouns used in Thomas et al. in order that the number of items in each category

was equal (24 items in all) and in order that the nouns chosen were those that were the lowest scoring items among the 11-year-olds in Thomas et al.'s study.

The 8 different plural forms in the study included 3 examples each of the following: the addition of plural affix (+suff; e.g. *cath* /ka:θ/ “cat” - *cathod* /ka:θɔd/ “cats”); the addition of a plural affix + an internal vowel change (+suff+V; e.g. *bwrdd* /bu:rð/ “table” - *byrddau* /bərðai/ “tables”); affix changes from singular to plural (~suff; e.g. *blodyn* /blɔ:dən/ “flower” - *blodau* /blɔ: dai/ “flowers”); affix changes from singular to plural + an internal vowel change (~suff+V; *blaid* /blaið/ - pl. *bleiddiaid* /bleiðiaid/ “wolves”); mass noun forms (-suff; e.g. *pluen* /pli:en/ “feather” - *plu* /pli:/ “feathers”); mas noun form + internal vowel change (-suff+V e.g. *aderyn* /adərin/ “bird” - *adar* /adar/ “birds”); internal vowel/diphthong change only (V; e.g. *dafad* /davad/ “sheep” - *defaid* /devaid/ “sheep”); irregular plural forms (Suppletive; e.g. *llaw* /lau/ “hand” - *dwyllo* /duilo/ “hands”). The 24 nouns were presented in their singular form on a single page with space for the answer to be written.

Procedure

Participants were given a list of singular nouns and asked “what is more than one of...” and asked to write down what they believed the plural form of that word was.

Scoring

For an answer to be deemed correct, the prescriptive ‘correct’ plural form had to be produced. For example, for the singular *cath* /ka:θ/ “cat” only *cathod* /ka:θɔd/ would be accepted (incorrect examples include: **cathau* /ka:θai/, **cathods* /ka:θɔds/). For each correct answer a score of 1 was given; for each incorrect answer, a score of 0 was given.

Consideration was given to dialectal differences in the forms produced e.g. *defed* /devəd/ instead of *defaid* /devaid/ “sheep”

Predictions

Based on previous findings in the field and participants' continued exposure to Welsh over time, the following predictions were made:

- If knowledge of the Welsh plural system increases with age, we would expect the 16- to 17-year-olds across all bilingual groups to outperform the 12- to 13-year-olds.
- L1 Welsh bilinguals would reach adult norms quicker than the other bilinguals.
- 2L1 bilinguals would reach comparable levels to the L1 Welsh group, converging at the latest at age 16-17.
- L2 Welsh bilinguals would show slower progression towards L1 Welsh levels, but they may not converge fully on all plural items.
- In terms of performance on different plural types, it was predicted that the performance on the more opaque forms – i.e. forms that include an internal vowel change – would be most susceptible to input frequency.
- Performance on suppletive and mass-count noun forms were predicted to be high, given their limited nature.
- For suffix types, it was predicted that the overgeneralization of *-(i)au* would be reduced with more exposure; however, it was also reasonable to assume that with increased competence in both English and Welsh, the overgeneralisation of *-s* was likely to remain steady across all bilingual groups.

4.6 Results

An 8 X 2 X 3 Repeated Measures ANOVA was conducted on the data involving Bilingual Group (L1 Welsh; 2L1; L2 Welsh) and Age (12-13, 16-17) as the IVs and Plural Type (i-viii) as the DV.

4.6.1 General Results: Bilingual Group and Age

Results of the ANOVA revealed a main effect of Bilingual Group [$F(2, 162)=29.381$, $p=.000$], which was due to the L1W bilinguals displaying higher knowledge in comparison to the 2L1 bilinguals [$p=.019$] and L2W bilinguals [$p=.000$], and the 2L1 bilinguals outperforming the L2W bilinguals [$p=.000$] (see figure 3.1 for mean percentages of responses). Results also revealed a main effect of Age [$F(1, 162)=4.714$, $p=.031$], which was due to the 16-17 age group displaying more advanced knowledge in comparison to the 12-13 age group, as predicted. There was also a significant interaction between the Bilingual Group and Age [$F(2, 162)=6.019$, $p=.003$].

A One Way ANOVA was conducted on the data to investigate the significance of Bilingual Group within each age group. For the 12-13 age group there was a weak significant effect of Bilingual Group [$F(2,62)=3.218$, $p=.047$]. Post hoc test revealed this to be down to the L1 Welsh bilinguals outperforming the L2 Welsh bilinguals [$p=.044$]. There was no significant difference between the L1 Welsh bilinguals and the 2L1 bilinguals [$p=.822$], nor the 2L1 and the L2 bilinguals [$p=1.00$]. For the 16-17 age group, there was a stronger main effect of Bilingual Group [$F(2, 100)=41.812$, $p=.000$]. Post hoc test revealed that this was down to the L1 Welsh outperforming both the 2L1 bilinguals [$p=.003$] and the L2 bilinguals [$p=.000$], and the 2L1 bilinguals outperforming the L2 [$p=.000$].

Another ANOVA was conducted on the data to explore the effect of Age within the Bilingual Group. The Adult data was included in this analysis to provide an estimation of ‘ultimate attainment’. Within the L1W analysis revealed there was a significant effect of Age

[$F(2, 122)=22.179, p=.000$]; however, results differed to the previous two bilingual groups with a significant effect of age seen between the 12- to 13-year-olds and the 16- to 17-year-olds [$p=.000$], but no significant difference between the 16- to 17-year-olds and the adult bilinguals [$p=.254$], which implies that at 16-17 years old, the L1W group are displaying adult-like performance on these items.

A significant effect of Age was also found for the L2W bilinguals, [$F(2, 52)=11.022, p=.000$], with the adult bilinguals outperforming the 16- to 17-year-olds [$p=.000$] and the 12- to 13-year-olds [$p=.003$]. There was no significant effect of age between the 12-13 and 16- to 17-year-olds [$p=.842$]. There was also a significant effect of Age for the 2L1 bilinguals, with the adult bilinguals outperforming the 16- to 17-year-olds [$p=.002$], and 12- to 13-year-olds [$p=.000$]. However, there was no significant difference of age between the 12-13 and 16-17 year olds [$p=.088$].

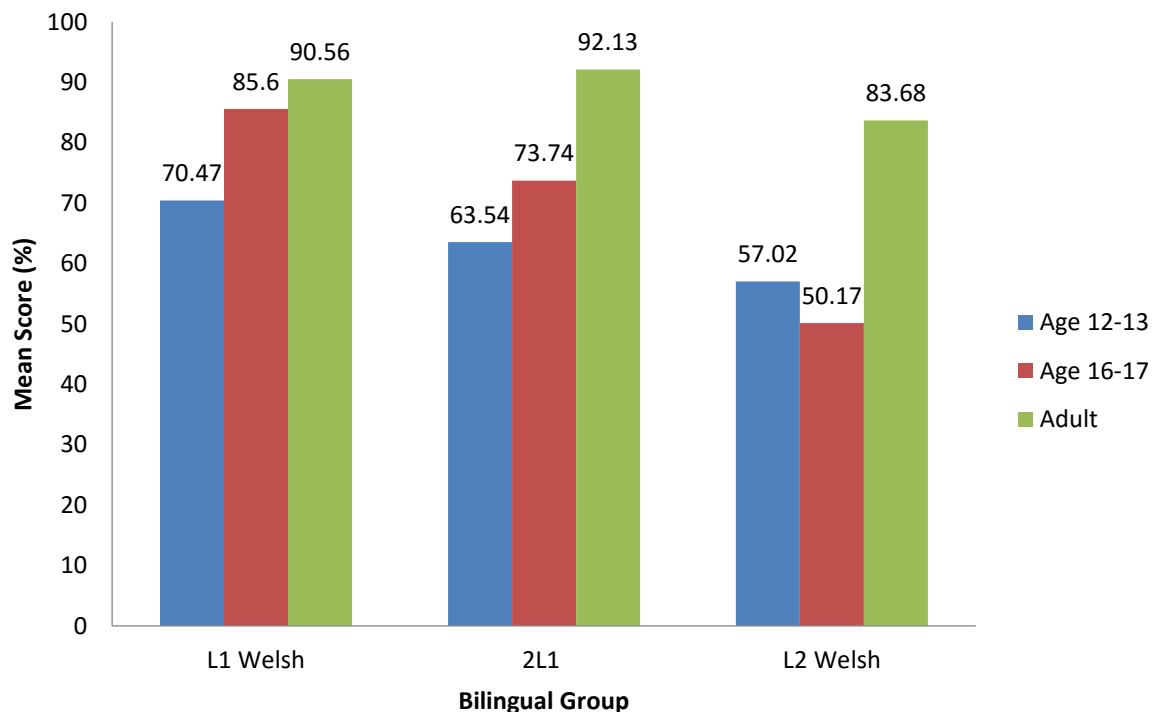


Figure 4.1: Mean per cent of plural scores across bilingual group.

4.6.2 Plural Type

The main analysis also revealed a main effect of Plural Type [$F(7, 1134)=107.215$, $p=.000$], which was due to the performance on certain plurals being significantly higher in comparison to others (mean percentage responses are shown in Table 4.3). Pairwise mean comparisons revealed that overall, most plural types were significantly different from each other [$p<.05$]. However, there were some insignificant performances among some of the items e.g. +suff vs. +suff+V, [$p=1.000$]; +suff vs. ~suff+V, [$p=.107$]; +suff+V vs. ~suff+V, [$p=.819$]; ~suff+V vs. V, [$p=1.000$]; -suff+V vs. Suppletive, [$p=1.000$] (see: Error Analysis for overview of error patterns).

Table 4.3: Average mean scores per cent across all Plural Types.

	Plural Type							
	+suff	+suff+V	~suff	~suff+V	-suff	-suff+V	V	Suppletive
L1 Welsh	68.33	65.5	59.7	73.02	89.62	93.5	78.39	96.69
2L1	50.76	49.63	38.51	64.27	82.45	92.3	73.11	98.11
L2 Welsh	33.37	44.67	23.26	42.29	72.18	84.65	44.34	84.14

Plural Type was further modified by Age [$F(7, 162)=2.689$, $p=.015$] and by Bilingual Group [$F(14, 162)=4.422$, $p=.000$]. The younger L1W bilinguals were displaying a projection towards adult norms on the -suff+V, and the suppletive plurals with performance over 85%, with the older L1W bilinguals at ceiling (97%+) on the -suff+V; -suff, and suppletive forms. While the 2L1 bilinguals were progressing at a slower rate (all $SE \leq 3.8$). Mean scores ranged from 54.9% [+suff+V & ~suff+V] to 94.12% [supp] for the younger L1W, while for the older L1W bilinguals, scores ranged from 64.49% [~suff] to 100% [-suff+V]. For the younger 2L1 bilinguals, scores ranged from 30.56% [~suff] to 97.22% [suppletive] that was higher than seen in the L1W bilinguals. In the older age group, scores ranged from 46.46% [~suff] to 98.99% [sup]. The L2W group on the other hand did not show progression towards adult norms, with scores ranging from 28.83% [~suff] to 87.72% [sup] for the younger group. The

older age group displayed a decline with scores ranging from 16.68% [~suff] to 83.33% [-suff+V] (a complete list of scores is provided in table 4.3).

In terms of performance, it is worth noting that the younger L1W bilinguals were performing consistently for all forms, particularly for suppletive items and those requiring suffix deletion and suffix deletion including and an internal vowel change. Performance was lowest for items requiring suffix addition with an internal vowel change and those requiring suffix alternation, and alternation with an internal vowel change. The other types were somewhere in between.

While for the older L1W bilinguals, lowest performance was seen on items that required an addition or alternation of a suffix, with the highest performance on the same items as seen in the younger L1W bilinguals. For the 2L1 bilinguals, performances of the 12-13 age group across plural types was mostly lower for all items in comparison to the L1W bilinguals (excluding suppletive items which performance was at 97.22%, higher than their corresponding L1W group), which suggests that 2L1 children have not ‘caught-up’ with L1 peers across most plural forms by this age. Their lowest performance was 41.67% [+suff+V] and 30.56% [~suff], however, performance across all plurals mostly followed the same performance pattern as the L1W bilinguals. The performance for both the younger and older L2W bilinguals was lowest on plural forms requiring a suffix alternation [29.83% and 16.68%] and interestingly, low on the +suff plural [26.39% and 40.35%]. Although it follows the overall pattern shown by the other language groups, the low performance is surprising given the transparency of the +suff plural form in relation to others which require a vowel change.

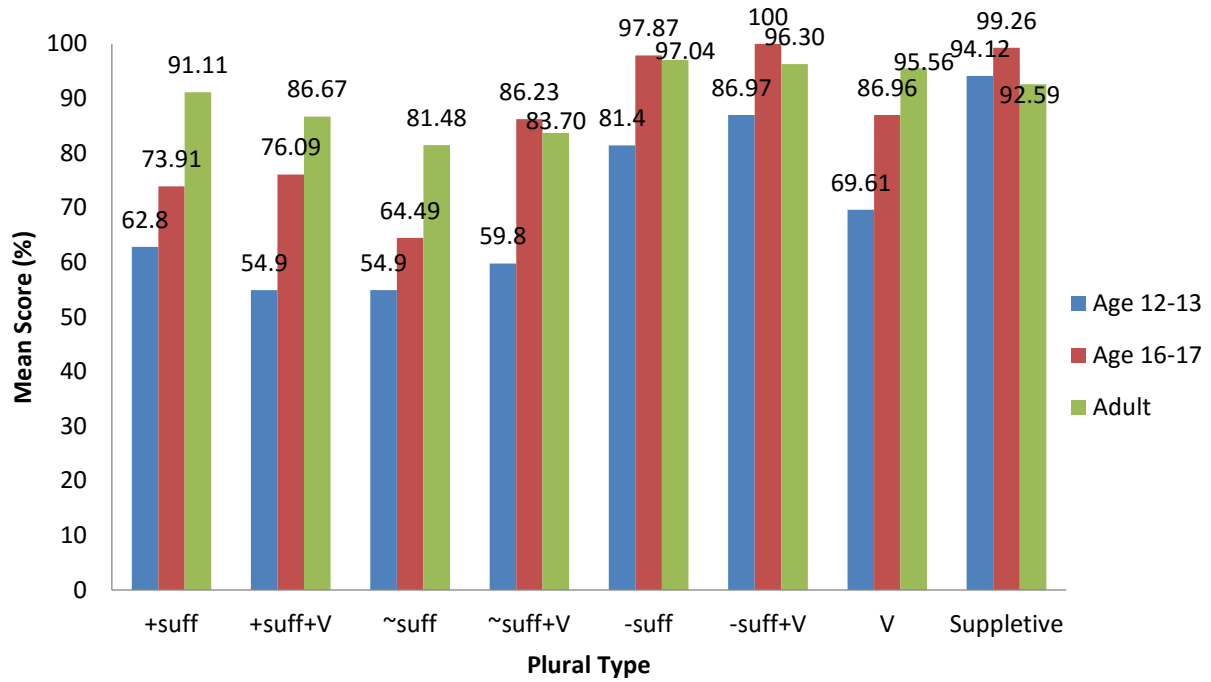


Figure 4.2: L1 Welsh teenagers vs. L1 Welsh adults' performance across all plural types.

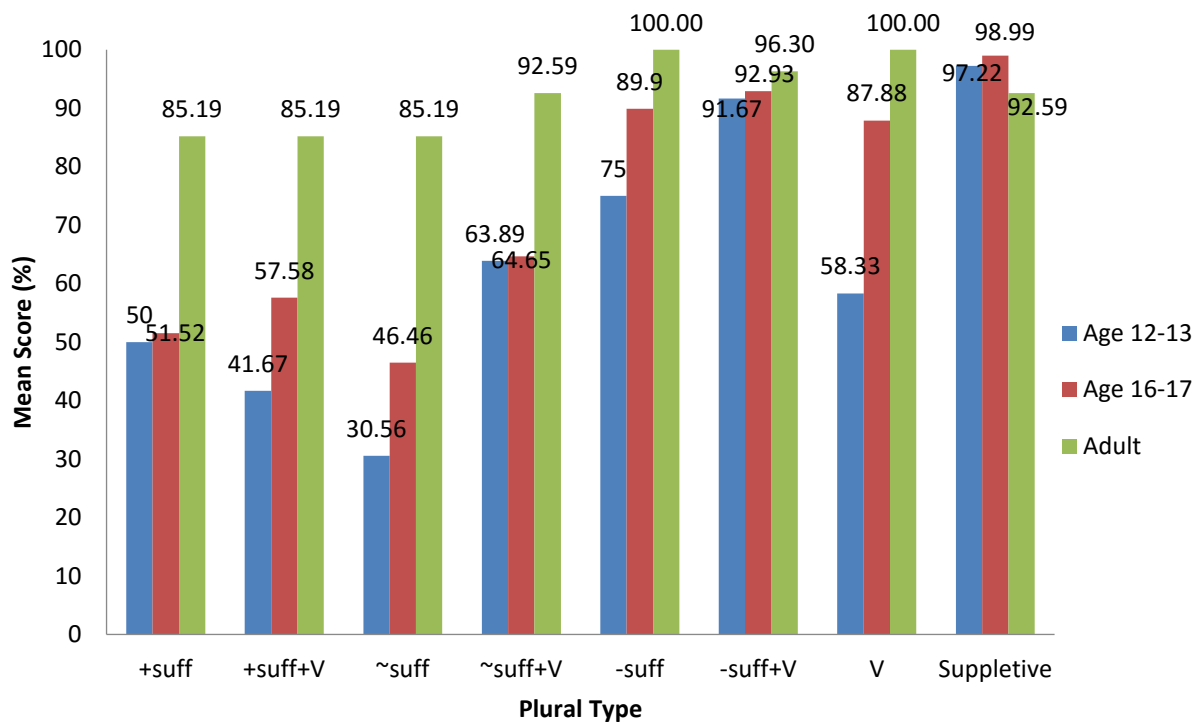


Figure 4.3: 2L1 Welsh teenagers vs. 2L1 Welsh adults' performance across all plural types

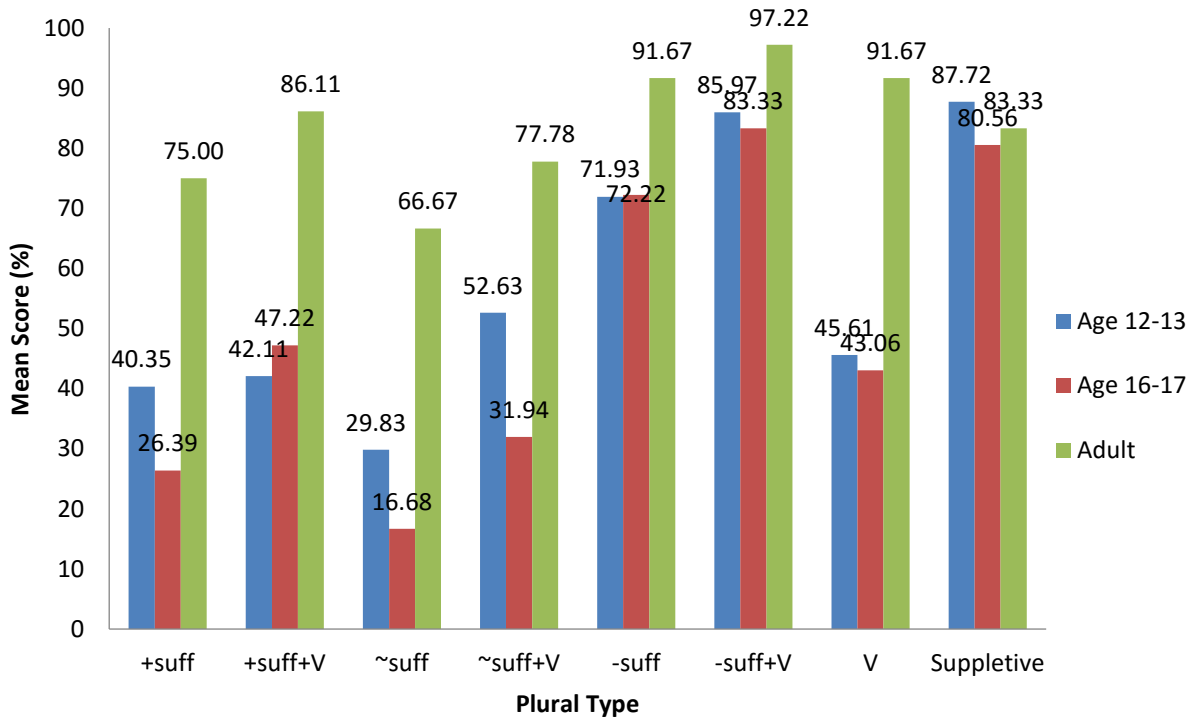


Figure 4.4: L2 Welsh teenagers vs. L2 Welsh adults' performance across all plural types.

4.6.3 Error Analysis

Given the age of the participants involved in this study, one could expect that for children from all three home language types should display some advance knowledge of the Welsh plural system, that is, the use of different plural types and suffixes. Within the teenage age bracket in general it is possible that with an increase in knowledge of both English and Welsh grammatical systems the overgeneralisation of the English suffix *-s* could be prominent in both the L1W and 2L1 bilinguals. However, this was not the case; with all language groups attempting to form a plural using plausible Welsh suffixes (see table 4.4). This section will discuss the variety of errors produced by participants from each bilingual group.

Zero plural marking

The production of forms that included no attempt to produce a plausible plural form was not high for either group, with these errors accounting for 2.99% of overall L1 Welsh

errors, 4.78% for 2L1, and 5.68% for the L2 Welsh bilinguals. This suggests that the majority of errors were produced by some form of overgeneralisation from within the system.

Table 4.4: Number of overgeneralisations per home language group.

Error Type	Bilingual Group		
	L1 Welsh	2L1	L2 Welsh
+ -(i)au	64.96%	65.14%	67.39%
+ -od	6.69%	8.57%	8.7%
+ -(i)aid	2.76%	2.29%	3.04%
+ -(i)on	1.97%	1.71%	4.35%
+ -oedd	10.63%	6.86%	8.7%
+ -i	6.69%	6.86%	4.78%
+ -wyr	0.39%	-	-
+ -edd	-	-	-
+ -ydd	1.97%	1.14%	0.43%

Overgeneralisation: The addition of a singular suffix.

By far the most common error seen in forming a plural across all participants was formation through the addition of a plural suffix to the singular stem [L1W: 65.57%; 2L1: 60.43%; L2W: 69.31%]. This was perhaps due to (i) the participants' knowledge that adding a plural suffix is the most common way of forming a plural; (ii) its relative transparency in comparison to types which include an internal vowel change; and (iii) its similarity to the English plural system (singular stem+[i]/[e]s). It is logical to presume, especially in the case of L2W bilinguals, this may be a factor in the overgeneralisation of this rule. Given the overall complexity of the Welsh plural system, a possible shift towards a simplified system could be underway; however, this sample is too limited for determining this and far more research would be needed in order to establish whether this was the case or not.

Vowel Alternations

Given plural forms requiring vowel alternations, with or without a suffix change are opaque forms [+suff+V; ~suff+V; -suff+V; V], it was likely that those would be the hardest to acquire. However, analysis showed that, while plurals that included a vowel change did

cause problems, they were on par with +suff and ~suff in terms of the lowest scoring items. While the explanation of +suff and ~suff could be linked to the overgeneralisation of *-(i)au*, the errors that were performed on items requiring a vowel change were either a failure to alternate the vowel. For example, *nant* /nant/ would be changed to **nantydd* /nantəð/ omitting the internal vowel change required (i.e, *nentydd*), or *blaid* /blaið/ would be either changed to **bleidd* /bleið/ omitting the plural suffix required (*bleiddiaid*), or participants would correctly alternate the vowel but include the incorrect suffix. However, +suff+V forms generated the second highest proportion of errors in each group, accounting for 12.61% of the overall errors.

Plurals which are formed through an internal vowel change only were not problematic for the L1W and 2L1 bilinguals, while the L2W group performed badly on these forms. This was most likely due to the tendency to add a plural suffix – or to over pluralise – for example instead of *geifr* /geivr/ which is the correct plural form of *gafr* ‘goat’, they would produce **geifrod* /geivrod/. Thus, these patterns suggest that the participants are aware that vowel change is a way of marking a plural, and that they are extracting this information from the input they receive. However, they have not yet acquired them fully. Notable also is the fact that the performance on items that included a deletion of the singular suffix and an internal vowel change were high across all three groups. This may possibly be due to the fact that only a small number of plurals form in that way, thus they are learnt item-by-item rather than as a rule.

Overgeneralisation: -(i)au

The most common overgeneralised suffix produced by all participants was of the *-(i)au* suffix, predominantly added onto a singular stem. This averaged at 64.96% L1W to 67.39% for L2W bilinguals, with the 2L1 bilinguals in between. While it’s worth noting that given the particular number of items in the test (24 in total) there may have not been many

situations for the prompting of other suffix. However, the number is particularly salient given the second most common error was *-oedd* for the L1W at 10.63%, *-od* for the 2L1 at 8.72% and both *-od* and *-oedd* for the L2W at 8.26%. Thus it is probable that at this age the participants are aware that *-(i)au* is the most common suffix form found in the input. This explains why it's likely for the suffix *-(i)au* to be the default strategy for unknown plurals, with 35% of L1W participants overgeneralising *-(i)au* over 80% of the time; 32.6% of the L2W and 37.8% of the 2L1 bilinguals.

It was expected that *-od* would account for a large proportion of the errors made, however the number of overgeneralisation of *-od* was less than 9% for all language groups. It was interesting that for the L1W bilinguals, *-od* was not the second largest error, thus again suggesting a greater level of understanding of the plural system in comparison to the 2L1 and L2W bilinguals. Other overgeneralisation errors include the *-i*; *-(i)aid*; *-oedd*; and, particularly by L2 Welsh bilinguals, *-(i)on*, with the prevalence of these errors ranging from 1.97% to 10.63%. Only 0.39% of L1 Welsh bilinguals produced errors including *-wyr*; however, while it could be due to limited knowledge of that suffix by the 2L1 and L2 Welsh bilinguals, it could be due to the association of *-wyr* with human nouns – which were not prevalent in the items chosen in the test. There were no errors involving *-edd* by any participants across the three language groups. While all suffix forms included in the error analysis are common to varying degrees in the input, these patterns suggest that all language groups are developing some level of knowledge of how to form a plural in Welsh. Although the large percentage of *-(i)au* errors does suggest, even with the knowledge of the different ways of forming a plural in Welsh, it is likely that *-(i)au* will remain the default suffix.

Overgeneralisation: English –s

While it was reasonable to assume that the L2 Welsh bilinguals would overgeneralise the English *-s* form, this did not seem to be the case, with *-s* only representing 2.48% of all

errors they produced. In fact, 2L1 bilinguals produced 5.23% of –s errors, while L1 Welsh produced 3.94%. The higher use of –s among the 2L1 children may be due to patterns of code-switching. However, it is not possible to address this question further with the present data.

Phonological and syntactic errors

While small in number, some 12 participants from across the different language groups produced some syntactic or phonological errors. There were errors in which three participants produced *deargrynfeydd* [dɛárgrəñvɛi:ð] “earthquakes” (sg. *deargryn* [dɛárgrəñ]) as the plural for *deigryn* [dei:grəñ] “tear”. While this error is not semantically linked to the word, the inclusion of the internal vowel change suggest that they are aware of sound change rules. Another possible phonological error included the production of **blewod* [blɛu:ɔd] “hairs” as the plural for *blaidd* “wolf” pl. *bleiddiaid* [blei:ðiar:d], while –od is a common plural suffix, especially with nouns for animals, while there was a sound change attempt, it was not plausible.

Other interesting semantic errors produced included the production of the verb *llefen* “to cry” for *deigryn*, while they fail to produce the plural, they do produce a semantically related verb. There were three instances of the similar noun *coedwig* “forest” produced instead of *coed* “trees”, which implies that the participants are making semantically connection between *coeden* “tree” and *coedwig*. For *plentyyn* “child”, there were two instances of the abstract noun *plentyndod* “childhood” being produced, which could be classes as both a semantic error or phonological, as they are both phonologically due to their use of the suffix –od and semantically plausible given its meaning. Other errors included *teils* “tiles” for *llechen/llechi* “slate(s)”; *afonydd* “rivers” for *nant/nentydd* “stream(s)”; *llyfrau* “book” for *llyfrgell/llyfrgelloedd* “library(ies)” which are all in one way semantically linked, while *sgwarnogod* “hares” for *llwynog/llwynogod* “fox(es)” is probably phonologically linked.

4.7 *Summary*

To conclude, this study suggests acquisition of plural morphology in Welsh, even during the teenage years, is still in the process of being acquired by both 2L1 and L2 Welsh bilinguals with lags remaining at 16-17. The results support previous research, maintaining that acquisition is contingent upon exposure. The opacity within the plural system continues to impact acquisition past age 11, suggesting that teenagers still struggle to reach that critical mass of exposure they need to acquire all forms fully. Error patterns across all bilingual groups were representative of the frequency the structures within the input, supporting constructivist-driven accounts of acquisition, as presented in Chapter 2. The performance pattern in this study follows the patterns that were seen in the gender study presented in Chapter 3, with a ‘catch-up’ evident among the younger age group but no such ‘catch-up’ among the older age group where the L2 Welsh bilinguals in particular seemed to plateau in their use of both structures. The implications of this study, from both an education and theoretical perspective will be discussed in Chapter 7.

Chapter 5: Teenagers' Welsh and English Receptive Vocabulary

Chapter 2 discussed the notion that input plays an important role in child language development, and Chapters 3 and 4 provided some new evidence of its role in relations to two relatively opaque grammatical structures. A number of studies presented in Chapter 2 have looked at the role of input in relation to vocabulary development, particularly in relation to children. This chapter presents data on teenagers' Welsh and English vocabulary knowledge, which includes testing method, statistical analysis of results, and a short discussion of the findings. Previous research from Gathercole and Thomas (2009), Thomas, Gathercole, and Hughes (2014), and Rhys and Thomas (2013), have found vocabulary deficits within Welsh-English bilingual children. All three found L2 Welsh and 2L1 children had smaller overall Welsh vocabularies in comparison to L1 Welsh children - a trend that Gathercole and Thomas (2009) found, using the *Prawf Geirfa Cymraeg* (Welsh Vocabulary Test) continued into adulthood. In addition, while the aforementioned studies reported gains with age, none has reported any convergence in vocabulary knowledge. In fact, Thomas, Gathercole, and Hughes (2013) discovered that a subset of L2 Welsh bilinguals displayed plateauing in vocabulary knowledge around age 15, with no gains seen around this age.

In the case of English vocabulary acquisition, Gathercole and Thomas (2009) discovered no lag in the acquisition of English vocabulary. They proposed that the dominance of the English language would result in L1 Welsh bilinguals acquiring English vocabulary at a similar rate to L1 English bilinguals. However, this result was not replicated by Rhys and Thomas (2013), who found L1 Welsh bilinguals lagging behind in their acquisition of English vocabulary. While both studies used a sample of children aged 11, it is possible that the differences reported were due to the varying degrees of English exposure participants within each study had received. However, it is possible in some areas of Wales where there is a high concentration of Welsh speakers, some L1 Welsh children may not receive enough

exposure to English to acquire comparable levels of vocabulary to L1 English bilinguals, a fact that is often overlooked by many due to the dominant status of the English language. However, irrespective of whether or not L1 Welsh children lag behind on measures of English vocabulary, the rate of its acquisition, particularly within teenagers, is less likely to be hampered in comparison to Welsh vocabulary. Therefore, as with the aims of the previous two chapters, the purpose of this study was to assess whether the Welsh vocabulary deficit reported previously for L2 Welsh and 2L1 children would disappear with continued Welsh-medium education.

5.1 Study 3: Methodology

Participants

142 participants took part in this study. Of the 142, 54 were aged between 12 and 13 years and 88 were aged between 16 and 17 (see table. 5.1). The participants who took part in this study were the same as those who took part in Study 1 and 2. Those who did not finish the test were excluded from analysis ($N=26$). There were no adult control group for this task, due to the lack of age-normed test for participants over 17 years old.

Table 5.1: Number of participants across each bilingual group

Age	L1 Welsh	2L1	L2 Welsh	Total
12-13	27	10	17	54
16-17	40	26	22	88

Linguistic stimuli

Participants were given a Verbal Analogy and Verbal Categorisation test, a sub-set of tasks adapted from the *Cognitive Abilities Test: Fourth Edition* (CAT-4) in English and the *Prawf Gallu Gwybyddol 4: Argraffiad Cymraeg* in Welsh (PGG-4) which assessed general verbal reasoning. Each test included 24 questions. For each question, five possible answers were presented, and all five choices shared some commonalities (see Examples 1 and 2 below). The participants' role was to identify the conceptual link between three words that

were presented, and decide which of the five word choices best fit with the three words provided. The reason for using this particular sub-set of tasks for the purpose of this study was to assess participants' ability to demonstrate knowledge of semantic links between words – i.e., to explore their depth of vocabulary knowledge rather than their breadth of that knowledge, as has been the case in many previous studies with children.

Example 1: Verbal Analogies

Feather	Cow -- Milk : Chicken -- Dinner	Egg	Hen	Bird
Pluen	Gwenynen -- Mêl : Iâr -- Cinio	Wy	Cyw	Aderyn

Example 2: Verbal Categorisation

Winter	Rain Snow	Fog Weather	Sunshine Dark	Night
Lliw	Gwyrdd Creon	Glas Paent	Coch Melyn	Enfys

Another reason for using the CAT-4 and the *PGG-4* was that they were the only vocabulary tests available in both English and Welsh for the age group tested. Participants aged 12-13 received versions E; participants aged 16-17 received versions G.

Procedure

Participants were first given an explanation of the task, and told to circle the word they believed fit into the sequence best. First, they were asked to complete the Verbal Analogies test. There were two practise questions to complete, and then they were given 8 minutes to go through the remaining 24 items on the *PGG-4*, before being asked to stop. They were given another 8 minutes to complete the CAT-4. The same procedure was replicated for the Verbal Categorisation test. Each word sequence was presented in a line, with the five possible answers underneath. All items were presented in a booklet.

Scoring

Each correct answer produced was given a score of 1; answers that were not correct were given a score of 0. The Verbal Analogies and Verbal Categorisation *PGG-4* and CAT-4 were scored separately and not combined. All raw scores were converted into percentages.

Predictions

The predicted outcomes of this study were as follows:

- There would be gains in vocabulary knowledge seen with age across all bilingual groups.
- Continuous input will lead to signs of ‘catch-up’ in the Welsh vocabulary knowledge of the participants, with convergence seen within the older participants.
- There would be no significant differences in the participants’ English vocabulary. This prediction is in line with the suggestion from the majority of research presented in Chapter 2 (e.g. Gathercole & Thomas, 2009), which suggest that L1 Welsh children would receive enough English input from their environment given its dominant language status for acquisition not to be hampered.

5.2 Results

5.2.1 Ages 12-13

A 2 X 2 X 3 Repeated Measures ANOVA was conducted on the data with Test Language (English, Welsh) and Test Type (Analogies, Categorisation) as the IV and Bilingual Group (L1 Welsh, 2L1, L2 Welsh) as the between subjects IV variable. In line with predictions, results of the analysis found no main effect of Bilingual Group, with each group performing at the same level [$p=.648$]. This result presents a strong indication of ‘catch-up’

in relation to performance in Welsh for this age group and suggests comparable performance across the two languages (see figure 5.1).

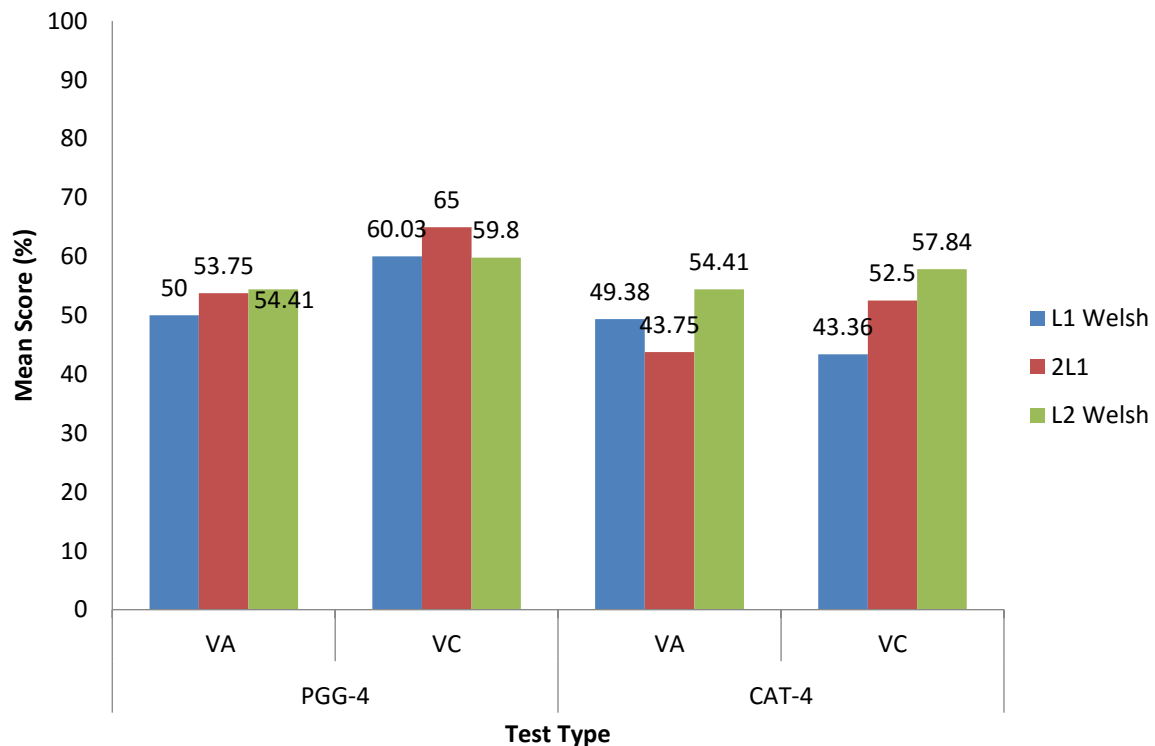


Figure 5.1: Performance of the 12-13 year olds on the CAT-4 and PGG-4 Verbal Analogies and Verbal Categorisation Test.

Effect of Test Type

The results revealed a main effect of Test Type [$F(1,51)=15.552, p=.000$]. This effect was down to the participants' overall performance being higher on the Verbal Analogies test [$M=56.28$] in comparison to the Verbal Categorisation test [$M=53.32$]. There was a significant interaction between Bilingual Group and Test Type [$F(2, 51)=4.907, p=.011$], this was due to the performance of L2W bilinguals being slightly higher on the Verbal Categorisation test [$M=57.46$] than the Verbal Analogies [$M=57.11$]. There was also a significant interaction between Test Type and Test Language [$F(1, 51)=30.844, p=.000$]

These results were followed up by paired sample t-test on the individual tests in each language. This was to investigate whether the significance found was the same across the

three bilingual groups. For the L2W bilinguals, the scores of the Welsh *PGG-4* on the Verbal Analogies test and the Verbal Categorisation test were not significant [$p=.123$]; this was also true for the English CAT-4 [$p=.262$]. For the 2L1 bilinguals, while there was no significance between test type for the Welsh *PGG-4* [$p=.092$] there was a weak significant difference between test type on the English CAT-4 [$t(9)=2.400, p=.04$], with performance slightly higher on the Verbal Categorisation test. For the L1W bilinguals, there was a significant difference of test type for the Welsh *PGG-4* [$t(26)=3.503, p=.002$], with higher performance seen on the Verbal Categorisation test in comparison to the Verbal Analogies, however there was no significant difference for the English CAT-4 [$p=.082$] (see figure 5.2).

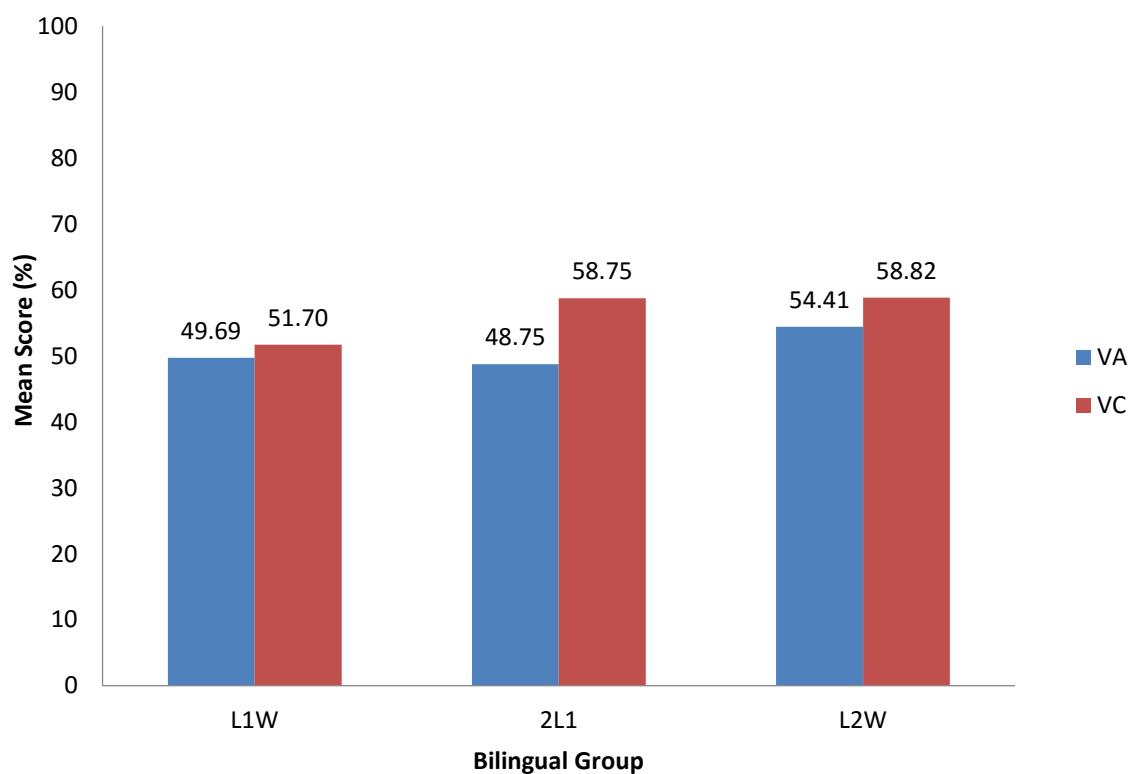


Figure 5.2: Performance of the 12-13 year olds on the Verbal Analogies (VA) and Verbal Categorisation (VC) tests.

Effect of Test Language

A main effect was found for Test Language [$F(1, 51)=9.908, p=.003$]. This was due to performance on Welsh being better than performance on English, however, the L2W were higher on the English in comparison to the Welsh (see figure 5.3). There was a significant interaction between Bilingual Group and Test Language [$F(2, 51)=4.907, p=.011$], however a follow up One Way ANOVA found this to be insignificant, with all groups performing comparably regardless of test language. In order to assess the location of the significance, a post hoc t-test was conducted to establish whether performance was significantly higher on the Welsh test in comparison to the English.

For the Verbal Analogies test, a paired samples t-test revealed there were no significant differences in the L1W [$p=.854$] and L2W [$p=1.00$] performance, with indistinguishable scores on the Welsh *PGG-4* and the English CAT-4. However, there was a significant difference shown by the 2L1 bilinguals [$t(9)=3.087, p=.013$], with performance on the *PPG-4* significantly higher to the performance on the CAT-4. For the Verbal Categorisation test results of the paired samples t-test revealed that there were no significant differences between the scores of the 2L1 bilinguals on the *PGG-4* and CAT-4 [$p=.056$] and of the L2 bilinguals [$p=.416$]. For the L1W bilinguals, the performance on the *PGG-4* was significantly higher than of the CAT-4 English [$t(26)=6.841, p=.000$]. When looking at the combined scores, the L1W and 2L1 bilinguals were significantly different [L1W: $t(26)=3.835, p=.001$; 2L1: $t(9)=3.346, p=.009$], whereas the L2W aren't [$p=.657$]. These results suggest that, while the L2W bilinguals are succeeding in achieving comparable levels of Welsh vocabulary to the L1W bilinguals, the L1W and 2L1 bilinguals are struggling to foster the same for English (see figure 5.3).

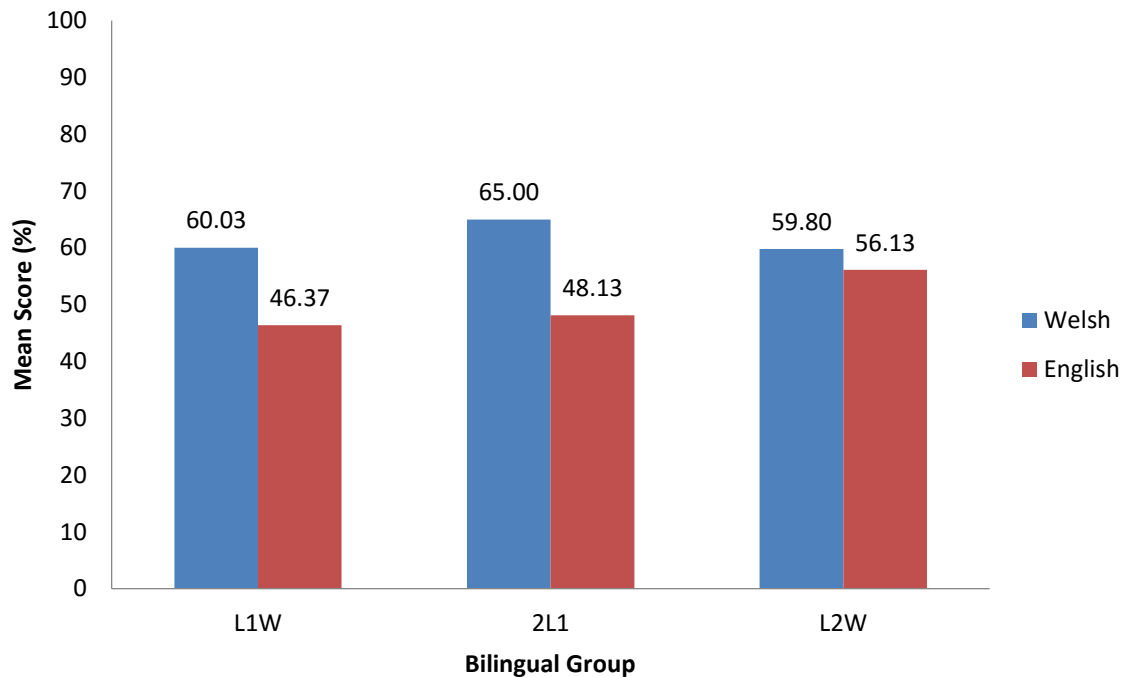


Figure 5.3: 12-13 year olds' Welsh and English vocabulary performance across Bilingual Group.

5.2.2 Ages 16-17

As with the younger age group, a 2 X 2 X 3 Repeated Measures ANOVA was conducted on the data comparing participants' Test Language (English, Welsh) and Test Type (Analogies, Categorisation) as the independent variables and Bilingual Group (L1 Welsh, 2L1, L2 Welsh) as between subjects independent variables. Results did not find a main effect of Bilingual Group [$p=.597$], with all language groups performing at a similar level. As with the 12- to 13-year-olds this result suggests that 'catch-up' has occurred (see figure 5.4). A follow-up One Way ANOVA revealed a significant effect of Bilingual Group for Welsh vocabulary [$F(2, 85)=5.406, p=.006$], with the L1W outperforming the L2W [$p=.005$]. There were no significant differences between the L1W and 2L1 [$p=.162$] and the 2L1 and L2W [$p=.376$]. There was no main effect of Bilingual Group for English [$p=.363$].

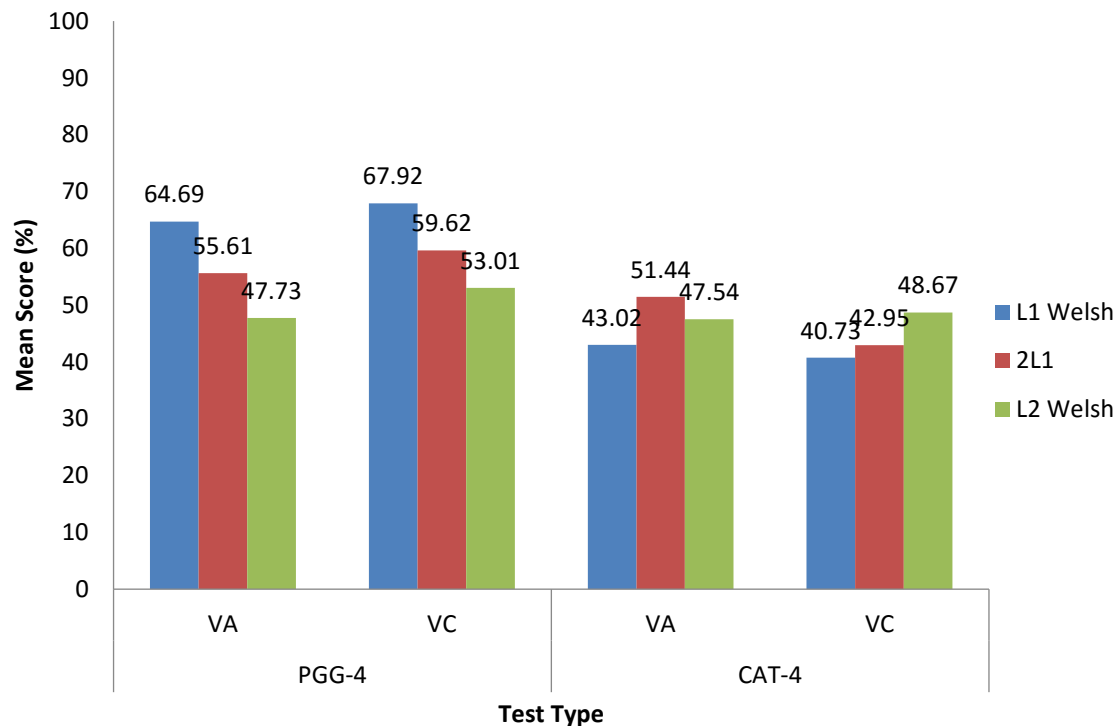


Figure 5.4: Performance of the 16-17 year olds on the CAT-4 and PGG-4 Verbal Analogies and Verbal Categorisation Test.

Effect of Test Type

There was a main effect of Test Type, [$F(1, 85)=207.507, p=.000$] which pairwise comparison found was due to the performance on the Verbal Analogies [$M=51.89$] test being significantly different [$p=.000$] in comparison to the Verbal Categorisation [$M=51.11$] (see: figure 5.5). There was also an interaction between the Test Type and Bilingual Group [$F(2, 85)=4.851, p=.010$] due to the performance of the L1W and L2W being higher on the Verbal Categorisation Test, [L1W: $M=54.33$; L2W: $M=50.85$] and the 2L1 bilinguals performing higher on the Verbal Analogies [$M=53.37$]. A further paired samples t-test was conducted to investigate this interaction further. When separately comparing the performance on each test type within each language a paired samples t-test found that the only significant difference

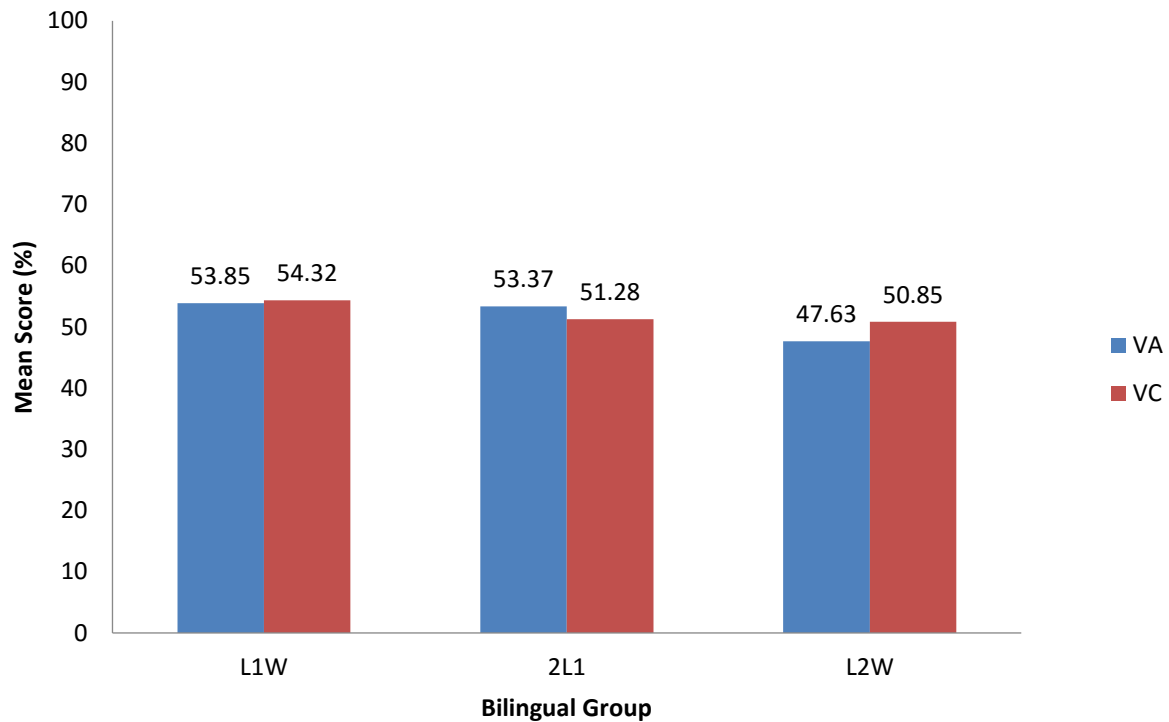


Figure 5.5: Performance of the 16-17 year olds on the Verbal Analogies (VA) and Verbal Categorisation (VC) tests.

Effect of Test Language

There was a main effect of Test Language [$F(1, 85)=22.438, p=.000$]. Pairwise comparison found that this was due to the performance on the Welsh *PGG-4* [$M=54.04$] being significantly higher [$p=.000$] as compared with the performance on the English *CAT-4* [$M=48.96$] (see: Figure 5.6). There was also a significant interaction between Bilingual Group and Test Language [$F(2, 85)=11.188, p=.000$]. This was due to the performance of L2W bilinguals being higher on the English *CAT-4* [$M=49.53$] in comparison to that of the L1W and 2L1 bilinguals, whose performance was highest on the Welsh *PGG-4* [L1W: $M=59.09$; 2L1: $M=54.69$].

A further paired samples t-test was conducted on the data to investigate this interaction further, and to establish whether participants' performance on the different language tests were significantly different. Results revealed for the L2 Welsh bilingual group the performance on the Welsh *PGG-4* Verbal Categorisation test and the English *CAT-4* Verbal Categorisation test were not significantly different [$p=.314$], the same was found for

both Welsh and English Verbal Analogies tests [$p=.963$]. However, the L1 Welsh bilinguals' performance was significantly different on the Welsh *PGG-4* and English CAT-4 Verbal Categorisation test [$t(39)=11.788, p=.000$], and on the Verbal Analogies test [$t(39)=7.828, p=.000$] with on both performance significantly higher on the Welsh *PGG-4* in comparison to the English CAT-4. For the 2L1 bilinguals, performance on the Welsh *PGG-4* Verbal Categorisation was significantly higher in comparison to the English CAT-4 [$t(25)=4.976, p=.000$], however, there was no significant difference between the performance on the Welsh *PGG-4* Verbal Analogies and the English CAT-4 [$p=.124$]. However, when combining the two tests, the results were significant [$t(25)=3.498, p=.002$].

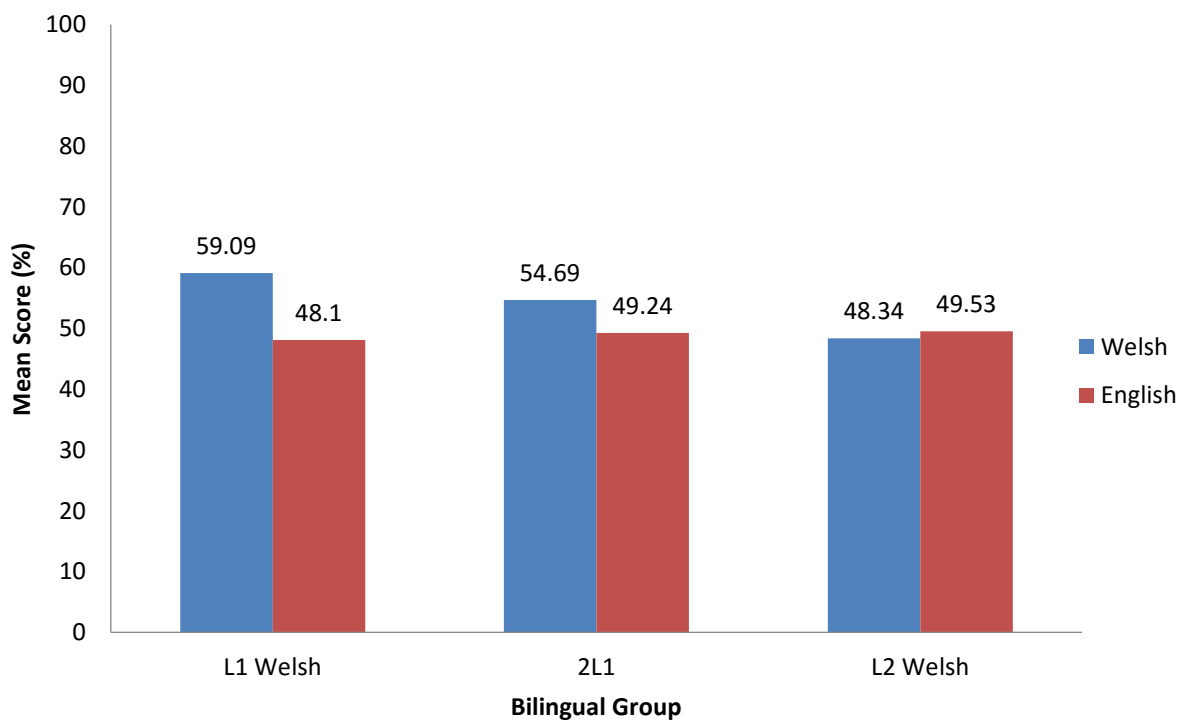


Figure 5.6: 16-17 year olds' Welsh and English vocabulary performance across Bilingual Group.

Test Type X Test Language X Bilingual Group

Results also revealed a three way interaction between Test Type, Test Language, and Bilingual Group [$F(2, 85)=9.247, p=.000$]. A further One Way ANOVA was conducted on

the data to establish where the interaction lay. Results revealed an effect of Bilingual Group on the *PGG-4* Verbal Analogies [$F(2, 85)=4.365, p=.006$]. Post hoc test revealed that the significance was down to the Welsh L1 bilinguals outperforming the L2 Welsh bilinguals [$p=.014$], however, there was no significant difference between the performances of the L1 Welsh bilinguals against the 2L1 bilinguals [$p=.329$], and no significant difference between the 2L1 against the L2 Welsh [$p=.644$]. There was also a main effect of Bilingual Group on the *PGG-4* Verbal Categorisation test [$F(2, 85)=5.693, p=.005$]. Post hoc tests revealed that this was down to the L1 Welsh bilinguals significantly outperforming the L2 Welsh bilinguals [$p=.004$]. There were no significant differences between the 2L1 bilinguals and the L1 Welsh bilinguals [$p=.170$] and the L2 Welsh bilinguals [$p=.558$], suggestive of catch-up between the 2L1 bilinguals and the L1 Welsh bilinguals on this test in Welsh. For the CAT-4 Verbal Analogies test, there was no main effect of Bilingual Group [$p=.349$]. There was no main effect of Bilingual Group for the CAT-4 Verbal Categorisation test [$p=.262$]. However, performance of the L2 Welsh bilinguals was higher in comparison to the 2L1 and the L1 Welsh bilinguals (see figure 5.4).

5.3 *Summary*

To summarise the results, there was a general ‘catch-up’ found across language groups on these measures. Among the younger bilinguals on the Welsh vocabulary test, both the 2L1 and L2 Welsh bilinguals converged with the ability of the L1 Welsh bilinguals, as seen also for Grammatical Gender in Chapter 3. However, as with Grammatical Gender, this effect was lost within the older bilinguals. While initial analysis revealed no main effects of Bilingual Group among the older cohort, further analysis revealed that the L2 Welsh bilinguals were not performing at comparable levels to L1 Welsh bilinguals, with only the 2L1 bilinguals continuing to perform at comparable levels to their L1 Welsh peers. Chapter 7 will go on to discuss the possible reasons for, and any possible implications of this result. The

next chapter in this thesis will discuss the role socio-linguistic factors influence participants overall attainment of vocabulary, plural morphology, and grammatical gender.

Chapter 6: Young Adults' Attitudes and Language Use

The results of Chapters 3-5 present a complex picture with regard to the notion of whether the well-established bilingual lag during childhood can disappear with time and during the adolescent years with increased exposure to and experience with the language. Given the mixed patterns in the context of Welsh plural morphology and vocabulary, it is worth considering the role of other factors beyond input factors in shaping children's acquisition of a minority language. In a recent review of the field, Carroll (2017) voices scepticism with the majority of bilingual acquisition research (e.g. Paradis & Genesee 1996; Gathercole & Thomas, 2009), which she claims are promoting a casual relationship between language exposure and language outcomes. While there is disagreement with certain parts of Carroll's paper (e.g. Paradis, 2017; Grüter, 2017) she highlights an important issue that needs to be addressed. Carroll (2017, p.4) states that

“Learners’ belief systems and identity are not normally part of the analyses of grammarians but they are part of the story of differential outcomes to bilingual learning”

Therefore, any continuing lags in performance within bilingual populations may well be due to the sociolinguistic factors that operate on an individual level, factors which are rarely combined in studies addressing ultimate attainment of language. Some of the known barriers to successful L2 acquisition in particular have to do with the individual's linguistic self-esteem, their own attitude towards the language they are acquiring, and/or their attitudes towards bilingualism itself, and the effects that their attitudes can have on their motivation to learn (Carroll, 2017). Since some of the participants in the present study were L2 speakers of Welsh, and 2L1 bilinguals whose dominant language may be English, the potential effects of these types of variables should be addressed. This chapter outlines what is known in the

literature about the relationship between attitudes, motivation, and language learning, focusing primarily on the bilingual/L2 context, concluding with analyses of questionnaire data in relation to the vocabulary and grammar data to establish any potential relationship between them.

6.1 Attitudes towards language

As early as Fishman (1964), researchers have proposed a link between an individual's attitude to language and that language's vitality. Attitude to language has been defined by David Crystal (1992, p.215) as "*the feelings people have about their own language or the language(s) of others*", for example when faced with different varieties of language or language groups (Baker, 1992). Whilst attitude towards language is not the main focus of this thesis, the influence of attitude on teenagers' overall Welsh attainment levels is explored through this chapter.

When discussing the link between language attitude to language learning, Baker and Prys-Jones (1998) proposed different attitudes to language learning across two types of learners: integrative learners and instrumental learners. Firstly, Baker and Prys-Jones (1998) state that integrative learners are those who wish to identify with another language group or wish to join another language group. They infer that such learners take an interest in the people, community, and culture that comes with that language, thus fostering a positive attitude towards the language and its speakers. Yet, if the learning environment is less positive (e.g., when a teacher may discipline a child for speaking a given language in the classroom) then even integrative learners may eventually reject the language, a factor commonly cited (anecdotally) as a reason for students fostering a dislike of the Welsh language.

Secondly, Baker and Prys-Jones (1998) suggest that instrumental learners are those who learn language for useful purposes, such as learning the language for utilitarian reasons,

for example to support their child who is receiving bilingual, or Welsh-medium education, or as a work requirement (Baker & Prys-Jones, 1998; Gardner & Lambert, 1978). Instrumental reasons such as these may feature behind the decision of non-Welsh speaking parents to send their children to Welsh-medium schools if they are unable to transmit the language to their children themselves.

Baker and Prys-Jones go on to state that integrative motivation is more likely to lead to greater proficiency than instrumental motivation. This view is based on earlier suggestions proposed by Gardner and Lambert (1972) that integrative motivation tends to concern personal relationships and thus may be more sustained given the endurance of personal relationships in comparison to instrumental motives, which can be more short-term and likely to be abandoned when that goal is met. However, Baker and Prys-Jones (1998) suggest that most language learners possess aspects of both types of attitudes, depending on their experiences and reasons for learning the language.

Nevertheless, attitudes are susceptible to change and develop for many reasons. Attitudes can both develop and change due to the potential rewards bestowed on an individual for or for not speaking a language, or due to the pervasiveness of the language within the community (Baker & Prys-Jones, 1998). However, a positive attitude to a minority language can reduce with age, often when the individual leaves education (where use of the language was supported and/or rewarded). If a child understands and can see the benefit of using a language outside of the classroom, they are more likely to do so. If this is the case, external activities need to encourage and reward the use of all languages if those languages are to be embraced and survive. In a context like Wales, Welsh competes with English in many ways, not least in terms of opportunities for its use and encouragement it do so. Continuing to use Welsh outside school is more likely to reinforce children's use of Welsh in the future and improve their self-confidence when using that language (Baker & Prys-Jones,

1998). However, when the opportunities and/or rewards for using the language are diminished in society, speakers may not feel the same motivation to continue speaking a language like Welsh, thus their attitude may shift to a less positive one as a consequence (Baker, 1992).

Attitude can also be changed through the influence of others. In particular, language use and attitude towards language by a given individual can influence the usage patterns and attitude of other individuals. This is particularly salient if the individual ‘model’ holds a certain social status. For example, individuals in the sport, entertainment, and media industries can promote positive attitude towards a minority language through using the language themselves (Baker & Prys-Jones, 2008). However, Baker and Prys-Jones (2008) highlight that notable individuals who promote and use Welsh are often less recognisable in comparison to those who do not speak or use Welsh. These ‘high social status’ individuals are therefore unlikely ambassadors when encouraging teenagers to speak Welsh (Iaith Fyw, Iaith Byw, 2012). It is also worth noting that the influence of high social status individuals could also have the opposite effect: notable individuals who publicly dismiss Welsh could equally influence speakers’ attitudes to become more negative.

Lastly, the community can play a large role in shaping the attitudes that the individual holds towards a minority language. As minority languages are in constant competition with the dominant community language, perceived relationships between the languages and the perceived status attached to each language in that community can play a major role in attitude change. If a speaker lives in a community in Wales that has a high concentration of Welsh speakers, this in turn could promote a positive attitude through exposure to the language, and to those who use the language (Baker, 1992).

In minority language contexts, attitude to bilingualism and bilingual education is considered a ‘hot topic’ among educators, politicians, and researchers alike. Gardner (1983,

1985a) places attitude alongside intelligence, aptitude and anxiety as a factor in bilingual proficiency. Situations that lend themselves well to variations in attitudes are those where a majority-spoken, societal language exists alongside a more marginalised minority language. Under such circumstances, the existence of a minority language is often under threat, and speaker attitudes can become heightened in a positive and/or a negative way. The Welsh-speaking context in Wales is a case in point.

6.2 Welsh Language Education and Language Survival

While there are gains to be seen in children's proficiency in Welsh through the Welsh-medium education they receive (Thomas & Gathercole, 2007; Gathercole, Thomas & Hughes, 2008, This thesis), what needs to be addressed is why Welsh does not become a natural language for conversation for both L1 Welsh and L2 Welsh speakers during education and adult life. A vast amount of Welsh-speaking children come from English dominant areas of Wales and grow up in English language households (Jones, 2008; 2012). These children have acquired Welsh mostly through the school system rather than through parental transmission in the home (Jones, 2008). It is widely accepted that successful transmission of a minority language relies heavily on the family and its patterns of what Fishman (1991, p.6) terms as 'intergenerational language transmission'. Speaking a minority language in the home has long been acknowledged as an important factor in language reproduction (Hodges, 2012). Consequently, language transmission in the family could be viewed as the most natural planning mechanism for the transmission of a minority language (Morris & Jones, 2008; Hodges, 2012). The absence of transmission in the family, or as Fishman (1996, p.187) states the "*lack of sufficient inter-generational mother-tongue transmission*", is a detrimental factor in the maintenance of language, with minority language survival being over reliant on education and community support in its place (Fishman, 1991; Hickey, 2007; Morris & Jones, 2008).

Whilst Welsh-medium and bilingual education has been suggested by some to be a success story in terms of ensuring the survival of the language (Deuchar & Davies, 2009), and is seen as a “*basic instrument for the revival and preservation of the Welsh language*” (Khleif, 1980, p.66), for many speakers, Welsh is ‘the language of education’ used mainly at school and not as a social tool (Thomas, Apolloni & Lewis, 2014). However, Fishman (1991) warned against the ‘over-reliance’ on education as a vehicle to slow down language shift. He states that education should be a contributor rather than a substitute to what he terms the ‘home-family-neighbourhood-community-processes’. Nevertheless, Welsh language education is an important factor in language transmission and necessary for the creation of potential new speakers of Welsh. However, whether it fosters healthy attitudes towards Welsh is debatable. Rendering Welsh to a specific domain (in this case education) may not necessarily produce healthy attitudes towards the language, a factor that has the power to influence whether or not bilinguals continue to embrace and use their L2 in order to obtain the critical mass of exposure that is necessary in order to ‘catch-up’ with L1 speaker norms, as detailed previously in Chapter 2 (and as will be discussed in more detail further in the chapter).

While receiving education through the medium of a minority language does lead to At least some language ability, it does not necessarily provide young speakers with the productive social skills that they need for conversing in that language outside school (Ó Giollagáin et, al. 2007; Genesee, 1978). However, research on the linguistic interchange in schools have long suggested that children who learn English as an L2 through immersion schooling should be able to reach communicative competence within as little as two years. Academic competency on the other hand can take up to nine years (Cummins, 1981a; Collier, 1987; 1989). Therefore, children from English homes should, in theory, be able to

communicate in Welsh after a fairly short time. However, learning a language to an academic level on the other hand, will take more time and effort (Thomas & Roberts, 2011).

While it is possible for children who attend Welsh medium education to become fluent in Welsh during Welsh-medium education, this is not always the case, and many studies have noted how L2 pupils use Welsh infrequently outside of the school domain (Jenkins, 2001; Jones & Martin-Jones, 2004; Thomas & Roberts, 2011). It is logical to assume here that L2 children who do not use Welsh outside of school do not do so either due to a lack of opportunity, a lack of competence, lack of confidence, and/or less favourable attitudes towards its use. Other reasons may draw on general attitude to learning. For example, it is often implied that in general, the anti-schoolwork mind-set that some less successful students possess, especially male students, does not work well with the need for hard work required to learn a language (Bartram, 2006).

Thus it is possible that receiving Welsh-medium or bilingual education will not necessarily lead to informal (or formal) use of the language outside of the school (Genesee, 1978; Vila i Moreno, 1996; Cenoz, 2008; Oller & Eilers, 2002). Others have noted that this may also be the case inside the classroom (Ramírez, et al. 1991; Thomas & Roberts, 2011; Thomas, Lewis & Apolloni, 2012). The extent to which this may influence pupils' ability to acquire and access aspects of educational knowledge is a contentious issue that should not be ignored and that is not currently well understood. Further research is needed in order to explore the relationship between language skills and access to educational knowledge more fully.

Markers of Esteem

Negative attitudes to minority language are often linked to the status of that language, and whether a minority language is used in the greater community is often determined by the prestige of that language. Oliver and Purdie (1998) suggested this was the case among

immigrant children in Australia who perceived their parents as preferring them to use the more prestigious L2, English, in the classroom, and their L1 in the home. If the minority language does not share the same prestige as the dominant community language, then it is unlikely that the minority language will be used (Cummins, 1987). The power relations between L1 & L2 speakers or minority vs. majority speakers can directly influence children's attitudes towards the minority language, especially within the school context (Cummins, 1987).

Under minority language conditions, it is plausible that markers of 'esteem' (e.g., value, importance) could affect students' willingness and motivation to learn Welsh. One could argue that individuals who do not speak Welsh (although able to) may not place much value or importance onto the language as they would the majority language – English. This possibility is supported by Macnamara's (1973) theory that L2 learning is triggered by a need to be understood and to understand, thus success in learning a new language is reliant on need rather than attitude.

Therefore, formal or informal education does not guarantee full take up of that language, as it may not lead to what McIntyre et al. (1998, p.546) refers as the 'willingness to communicate' in different contexts. The willingness to communicate in the minority language may not be based on language capability as such. Rather, it may be largely dependent of socio-psychological factors, such as attitudes towards the target language in the home, among peers, and in the wider community (de Howuer, 2016; Carroll, 2017), as well as the media, personal experiences, and others' influence (Baker & Prys-Jones, 1998; Thomas, Apolloni, & Lewis, 2014). When these types of sources display a negative attitude towards the minority language, then the child may pick up those attitudes (Macaulay, 1975). Together, these factors can play a role in the ultimate success of that language as a living language (Baker,

2002; 2006). This chapter will now go on to present some of the known sociolinguistic factors that may influence teenagers' overall stance towards the Welsh language.

6.3 *Parental Attitudes to Welsh and Welsh-Medium Education*

It is to be expected that home language experiences may influence the preferred language of a speaker, and subsequently the language they eventually choose to transmit to their own children (Gathercole & Thomas, 2007). Previous research on language transmission found that households with one Welsh speaking parent were most at risk of abandoning the language (Lyon & Ellis, 1991; Aldridge & Waddon, 1995), a factor that could influence the linguistic outcomes of the child in the Welsh language. For many non-Welsh speaking families, education is the main option to facilitate Welsh language learning among their children with the hope that they in turn will be in a position to transmit Welsh to their children (Hodges, 2012). Indeed, a recent survey found that of a sample of 7,175 Welsh-speaking informants, approximately 43% of Welsh speakers learnt to speak Welsh at home, the remainder learnt through education (Welsh Language Use in Wales, 2015).

The influence of the family on the linguistic habits and practices of children cannot be overstressed, especially when these habits and practices are formed early in childhood (Hodges, 2012; DeHouwer, 1990; Genesee, Nicoladis, & Paradis, 1995). Bonnesen (2009) found bilingual children would often switch to the stronger or dominant language, or in some cases, refuse to speak the minority language at all with their parents. As a result, parents may use this change as a sign (or sometimes as an excuse) to cease speaking the minority language with their children altogether. A survey by Gathercole, Thomas, Deuchar & Williams (2007) found that there were three factors that influenced parents' choice of language with their child: (i) The parents' home language as a child, their own language capabilities and their experience with Welsh; (ii) The language of the parent's partner (in the case of children brought up in a households where one parent spoke English, the other Welsh) which

influenced the language spoken to the child; and (iii) If the parents had a language support system, such as family and friends who spoke Welsh (see also Jones, 2008). Gathercole, et al. (2007) also found there were several less influential factors that also modified the parent's natural language choice under certain circumstances:

- i) The potential, either real or perceived, for the child to experience language difficulties (Ware, Lye, Kyffin, 2015)
- ii) Holding extreme positive or negative attitude towards Welsh.

While holding extreme attitudes was a minor factor, it did influence the choice of language used with the child in some families. However, when transmission of the language in the home is not an option, parents' attitude towards Welsh can influence their choice of education medium for the child.

Hodges (2012) found that 50% of parents in the Rhymni Valley stated that cultural factors was a main factor in parents' decision to send their children to a Welsh-medium school. 34% chose educational reasons and only 8% chose economic and personal reasons as a main factor. Hodges' results suggest that parents, overall, choose to send their children to Welsh-medium school for integrative reasons rather than instrumental reasons, supporting previous work by Lyon (1996) and Thomas (2007), whilst contradicting older research by Williams, Roberts, and Issac (1978), who claimed it was generally for economic reasons.

While parents' perception of minority language has been linked to the attitude that their child has towards the language (Chumak-Horbatsch, 2008; Lyon, 1996; Morris & Jones, 2007) with the attitudes of children often mirroring those of their parents (Oliver & Purdie, 1998), parental attitude to Welsh and Welsh-medium education does not always match that of their child. Some parents possess a more positive view of Welsh-medium education in comparison to that of their children. This might be due, in some cases, to parents holding integrative attitudes because they see themselves as part of a 'lost generation' who were not

given the opportunity to receive the language themselves (Hodges, 2012). This view goes on to dictate their choice of bilingual education for their children; as a result, they want their children to be included in the culture that they feel they were denied (Hodges, 2012). Other parents may hold instrumental attitudes where they see the economic benefit that the ability to speak Welsh has for future employment in Wales (Baker & Prys-Jones, 1998; Williams, Roberts, and Issac, 1978; Hodges, 2012). Their children, however, do not always mirror such positive beliefs about Welsh leading to greater job prospects in Wales.

Overall, the attitude of the parents included in Hodges' (2012) paper towards bilingual education was positive, with parents stating that they wished for their children to have the opportunity to learn Welsh. H. Thomas (2007) found that the most popular reason for parents to send their children to Welsh-medium schools was bilingualism itself, with parents also showing strong feelings in favour of the Welsh language. The positive attitude could be seen to extend outside of the sample in Hodges (2012), with the oversubscription of pupils to Welsh-medium schools in some Anglicised areas evident (Jones, 2008; H. Thomas, 2007).

However, most of the research mentioned does not focus on the transmission between primary education and secondary education. Although there does not seem to be any academic journal articles looking explicitly at this in the Welsh context, parents might choose Welsh medium education at primary level, but opt for English-medium at secondary. Parents, especially those who do not speak Welsh, might consider English medium education more beneficial for higher education, and/or employment in a global world. There are also some individuals who deny a benefit to Welsh-medium schooling such as Gorard (1998, p.460) who stated, "*There is no evidence that Welsh-medium education per se, leads to any advantage in schooling*". While this view has been rejected for being limited in support (Thomas, 2013), there is also evidence against this – i.e., years of data on the better GCSE

outcomes in bilingual and Welsh-medium secondary schools in Wales. However, there is still a popular belief that children who receive a bilingual or Welsh-medium education will underperform on standardised tests in comparison to monolinguals, not because of the nature of bilingualism per se, as discussed in Chapter 2, but because of a belief in the monolingual ideal and that children become confused when faced with two languages.

However, one limitation of Hodges' (2012) and Thomas' (2013) research is that they focused on parents who already send their children to Welsh-medium schools, which suggests that they would already possess a positive, or at least neutral, attitude towards Welsh-medium or bilingual education. Whilst the views of these parents are of vital importance to understand the reasons and appetite for Welsh-medium and bilingual education, their views are not representative of all parents in Wales. The attitudes of parents who do not send their children to Welsh-medium education could be drastically different, or even those who have no choice when a county offers only Welsh-medium/bilingual Government-maintained schools, and perhaps far more negative (e.g. Gogwatch, 2002). Such an attitude could well be transferred to their children, especially those who learn it as a compulsory L2 in English-medium schools in Wales. However, parents are not the only individuals who hold influence over children and may influence children's attitudes. Children's attitudes may also be influenced by their own beliefs and that of their peers, particularly during the sensitive teenage years.

6.4 *Attitude differences in Teenagers*

In a survey conducted by WISERD (2015) looking at Welsh in education, primary and secondary students were asked to respond to the statement 'how much do you like Welsh as a subject'. Of the pupils who took part in the study, only 28% responded that they liked Welsh as a subject 'a lot', whereas 32.5% responded 'not at all'. Those who attended Welsh-medium or bilingual schools or who were from '*y fro Gymraeg*', the area in which the sample

from the current study was from, were more likely to have a favourable attitude to Welsh in comparison to those from other areas of Wales, possibly due to Welsh being more common in the community, and possible also their L1.

Other research with pupils from Welsh-medium schools have revealed a negative attitude towards Welsh driven by the insistence of teachers that speaking English in school is ‘bad’. Simultaneous bilinguals in Musk’s (2010) study found teachers to be a bit ‘preachy’ (p.56) on this aspect, undermining their active belief that Welsh is important for them as individuals, and for the culture and future of Wales. The students in Musk’s study went on to state that they believed that the teachers were generally too strict on the matter and that this leads to students turning towards English deliberately only to rebel (Musk, 2010, p.57).

In comparison, the WISERD (2015) survey also found that students’ attitude towards Welsh was generally positive, with 75% stating that they thought it important that Welsh should ‘remain a living language’ and 65% though it ‘important to learn Welsh’. However, whether this positive attitude found in both studies translates into active use of Welsh is questionable, especially after leaving education, and particularly given the often-quoted anecdotal evidence that speakers learned Welsh at school but never used it as adults. However, only 59% of students stated it was ‘important to actually speak Welsh’ and only 45.3% of fluent Welsh students stated that they ‘would definitely speak Welsh when I am an adult’; this figure fell to 17.5% for those who had some Welsh ability (WISERD, 2015). Likewise, Hodges (2009) also found that most young people recognise the value of Welsh; however, Welsh use is generally reduced after leaving school (Gruffudd, 2000; Morris, 2007).

However, one could speculate the use of Welsh changes with age, with the use of Welsh by children thriving during primary education, while decreasing during secondary (Thomas & Roberts, 2011). The 2004 Welsh Language Use survey found that of the 57%

who stated they could speak Welsh fluently, there were larger densities of speakers among some ages than others. 72% of speakers aged 65 and over rated themselves as fluent Welsh speakers in comparison only 44% of those aged between 3 and 15 (Jones, 2008). However, regardless of fluency, the percentage of daily use of Welsh amongst children between the ages of 3 and 15 was high, most probably due to the influence of school (Jones, 2008; Jones 2012). In comparison, the daily use of Welsh among those aged between 16 and 29 was two thirds lower than other ages (Jones, 2008). This pattern provides support for Baker's (1985) view that Welsh language use reduces as the use of English by those from Welsh language backgrounds increase as they get older. Hodges (2009) reported similarly about an increase in English with family members by those from Welsh language backgrounds, especially in areas where English was considered the norm.

This pattern of language shift during the latter teenage years is interesting in the context of the present study since the study found catch-up behaviour among the 12- to 13-year-olds on plural and gender morphology but even greater distance between L1 and 2L1/L2 speakers at the older ages (see Chapter 3 & 4). Exploring other factors beyond input that may have influenced this behaviour is therefore important and helps provides a more holistic account of the factors influencing linguistic behaviour on the tasks presented in this thesis.

6.4.1 *Possible influences on Teenagers' behaviours*

Bilingual children are likely to develop their own beliefs about labels such as 'English' or 'Spanish', and what those labels represents (Carroll, 2017). These beliefs are likely to affect whether or not they use a particular language. At age 16, Welsh becomes an elected subject for those who remain in education. Price (2010), found at this point in their education, pupils use this transition as a chance to reconsider their ideas and assumptions about language, and thus change their language practices. Therefore, perhaps the daily use of Welsh may decrease with the increased need for English. Those who attend higher education

may see their use of Welsh decreasing with more English-medium education. Even when Welsh medium options are available, they might elect to attend English medium courses in the belief that English education would be more useful as preparation for English medium university courses, or for future employment opportunities (Davies & Davies, 2015).

However, Price (2010) reported that schoolchildren harboured more positive attitudes towards Welsh as well as an increase in its use, which came with a more mature view towards education. Hodges (2009) also found that Welsh language use in her sample increased during sixth form, stating that they had a “*heightened awareness and increased ownership of the Welsh language and its cultural and educational value*” (p.22). However, this was more apparent in those who studied Welsh at A or As level and may not therefore reflect the general attitude among student at this age. The low percentages of students who would speak Welsh as adults in WISERD’s (2015) study seem at odds with these findings, with positive attitude not necessarily transforming into practice.

Media Use

According to David Crystal (2000, p.141) “*an endangered language will progress if its speakers can make use of electronic technology*”. However, even though minority languages are used while communicating ‘offline’, English tends to be considered the language of social networking (Fleming & Debski, 2007). Research by Cunliffe, Morris and Prys (2013) found that 55.7% of children used English when writing on Facebook, 24.1% used both Welsh and English, while only 20.1% used Welsh exclusively. Although L1 Welsh were the ones to use Welsh most on Facebook (30% of the time) their use of English was slightly higher (39.8%). L2 Welsh students’ use of Welsh was far lower (English, 74.1% of the time, Welsh, 17.6%). However, the language used on social media by the participants within Cunliffe et al’s study was linked with the language used with friends ‘offline’, with

some students mentioning that their use of Welsh was dictated by habit. Therefore, if teenagers speak English ‘offline’ they will continue to do so on social media.

While there was a sense of ownership in that some students felt like their Facebook was a Welsh section of the internet (p.358), some students displayed apathy towards using Welsh instead of English, admitting that they could use Welsh, but they could not be bothered (p.359). Therefore, in the increasing presence of social networks and the Internet in the lives of teenagers, possibly apathy dictates whether they use Welsh rather than any negative attitude per se. This would coincide with studies showing positive attitudes yet reluctance to use the language.

Therefore, children who receive Welsh-medium education but do not make use of Welsh in different social contexts such as on social networks and outside of the classroom, risk domain specific acquisition. Particular in the face of emerging domains the maintenance of bilingualism in the long-term is reliant on the use of language across different social domains, such as technology (Escamilla, 1994). In this sense, minority language education, by itself, especially as an L2, does not guarantee that (Holmes, 2015).

6.4.2 *Peer Effects on Language Use and Attitudes.*

Similar to parental influence on children’s’ linguistic attitude, peers influence linguistic practices and attitudes (Dörnyei & Kormos 2000; Bartram, 2006), which may have a detrimental effect on successful language acquisition (Walqui, 2003). Past research has suggested that in the case of older children and young adults, change in language use can signify a shift from home language being the main factor determining language use and acquisition, to more social factors, particularly those involving peers (Musk, 2006). For example, peer pressure may lead to either feelings of embarrassment associated with speaking a particular language or can undermine efforts by parents or teachers to encourage its use (Bartram, 2006). Thus peer pressure can lead individuals to harbour negative attitudes

towards the language simply based on their desire to conform to peer group norms (Young, 1994), resulting in demotivation towards learning and/or acquiring the language that could, in theory, affect their ability to fully acquire the language.

Given the widespread knowledge of English, it only takes one English-speaking child to turn a conversation from a language like Welsh to English (Thomas & Roberts, 2011; see Hickey, 1997; 2001 for Irish). This reluctance to transfer the education based L2 linguistic knowledge into the wider social domain results in children, who speak the community dominant language at home, using their L1 in peer-to-peer interactions and doing so with peers whose L1 is the minority language. A survey by the Welsh Language Commissioner found that young people aged 3 to 15 were less likely to speak Welsh with their peers at home than at school. While 67% of children aged between 3 and 15 stated that they spoke Welsh at school, this number fell to 26% when speaking with friends (Welsh Language Commissioner, 2015). Unfortunately, this survey did not state whether younger children spoke Welsh more or less than older children.

Similar observations were found with L1 Castilian Spanish bilingual children learning Catalan as an L2 in school. Spanish remained the language of peer-peer interactions, both in and out of the classroom, with the students only switching to Catalan if interacting with the teachers (Vila, 1996). The dominant language is clearly favoured over the minority language and it is considered the ‘language of inclusion’ since all students having a fairly strong grasp of the dominant language (Gathercole & Thomas, 2009; Thomas & Roberts, 2011). Thus, conversations between peers in Wales would be likely to switch to the dominant language, English, in order to appease those with weaker Welsh language abilities or who are averse to its use. As with linguistic habits formed in the home with parents, the risk associated with this pattern is that once these habits have been set they may be irreversible (DeHouwer, 1990; Genesee, Nicoladis, & Paradis, 1995).

This focus on friendship groups is important since J. Morris (2014) discovered that students' friendship groups within Welsh medium and bilingual schools could be based on language, with the social groups of students from Welsh language backgrounds and from English language backgrounds being comprised of those from similar language backgrounds. Earlier research by Musk (2006), whilst representative of three linguistic group extremes, makes a distinction between three language background groups:

- (i) *Welsh-dominant bilinguals*: Those who speak Welsh at home, and are likely to condemn those who refuse to speak Welsh.
- (ii) *English-dominant bilinguals*: Those who speak English at home and prefer speaking English. These types tend to lack confidence in Welsh and thus are unlikely to use it after leaving school. Students in this group also tend to criticise any attempts to curb their use of English.
- (iii) *Those from homes where both languages are used*: Referred to by Musk (2006) as 'floaters', pupils in this group are likely to be confident using both languages, but accommodate to the dominant language of other pupils. However, while they may condemn those who refuse to speak Welsh, they might criticise teacher methods of imposing bilingualism in the school.

If pupils do not change their language of communication, continuing speaking their preferred language over the other, then language segregation in school friendship groups is likely (J. Morris, 2014). While 'floaters' who are comfortable speaking both languages will accommodate either group (Musk, 2006). If they identify themselves with an 'English clique' the pattern of speaking English risks forming a habit of speaking English rather than Welsh that may be hard to reverse and would have an effect on language choice, despite them having a positive opinion on the language (J. Morris, 2014).

It has been suggested that language assimilation, when the language use shifts to the predominantly spoken language, should occur in the largely Welsh-speaking areas, such as North West Wales, with those from English language homes more likely to use Welsh outside of school in comparison to less Welsh-speaking areas such as the North East (Estyn, 2013). J. Morris' (2014) findings contradict this claim, finding no differences between those from NW areas and NE areas of Wales, with those from English language homes continuing to minimise their use of Welsh outside of the classroom regardless of area. While some English-dominant pupils assimilated into the Welsh social group, this does not seem to be the usual pattern as reflected by the peer-group dynamics found in NW schools (J. Morris, 2014).

Therefore, those who are Welsh dominant are likely to show preference for the use of Welsh when conversing with their peers. However, they may not be in environments where they are enough of a majority to maintain the conversation in Welsh, as L1 English children chose not to use Welsh in domains outside of the classroom (Thomas, Apolloni & Lewis, 2014). This practice supports earlier suggestions that students may consider English to be the language of inclusion, with Welsh speakers turning to English to accommodate those who are English-dominant rather the other way round (Gathercole & Thomas, 2009; J. Morris, 2014). Likewise, Morris (2010) found that even older simultaneous bilingual students who come from families where both Welsh and English are spoken, with an equal grasp of both languages, also tended to report a higher use of English than Welsh in their peer-peer networks.

6.5 *Language Confidence*

Children's perception of their own language ability may also be a deciding factor in whether children choose to use a language and in their ultimate success with that language. Children's lack of willingness to use Welsh may stem, in some cases, from having a negative view of their own ability in the language. Anxiety towards the language, especially if

heightened by embarrassment brought on by the presence of peers, can lead to the reluctance to or reduced use despite actively partaking in language learning, particularly if those lessons require the verbalisation of words that may be difficult or hard to pronounce (Young, 1994). This behaviour could lead to a decline in their expressive use of the minority language, as they would have developed stronger receptive skills when learning under these conditions (Thomas & Roberts, 2011; Krashen, 1981).

Some argue that students decide whether to continue a task based on if they expect to be successful or not, and if they have the desire or incentive to complete the task (Pintrich & Schunk, 1996). Therefore, if a student perceives him or herself as incompetent in their ability to learn languages, this belief will feed into both the student's motivation to learn that language and their anxiety about the task (Pintrich & Schunk, 1996). Anxiety as a consequence of negative self-perception of competence has been found to correlate negatively with the child's motivation to learn a language (Baker & MacIntyre, 2000; Hashimoto, 2002; Pintrich & Schunk, 1996; Heinzmann, 2013). Therefore, as children become older they may become more accurate in perceiving their own ability, which could increase the likelihood that older children will perhaps be more affected by self-concept than younger children when acquiring languages (cf. issues relating to the Critical Period as discussed in Chapter 2), which could be hypothesised to affect their overall attainment of language.

In a Welsh-medium classroom environment, learning through the medium of a minority language does not always ensure full active participation in the use of the language by children. Some children who are slow learners, who prefer speaking in their stronger language have been found to avoid active participation in conversations in the minority language, keeping quiet in the class and using English to converse with friends (Thomas, Apolloni & Lewis, 2014). This approach to the acquisition process could lead to a more

passive engagement with the language, especially in the case of non-academic language, thus leading to more implicit rather than explicit learning (Ellis, 1993). Learning of this kind should lead to stronger receptive skills, which raises the expectation for children to be more successful on written tests in comparison to oral tests. However, as established in Chapters 3-5, when tested in the written form, L2 students, on the whole, do not ‘catch-up’ with L1 peers.

The effect of self-esteem on the continual use of Welsh outside the classroom is quite significant. Most students perceive their ability in Welsh to be weak, despite performing well in standardised examinations (Williams, 2002) with L2 speakers from English homes feeling at a disadvantage in comparison to their L1 Welsh peers, expressing the belief that coming from a Welsh speaking home is the only way to become fluent (Thomas & Roberts, 2011). Passive engagement with the language may be considered a causal factor for lack of confidence, while it might not hinder written or receptive knowledge; however, it might hinder the child’s confidence in production tasks or in social situations (Williams, 2002; Thomas & Roberts, 2011).

Self-perceived fluency, particular of oral skills, or within-speaker preference due to their perceived abilities may therefore lead to one language being used over the other (Woolard & Gahng, 1990). The result of having a reduced vocabulary (see Chapter 2 & 5), in any language, often results in borrowings from the other language. This is especially common when the individual is using their weaker language (Genesee, Nicoladis & Paradis, 1995). Because of the negative view of borrowings, individuals often perceive their use of borrowings as a reflection of their weakness in that language. This may discourage their continuous use of the L2. However, code switching happens in those who have greater ability in both languages (Meisel, 2007). Therefore, their self-perceived abilities in both languages could result in bilinguals’ lower confidence (Cenoz, 2003). This could lead to cases where the

minority language competence is developed through education; those learning the language will not use the language outside of the education context (Ó Giollagáin, et al. 2007). And perhaps does not lead to what MacIntyre et al. (1998) suggests the ultimate goal of language learning in education should be, namely ‘the willingness to communicate’ in that language in different contexts outside of the classroom.

J. Morris (2014) found that teenagers’ use of Welsh correlated significantly with their self-perceived abilities in Welsh; that is, those who used Welsh the most had more confidence in speaking it (however, some students had low self-rated abilities but high Welsh use). He also found that the students’ positive attitudes to Welsh was moderately correlated with that of their self-perceived abilities, and in the case of students from English language backgrounds, negative attitudes may have come from negative experiences or comments on the speakers’ ability, thus lowering their self-perceived abilities.

Differences in responses across the different language groups in Morris’s study could explain why English–dominant bilinguals prefer to use English with friends over Welsh, even if speaking to Welsh dominant bilinguals whose preferred language is Welsh, and use English in domains other than the classroom (Lewis, 2003, 2006; Thomas & Roberts, 2011; Thomas, Lewis & Apolloni, 2012). Thomas and Roberts (2011) found some children from Welsh-speaking homes stated that they spoke Welsh better than English, conversely to those from English-speaking homes, where 95.4% perceiving their English to be better than their Welsh. These findings are echoed by J. Morris (2014) who found that teenagers from English language homes rated their Welsh speaking abilities lower than that of their English and, surprisingly did not rate their Welsh to be equal to their English, despite Welsh-medium education. Being in education within regions of North West Wales where Welsh is the dominant language of the school and of the wider community, did not instil confidence in the L2 Welsh students. L2 Welsh children continued to use their L1 throughout their day-to-day

lives, minimising their use of Welsh, which affected their confidence in using the language (J. Morris, 2014).

Even with young adults, self-perceived competence has been seen as a factor in whether or not Welsh is perceived positively. Laugharne (2007) suggested that university students' use of and attitudes towards Welsh were influenced by the speakers' self-perceived competence, with a higher perceived competence in Welsh linked to a more positive attitude, suggesting that self-perception of language abilities is a key contributor to the speakers' predisposition to revert back to using their L1 rather than the L2. Therefore, if individuals, even those who are from homes where Welsh is partially spoken still harbour negative perceptions of their own abilities at university level, it is unlikely they will continue to use Welsh as adults.

It is clear that perceived ability, and self-confidence in using the language could result in the children's long-term ultimate linguistic achievements being affected, and could inadvertently influence the potential success of language transmission – possibly more so than attitude.

6.6 Summary

To summarise, a concern related to the prolonged differences in L1 and L2/2L1 speakers' knowledge of some forms, as found in Chapter 3-5, is whether these patterns of results are down to the children not actively engaging with the minority language, in (i) social interactions, where language choice is somewhat a free choice; or within (ii) the Welsh-medium classroom where the expected language is Welsh, or (iii) whether they favour the majority or dominant community language, which is often the child's home language or mother tongue.

In the context of Wales, since the dominant language is English, constant exposure to English is available. The linguistic choices made at school and during recreation are capable

of having a strong effect on the continuing linguistic development of teenagers and the language of interaction with peers (Morris, 2010). These factors could in theory influence whether this ‘catch-up’ occurs or not. Regardless of the reliance on the dominant language, children do have a clear idea of how to increase their use of Welsh, which includes increasing the language in their environment. However, whether or not they decide to utilise these methods is a different story. Therefore, given that within our sample, teenagers continue to demonstrate differential patterns of behaviour across language groups, the next section examines the influence of (i) overall use of Welsh, (ii) use of Welsh with friends, and (iii) children’s attitudes towards Welsh, code-mixing and language confidence on their performance on the tasks presented in this thesis.

Predictions

Working within an input-driven approach to bilingual language acquisition, if the amount of exposure is important:

- Participants declaring a higher degree of overall use of Welsh will have higher scores within each study test in comparison to those declaring a lower degree of use;
- Participants who use Welsh the most with friends will perform higher than those using Welsh less often with friends on each test;
- Participant with higher confidence with the language will perform higher than those with lower confidence;
- Participants expressing the most favourable attitudes towards Welsh, as noted on the questionnaire, will outperform those with less favourable attitudes on each test.
- It is also expected that media engagement will also play a part in participants’ overall success on each test, however to a lesser extent, therefore the scores of the participants who engage with Welsh across these domains will be positively correlated with their overall scores.

6.7 Methodology

Linguistic Stimuli

Participants were given a questionnaire (see Appendix B). This was made up of five key components: (i) questions regarding demographic information, such as living history, parental education and date of birth. (ii) Their use of each language and which language was used when speaking to different family members, friends and acquaintances and in which situations. (iii) The participants' attitudes to Welsh and English. (iv) The participants' self-esteem, and their self-assessed proficiency in each language; and (v) the factors that influence their language use. These questions were a mix of open ended and multiple-choice questions. For example, the first part of the questionnaire asked general information such as age, gender, and living history and which language was used when speaking to different family members, friends and acquaintances and in which situations. They were also asked if certain factors, such as language of parents, friends etc. influenced their decision to use or not to use Welsh. Participants were also asked to rank a series of statements in terms of how much they agreed with the statement on a scale of 1-10. These were a mix of statements regarding attitudes to Welsh, English, code switching, and their self-confidence when using each of the two languages.

Non-linguistic Stimuli

All questions were presented to participants in the form of a booklet. Most questions requiring a forced-choice response were presented with a table underneath for participants to tick the option appropriate for them. Other, more open-ended questions had a larger space for participants to write out a more elaborative answer. For questions requiring participants to rate statements, the participants were asked to circle a number on a scale of 1-10 underneath each statement.

Procedure

Participants were asked to read all the questions and answer each question when and how it applied to them. Participants were also given an option not to answer any question that they felt uncomfortable answering.

Scoring

Each response was given a ranked value, with Welsh ranked higher than English. Items in the questionnaire were scored from 1 to 10, 10 being strongly agree. When a given statement was presented in favour of English or with a negative connotation towards Welsh or bilingualism, these items were reverse scored with 10 given for the most overall positive response towards the Welsh language to 1 for the least positive.

Participants

Data from the previous studies were re-analysed using participants' Overall Use of Welsh (OUW) and their Use of Welsh with Friends (WwF) as Between Subjects variables. Three new groups of participants were created, low use of Welsh (under 45% of the time), moderate use of Welsh (between 55-70% of the time), and high use of Welsh (over 80% of the time). Those whose use of Welsh was in-between each category were excluded from analysis to establish a clear difference between groups. Consequently, the total numbers of participants for these analyses was lower than for the previous analyses, and therefore data were collapsed across the two age groups in order that any statistical analyses would be meaningful. The final number of participants per group is noted in tables 6.1 and 6.2.

Table 6.1: Number of participants across each group in OUW analysis

Test	Overall Use of Welsh (%)			Total
	Under 45%	55-70%	Over 80%	
Vocabulary	19	36	42	97
Gender	24	41	45	110
Plural	26	43	47	116

Table 6.2: Number of participants across each group in WwF analysis

Test	Welsh with Friends (%)			Total
	Under 45%	55-70%	Over 80%	
Vocabulary	18	28	42	97
Gender	24	41	45	110
Plural	26	43	47	116

6.8 Results

6.8.1 Analysis 1: Overall Use of Welsh X Scores on Tests

A series of One Way ANOVAs was run on the data from each test to establish if there was a significant difference between the participants' scores on each test according to participants' self-reported OUW. In each case, the between groups IV was OUW (Under 45%, 55-70%, Over 80%), and the DV was their overall score on each language test. Mean scores on each test according to the OUW group are shown in figure 6.1.

Grammatical Gender (Study 1) X Overall Use of Welsh

In line with the prediction, a main effect of OUW was revealed [$F(2, 107)=12.224$, $p=.000$]. A Bonferroni post hoc test found that this significance was due to those who reported 80%+ use of Welsh outperforming those who reported less than 45% [$p=.000$]. The analysis also revealed the 55-70% group were significantly outperforming the <45% group [$p=.009$]. However, there was no significant difference between the 55-70% and 80%+ group [$p=.096$], suggesting that if participants' use of Welsh is less than 45% then this compromises their ability to acquire grammatical gender at the same rate as (or to catch up with) their peers in Welsh.

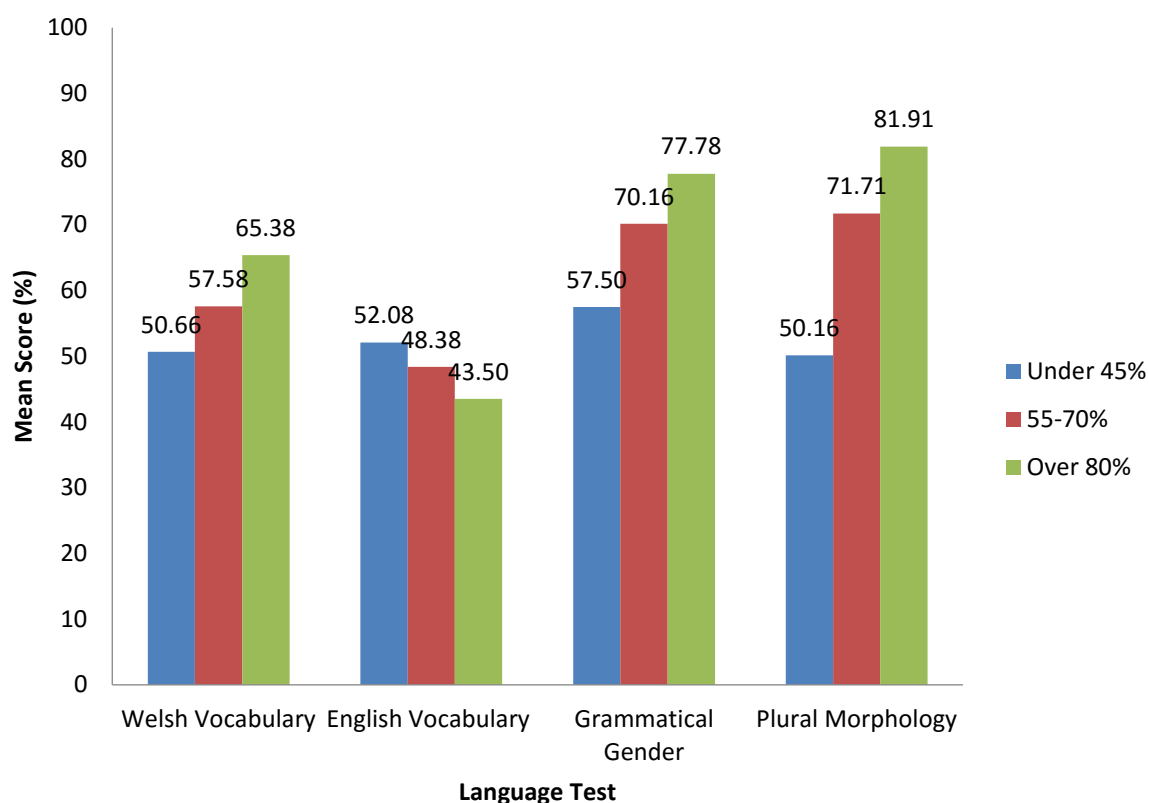


Figure 6.1: The influence of Overall Use of Welsh on teenagers' language abilities

Plural Morphology (Study 2) X Overall Language Use

As with grammatical gender, there was a strong effect of OUW for plural morphology [$F(2, 113)=26.403, p=.000$]. A Bonferonni post hoc test revealed that the significance was due to participants who reported speaking Welsh <45% of the time being outperformed by both the 55-70% [$p=.000$] and 80%+ group [$p=.000$]. However, there was a significant difference between the 55-70% and 80%+ group [$p=.024$], although mean performance of those using Welsh 55-70% of the time [$M=71.71\%$] was closer to that of those using Welsh over 80% of the time [$M=81.91\%$] than those using it less than 45% of the time [$M=50.16\%$]. These results suggest that, for plural morphology, regular use of Welsh over 80% of the time leads to greater gains and faster approximations with adult norms, over and above those achieved by speakers using Welsh less than 70% of the time. Although those experiencing

55-70% input are performing more like those receiving 80% and are continuing with the ‘catch up’ process.

Vocabulary (Study 3) X Overall Language Use

Scores on both VA and VC vocabulary tests were combined to give an overall score for both Welsh and English vocabulary. For Welsh vocabulary, there was a main effect of language use within the participant subset [$F(2, 94)=4.474, p=.014$]. Post hoc test revealed a significant effect between those whose OUW was over 80% and under 45% [$p=.015$], however there was no significant difference between the 80%+ and the 55-70% groups [$p=.201$] and there was also no significant difference between the <45% group and 55-70% group [$p=.571$]. Therefore, low use of Welsh could possibly lead to lower Welsh vocabulary, although it is less affected than plural morphology and grammatical gender as the mean difference between those reporting 80+% and under 45% OUW was smaller [$M=14.72\%$] in comparison to grammatical gender [$M=20.28\%$] and plural morphology [$M=31.75\%$]. Conversely, there was no main effect of language use for English vocabulary with all subsets performing comparably [$F(2, 94)=1.551, p=.218$], suggesting that high use of Welsh does not lead to poor English vocabulary scores, although the lowest score was found among those who reported using Welsh over 80% of the time [$M=43.5$].

6.8.2 Analysis 2: Use of Welsh with Friends X Scores on Tasks

As with Analysis 1, a series of One Way ANOVAs was conducted, this time using Use of Welsh with Friends (WwF) as a variable. Participants were grouped into the same usage categories as Analysis 1 (see table 6.2).

Grammatical Gender (Study 1) X Welsh with Friends

Results of the One Way ANOVA revealed a significant effect of WwF [$F(2, 103)=10.355, p=.000$]. A Bonferonni post hoc test revealed this effect was due to the 80%+ group outperforming both the <45% group [$p=.000$] and the 55-70% group [$p=.011$]. There

was no effect between the <45% and 55-70% group [$p=.336$]. These results suggest that the greater the use of Welsh with friends, the quicker the children approach competence with the structure.

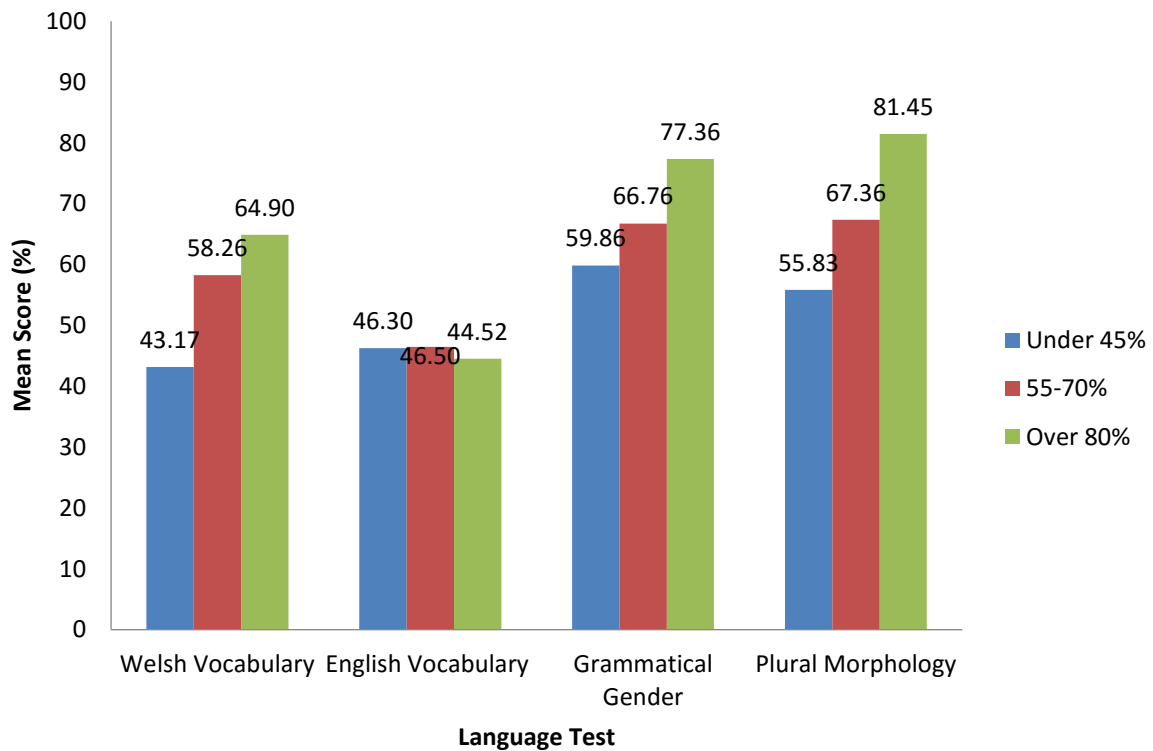


Figure 6.2: Influence of speaking Welsh with Friends on teenagers' language abilities

Plural Morphology (Study 2) X Welsh with Friends

As with the previous analysis, there was also a significant effect of WwF [$F(2, 109)=18.936, p=.000$]. Post hoc test revealed this to be due to the performance of the 80%+ group to be significantly higher in comparison to the <45% group [$p=.000$] and the 55-70% group [$p=.001$]. Participants who reported between 55-70% of Welsh with friends were also performing significantly higher than the <45% group [$p=.041$]. These results suggest that participants who report higher use of Welsh with friends tend to perform best on measures of plural morphology, those who report <45% perform worse, with those reporting between 55-70% somewhere in between.

Vocabulary (Study 3) X Welsh with Friends

As with the previous two analyses, there was also a significant effect of WwF for measures of Welsh vocabulary [$F(2, 89)=10.581, p=.000$]. Post hoc test revealed the effect was due to the 80%+ performing significantly higher than the under 45% group [$p=.000$], and the 55-70% performing significantly higher than the under 45% group [$p=.013$]. However, there was no significant difference between the 55-70% and 80%+ groups [$p=.320$], which suggests that participants who reported more than 55% use of Welsh with friends have higher Welsh vocabulary in comparison to those who reported less than 45%. For English vocabulary, there was no significant differences between groups [$p=.902$].

Summary

It Is clear that the participants who reported less than 45% use of Welsh are under a disadvantage in relation to their aquisition of Welsh language structures. While it is difficut to untangle the effects of home language from measures of overall language use, the results presented above strongly suggest that, in the acquisition of Welsh vocabulary, children need to be using Welsh around 55-70% of the time to acquire comparable vocabulary to those who use Welsh over 80% of the time. However, the acquisition of morphology seemed to more affected by use in comparison to Welsh vocabulary, with children needing to speak Welsh over 80% of the time in order to be succesful in their of the aquisiton of morphology, with those who spoke less still lagging behind. Yet, in terms of ultimate attainment, it is worth noting even using Welsh over 80% of the time does not result in full acquisition of both plural, gender morphology nor Welsh vocabluary. Therefore, it must be concluded that other social factors need to be considered when assessing childrens attainemnt of Welsh. Accordingly, the next section will assess the influence of more social factors have on childrens langauge test scores.

6.8.3 Analysis 3: Attitude towards Welsh and Code-Mixing, and Language Confidence

In order to establish the relationship between the participants' test scores and their attitude a one-tailed Pearson's correlation was conducted on the data. As noted above, information on the participants' attitudes towards Welsh, code-mixing, and their language confidence was collected via a 19 item questionnaire. Participants were asked to rank each statement on a scale of 1 to 10, 10 being strongly agree and 1 being strongly disagree. The correlations were run on each of the key factors (Attitude, Code-Mixing, and Confidence) separately to assess the relationship between each factor individually for each test score. Given that it was believed that attitudes would differ between different bilingual groups, each group was analysed individually to assess whether this was the case. While most items were not correlated (see table 6.4), the next section presents the most noteworthy correlation results.

Attitude X Test Scores

These results show that, in general, and in keeping with previous studies highlighted earlier in the chapter, the teenagers in this study were generally very positive towards the Welsh language. They valued speaking Welsh, and they believed it was important for children to learn Welsh. At the same time, they did question the need to learn Welsh if one intended to leave Wales and there was quite moderate to strong disagreement. Particularly among L1 Welsh bilinguals [L1W: M=75.9%; 2L1: M=66.2%; L2W: M=64.5%] that it was better to learn French if they wanted to get on in the world, whilst, at the same time, accepting that speaking Welsh gets them a better job [L1W: M=74.7%; 2L1: M=68.9%; L2W: M=65.1%]. From a social point of view, however, a large majority thought that it was important to speak a language everyone understands when socialising [L1W: M=83.5%; 2L1: M=77.8%; L2W: M=79.0%], which automatically triggers the greater use of English in most situations. However, L2 and 2L1 respondents agreed that if one friend dislikes speaking

Welsh it is important for the conversation to switch to English [2L1: M=56.8%; L2W: M=61.0%], although more teenagers disagreed than agreed with this statement, with greater number of L1 Welsh speakers disagreeing [M=76.9%]. Finally, it was clear from the responses to question 8 that most children, regardless of their home language background, thought that individuals, in general, do not mind learning Welsh [L1W: M=82.0%; 2L1: M=78.1%; L2W: M=75.0%] and that speaking Welsh is not a marker of true Welshness.

*Table 6.3: Descriptive Statistics of participants' responses to each attitude statement in % (*Questions 2, 4, 7, and 8 were reverse scored)*

<i>Statement</i>	L1 Welsh			2L1			L2 Welsh		
	<i>n</i>	<i>M</i>	<i>S.D</i>	<i>n</i>	<i>M</i>	<i>S.D</i>	<i>n</i>	<i>M</i>	<i>S.D</i>
1. I value speaking Welsh	93	91.5	2.31	38	86.8	2.52	41	77.3	2.52
2. It's best to learn French than Welsh if you want to get on in the world	91	75.9	2.56	37	66.2	2.83	40	64.5	2.80
3. Speaking Welsh gets you a better job	92	74.7	2.17	37	68.9	2.70	41	65.1	2.60
4. There is no point learning Welsh if you intend to leave Wales	92	78.6	2.71	37	77.3	2.63	41	72.2	2.62
5. It's important for children to learn Welsh	92	91.5	1.73	37	85.1	1.88	41	76.3	2.70
6. It's important to speak a language everyone understands when socialising	92	83.5	1.99	37	77.8	2.35	41	79.0	2.25
7. If one friend dislikes speaking Welsh it's important for the conversation to switch to English	92	76.9	2.06	37	56.8	3.06	41	61.0	2.60
8. No one I know likes learning Welsh	90	82.0	2.44	36	78.1	2.39	40	75.0	2.45
9. You are not truly Welsh unless you speak Welsh	91	57.5	3.25	37	46.5	2.92	40	45.3	2.94

L1 Welsh

Whilst the descriptive statistics revealed a fairly strong agreement or disagreement with each statement (see table 6.3), only a few statements were significantly correlated with performance on the tasks (see table 6.4). In particular, views about the usefulness of learning Welsh if one intends to leave Wales correlated with scores on the gender task and beliefs

regarding how much learners liked learning Welsh, and the relationship between language and Welshness correlated with their scores on the plural task. That is, those who declared the most disagreement with the statement regarding there being no point learning Welsh if intending to live outside Wales tended to be those who performed best on the gender task, and those who thought that learning Welsh was a likable process but was not a clear marker of Welshness tended to be those who scored the best on the plural task.

*Table 6.4: Relationship between participants' agreement with statements and their test scores ** Correlation is significant at the 0.01 level * Correlation is significant at the 0.05 level*

	L1 Welsh				2L1				L2 Welsh			
	Welsh Vocab	English Vocab	Gender	Plural	Welsh Vocab	English Vocab	Gender	Plural	Welsh Vocab	English Vocab	Gender	Plural
1	-.084	-.149	.076	.025	.263	.364*	.373*	.468**	.331	.227	.251	.365*
2	-.132	-.146	.055	.116	-.106	-.225	.355*	.077	-.355	-.408*	.159	.032
3	-.005	-.119	.172	.084	-.087	-.159	-.006	.198	.178	.275	.235	.213
4	-.007	-.146	.122	.177	.039	.135	.072	.254	.216	.093	.178	-.01
5	.078	-.011	.099	.113	.224	.119	.329	.377*	.254	.219	.116	.162
6	-.225	-.105	.184	-.064	.218	.291	.15	.344*	.212	.265	.118	.023
7	.135	.039	.11	.152	.364*	.151	.138	.484**	.188	.114	.287	.138
8	-.204	-.294*	.133	.138	.176	.139	.314	.22	.225	.172	.071	.124
9	.332**	.133	.079	.411**	-.25	-.354	-.169	-.206	-.177	-.196	-.055	-.117

2L1

Questions 3, 4, 7, 8 and 9 correlated with some of the test scores among this group of speakers, but in a complex way. In particular, those who thought that 'Speaking Welsh gets you a better job' tended to score highest on the plural test, and those who thought that learning Welsh has no value if one intends to leave Wales scored highest on English vocabulary, which is unsurprising, but they also scored highest on gender. Those who disagreed with the need to switch language to suit your friend's dislike of Welsh and those who did not know anyone who likes learning Welsh tended to have higher vocabulary scores. There was a significant negative correlation between views about the role of language as a marker of true Welshness and Welsh vocabulary scores, suggesting that those who think that the language is part of your identity score higher on Welsh vocabulary than those who do not.

L2 Welsh

In general, while descriptive statistics revealed a moderately positive view on the Welsh language, most responses to the questionnaire items were not correlated with participants' performance on any of the tasks. However, there was a weak positive correlation between L2 speakers' plural scores and the value they place on the Welsh language. There was also a moderately negative correlation between responses to Q.2 and their performance on any of the tasks, suggesting that attitude towards Welsh had no bearing on their performance at all.

Language Confidence X Test Scores

L1 Welsh participants tended to disagree more with negative statements about confidence (see table 6.5), suggesting that these participants are generally fairly confident in their Welsh language ability [overall M=35.2%]. Responses from L2 Welsh and 2L1 bilinguals, on the other hand, indicated lower confidence in comparison to that of the L1 Welsh bilinguals [L2W: M=54.5%; 2L1: M=50.84%]. Most notably, agreement to the statement that their Welsh was not as good as others was higher within the 2L1 [M=64.3%] and L2 Welsh bilinguals [M=62.2%] (cf. L1 Welsh bilinguals [M=37.9%]). A similar pattern was seen in responses to Q.4, "I feel self-conscious or shy when speaking Welsh", with a distinctly higher response seen within the 2L1 and L2 Welsh bilinguals. There was also moderate agreement across all groups with the statement that they felt pressure to speak 'pure' Welsh, with similar responses seen in their agreement with Q.3 regarding their use of borrowings, suggesting that even L1 Welsh bilinguals feel some pressure to speak 'pure' Welsh and that the use of English when speaking Welsh does still cause some trepidation (see table 6.5).

Interestingly, when probed as to whether they thought if their language skills were not good enough, then there would no point in speaking it, L1 Welsh and 2L1 bilinguals tended

to disagree [L1W: M=24.7%; 2L1: M=34.6%], suggesting that regardless of their view of their language ability this wouldn't necessarily lead to them not using Welsh. L2 Welsh bilinguals displayed greater agreement with the statement albeit not a strong agreement [M=42.5%], which may signify a feeling of anxiety among L2 speakers when using the language, which could result in a reluctance to use it.

Table 6.5: Descriptive Statistics of participants' agreement with self-esteem statements in %

<i>Statement</i>	L1 Welsh			2L1			L2 Welsh		
	<i>n</i>	<i>M</i>	<i>S.D</i>	<i>n</i>	<i>M</i>	<i>S.D</i>	<i>n</i>	<i>M</i>	<i>S.D</i>
1. I feel like my Welsh is not as good as others'	91	37.9	3.05	37	64.3	2.72	41	62.2	2.58
2. If my Welsh isn't good enough, then there is no point speaking it	91	24.7	2.51	37	34.6	2.79	40	42.5	2.42
3. I feel like I overuse English words when speaking Welsh	93	45.4	3.00	38	56.8	3.06	41	55.1	2.59
4. I feel self-conscious or shy when speaking Welsh	91	24.3	2.43	37	46.8	3.64	40	58.8	2.88
5. I feel pressure to speak 'pure' Welsh	91	43.7	2.87	36	51.7	2.72	40	53.8	2.88

L1 Welsh

While descriptive statistics revealed a fairly confident view of their Welsh language ability, there were some notable significant correlations. Particularly, those who thought that their Welsh was not as good as others' tended to have lower scores across all Welsh language tests. Responses to Q.2 and Q.4 were correlated with plural test scores, meaning that the more positive they felt about using their Welsh regardless of ability and the more use of borrowings they made in their Welsh the better they performed on the plural task. Moreover, the more confident students were at using Welsh (Q3), and the less anxious they were about the correctness of their Welsh (Q4), the better their performance on the gender task.

Table 6.6: Relationship between participants' agreement with statements and their test scores ** Correlation is significant at the 0.01 level * Correlation is significant at the 0.05 level

	L1 Welsh				2L1				L2 Welsh			
	Welsh Vocab	English Vocab	Gender	Plural	Welsh Vocab	English Vocab	Gender	Plural	Welsh Vocab	English Vocab	Gender	Plural
1	-.336**	-.117	-.381**	-.360**	-.311	-.106	-.220	-.470**	.520**	.463**	-.069	.249
2	-.112	.004	-.0204	-.0297**	-.219	-.190	-.356*	-.492**	.001	.152	.078	-.056
3	.007	.039	-.0246*	0.033	-.097	-.041	-.165	-.138	.182	.109	.107	.193
4	-.049	.042	-.0244*	-.0270*	-.249	-.099	-.254	-.409*	.043	.044	-.278	-.043
5	-.153	-.173	-.0026	-0.001	-.028	-.214	-.136	-.204	.064	.028	.031	.284

2L1

For simultaneous bilinguals, the belief that their Welsh abilities was not as good as others' (Q.1) was negatively correlated with their plural test scores (see table 6.6), suggesting that those who disagreed most with this statement had a stronger grasp of plural morphology. This relationship was also found in their agreement with the statement if their Welsh wasn't good enough, then there is no point speaking it (Q.2), with a significant negative correlation found between their disagreement with this statement and higher test scores on both the plural and gender test. A lack of shyness when using Welsh (Q.4) was also related to higher plural scores (see table 6.6). These results suggest for 2L1 bilinguals, confidence with the language is somewhat related to higher competence of some morphosyntactic structures.

L2 Welsh

Unlike L1 Welsh and 2L1 bilinguals, results revealed mostly positive relationships between responses to each statements and the participants' test scores. However, only two of these were significantly so. Both higher Welsh and English vocabulary were significantly related with agreement that the participants believed that their Welsh was not as good as that of others'. This indicates that possibly having lower confidence does not lead to lower Welsh vocabulary scores, suggesting that participants are underestimating their own language ability in comparison to their actual abilities. The relationship between higher English vocabulary

results and lower confidence in Welsh is most likely due to the participants being dominant in English, and thus have stronger English skills.

Code-Mixing X Test Scores

Descriptive statistics revealed a fairly positive attitude towards code-mixing for 2L1 and L2 Welsh bilinguals [overall: 2L1: M=60.63%; L2W: M=55.64%]. L1 Welsh bilinguals also reported a fairly positive attitude towards code-mixing; however, it was slightly lower in comparison to their peers [M=48.43%]. ‘Wenglish’ – a term for speaking a combination of Welsh and English – was taken as being an example of bad ‘Welsh’ more so among the sample of L1 Welsh bilinguals [M=55.8%] and 2L1 bilinguals [2L1: M=53.5%] than among the L2 bilinguals [L2W: M=47.8%]. In fact, both the 2L1 and L2 Welsh bilinguals thought speaking ‘Wenglish’ as natural to them, and spoke it often (see table 6.7).

However, the agreement with this statement was slightly lower within the L1 Welsh cohort, notably so in the agreement as to whether they spoke ‘Wenglish’ often. While they reported more disagreement with these statements (see table 6.7), they were more in agreement with the statement that mixing languages was a natural way of speaking [M=54.4%], even though they were less in agreement that it was natural for them. Interestingly, when probed as to whether being reprimanded for speaking ‘Wenglish’ by teachers affected their use of Welsh; agreement was much lower within the L1 Welsh bilinguals in comparison to the 2L1 and L2 Welsh bilinguals. This could suggest that the 2L1 and L2 Welsh bilinguals were slightly more sensitive to teachers’ criticisms of their language choices.

Table 6.7: Descriptive statistics of participants' agreement with code-mixing statements in %.

<i>Statement</i>	L1 Welsh			2L1			L2 Welsh		
	<i>n</i>	<i>M</i>	<i>S.D</i>	<i>n</i>	<i>M</i>	<i>S.D</i>	<i>n</i>	<i>M</i>	<i>S.D</i>
1. Speaking 'Wenglish' (mixing languages) is an example of 'bad' Welsh	90	55.8	2.95	37	53.5	2.93	40	47.8	2.8
2. It's impossible to speak Welsh without English	92	52.1	3.23	37	61.1	2.77	40	60.0	3.07
3. Being told off by teachers for speaking 'Wenglish' (mixing languages) puts me off speaking Welsh	92	32.6	2.82	36	55.8	3.16	38	49.2	3.37
4. I speak 'Wenglish' (mixing languages) often	91	48.7	3.32	37	73.0	2.89	40	60.0	2.98
5. Mixing languages is a natural way of speaking	93	54.4	2.89	38	64.7	2.81	41	58.0	2.37
6. Some subjects are impossible to discuss in Welsh	93	45.4	2.89	38	52.6	3.28	41	53.1	2.83
7. Speaking 'Wenglish' is natural to me	93	49.4	3.36	38	63.7	3.13	41	61.4	2.92

L1 Welsh

As with the previous correlations, most responses were not correlated with participants' test scores (see table 6.8). However, Person's correlation analysis revealed some significant relationship between the participants' response to certain statements and their test scores. Particularly, the disagreement that some subjects were impossible to discuss in Welsh was correlated significantly with their scores across all Welsh language tests, suggesting that L1 pupils feel free and able to discuss all academic subjects in Welsh. There was also weak significant correlation between agreement with Q.3, and lower Welsh vocabulary scores, suggesting that if students feel put off speaking Welsh by teachers then in this instance, it is related to lower Welsh vocabulary scores.

2L1

While descriptive statistics revealed a fairly positive view on code-mixing (see table 6.8), analysis only revealed one significant correlation. Interestingly, results of the Pearson's correlation revealed a moderate significance between participants' agreement that mixing languages was a natural way of speaking and lower English language scores.

Table 6.8: Relationship between participants' agreement with code-switching statements and their test scores
 ** Correlation is significant at the 0.01 level * Correlation is significant at the 0.05 level

	L1 Welsh				2L1				L2 Welsh			
	Welsh Vocab	English Vocab	Gender	Plural	Welsh Vocab	English Vocab	Gender	Plural	Welsh Vocab	English Vocab	Gender	Plural
1	.079	.027	-.038	.131	-.018	-.046	.008	-.267	-.116	-.034	-.324	.110
2	-.046	.083	-.032	-.083	-.197	-.294	-.123	-.273	.193	.187	.144	.346*
3	-.241*	-.031	-.145	-.159	-.015	.148	-.073	-.021	-.038	-.133	-.010	.170
4	.021	.105	-.017	.017	-.305	-.515**	-.087	.023	-.068	-.209	.181	.210
5	.077	.151	-.073	.001	-.056	-.069	.047	-.130	.001	-.086	-.032	.000
6	-.391**	-.215	-.408**	-.395**	-.049	.154	.037	-.222	.140	.207	.055	.079
7	.111	.153	.014	-.100	-.121	-.178	-.150	-.056	.191	.190	.223	.206

L2 Welsh

As with the 2L1 bilingual participants, while results revealed a fairly positive view on code-mixing, there was only one significant correlation. Results from the Pearson's correlation found a significant relationship between agreement that it was impossible to speak Welsh without English and higher plural scores.

6.8.4 Analysis 4: Relationship between Variables

Given the clear relationship between aspects of language use and attitude, code-mixing and confidence and performance on the tasks, as described above, the following analyses aimed to establish to what extent these variables impact their Welsh language attainment. In order to explore this, a multiple regression analysis was conducted on the whole data set to establish the relationship between Test Scores (DV) and participants' Use of Welsh (UoW), Use of Welsh with Friends (WwF), their overall Language Confidence and Attitude to Welsh (IVs). For this analysis, items from Analysis 3 were grouped into two separate variables consisting of their overall scores for measures of Confidence and Attitude. Whilst the previous analysis looked at the relationship between various aspects of the questionnaire and scores on the tests for each language group separately, the regression formula was applied in order to identify to what degree each factor influence any variance in the data.

Grammatical Gender X Language Use, Attitude and Confidence

L1 Welsh

Three IVs were significantly correlated with the participants' overall Grammatical Gender scores, suggesting a significant relationship between having a higher overall UoW [$p=.043$], higher WwF [$p=.024$], and Confidence [$p=.003$] and having higher Grammatical Gender abilities. Attitude was not significantly correlated in this case [$p=.161$]. The multiple regression with all four predictors was also not significant [$p=.083$; $R^2=.102$], suggesting that none of the variables explained any variance or predicted the scores on this test for this group.

2L1

The three IVs were significantly correlated with the participants' overall Grammatical Gender scores, suggesting a significant relationship between having a higher overall UoW [$p=.013$], higher WwF [$p=.012$], and higher Attitude [$p=.009$] and having higher Grammatical Gender abilities. Confidence was not significant [$p=.052$]. The multiple regression with all four predictors was also significant [$F(4, 35)=2.990$, $p=.034$], with an $R^2=.278$, suggesting that the four predictors together accounted for 27% of variance in the scores. However, none of the IVs significantly predicted the participants' Gender scores (see table 6.9).

Table 6.9: Results of regression analysis for Grammatical Gender scores of 2L1 bilinguals.

Factor	Unstandardized Coefficients		Standardized Coefficients	Sig.
	B	SE	β	
(constant)	25.891	8.083		0.002
Overall Use of Welsh	0.264	0.168	0.263	0.119
Use of Welsh with Friends	0.157	0.158	0.165	0.324
Attitude	.274	.185	.268	0.331
Overall Language Confidence	0.198	0.12	0.172	0.103

L2 Welsh

Of the four IVs, only Overall Confidence was positively correlated with their grammatical gender scores [$p=.025$], suggesting there is a significant relationship between higher Language Confidence and participants' higher grammatical gender knowledge. The multiple regression with all four predictors was not significant [$p=.330$, $R^2=.130$], with no variables significantly contributing to the participants overall Grammatical Gender scores.

Plural Morphology X Language Use, Attitude and Confidence

L1 Welsh

Within this bilingual group, all four IVs were significantly correlated, suggesting that high UoW and WwF [both $p=.003$] were related with higher plural scores. The same was found for higher Confidence [$p=.001$] and Attitude [$p=.042$]. The multiple regression analysis was significant [$F(4, 87)=3.240$, $p=.016$] with the factors accounting for 13% of the variance in the scores [$R^2=.135$]. However, none of the factors significantly predicted to the scores directly.

2L1

Of the four IVs, only two were significantly correlated. These were Confidence [$p=.000$] and Attitude [$p=.010$]. Overall UoW and WwF was not significant [$p=.342$; $p=.392$]. The multiple regression was also significant [$F(4, 36)=3.856$, $p=.011$], with the four predictors accounting for 32% of the variance [$R^2=.325$]. However, the only factor to predict the scores was Confidence (see table 6.10). Given the negative coefficient value for the UoW ($\beta=-.171$), it could suggest that the more use of Welsh could see the scores on the plural test decrease within this bilingual group. However, it was insignificant.

Table 6.10: Results of regression analysis for 2L1 bilinguals on Plural Morphology:

Factor	Unstandardized Coefficients		Standardized Coefficients	Sig.
	B	SE	β	
(constant)	36.093	15.700		.028
Overall Use of Welsh	-.254	.311	-.171	.458
Use of Welsh with Friends	.118	.171	.142	.419
Attitude	.117	.156	.129	.496
Overall Language Confidence	.456	.156	.519	.006

L2 Welsh

Of the four IVs, three were significantly correlated. These were UoW, WwF, [both $p=.026$], and Confidence [$p=.001$]. Attitude was not significant [$p=.162$]. The multiple regression was also significant [$F(4, 40)=3.244, p=.023$], with the four predictors accounting for 26% of the variance [$R^2=.265$]. However, the only factor to predict the scores was Confidence (see table 6.11).

Table 6.11: Results of regression analysis for L2 Welsh bilinguals on Plural Morphology:

Factor	Unstandardized Coefficients		Standardized Coefficients	Sig.
	B	SE	β	
(constant)	-7.847	21.228		.714
Overall Use of Welsh	.495	.603	.190	.417
Use of Welsh with Friends	-.009	.322	-.006	.978
Attitude	-.086	.210	-.065	.684
Overall Language Confidence	.612	.221	.451	.009

Welsh Vocabulary X Language Use, Attitude and Confidence

L1 Welsh

Three IV's were significantly correlated with the participants overall Welsh vocabulary, suggesting a significant relationship between their overall UoW [$p=.030$], WwF [$p=.017$], and Confidence [$p=.000$]. Attitude was not significant. The multiple regression was also significant [$F(73,4)=3.592, p=.010$] with the variables accounting for 17.2% of the variance in the scores [$R^2=.172$]. However, the only factor to significantly influence the scores was the participants' Confidence (see table 6.12).

Table 6.12: Results of regression analysis for the L1 Welsh bilinguals' Welsh Vocabulary

Factor	Unstandardized Coefficients		Standardized Coefficients	Sig.
	B	SE	β	
(constant)	10.776	19.225		.577
Overall Use of Welsh	.057	.265	.039	.829
Use of Welsh with Friends	.065	.182	.069	.723
Overall Language Attitude	-.130	.125	-.123	.303
Overall Language Confidence	.621	.208	.381	.004

2L1

No significant correlations were found between the four IVs and participants' overall Welsh vocabulary. The multiple regression was also insignificant [$p=.404$; $R^2=.138$], suggesting that the four IVs were not significant predictors of the participants scores.

L2 Welsh

As with the 2L1 bilinguals, the four IVs were not significantly correlated with the participants overall Welsh vocabulary, suggesting that no significant relationship between the four IVs and participants' higher vocabulary scores. The multiple regression was also insignificant [$p=.165$, $R^2=.241$], suggesting that the four IVs were not significant predictors of the participants scores.

Attitude X Use of Welsh and Language Confidence X Use of Welsh

In order to establish whether Attitude and Language Confidence predicted the frequency of use of Welsh, a simple linear regression was conducted. A significant correlation was found between Attitude and Use of Welsh for both the L1W [$r(92)=.240$, $p=.011$] and for the L2W [$r(41)=.329$, $p=.018$]. A significant relationship was also found between Confidence and Use of Welsh [L1W: $r(92)=.435$, $p=.000$; L2W: $r(41)=.315$, $p=.022$]. This effect was not found for the 2L1 participants [Attitude: $p=.136$; Confidence: $p=.080$].

Results revealed for the L1W, Attitude was a significant predictor in participants Use of Welsh [$b=.173$, $p=.021$] and explained 5.7% of the variance [$F(1, 90)=5.487$, $p=.021$,

$R^2=.057$]. This was also found for the L2W participants, with Attitude found to be a significant predictor of language use [$b=.168, p=.036$] and explained 8.5% of the variance [$F(1, 39)=4.720, p=.036, R^2=.085$].

Similar results were also found for Confidence, with Language Confidence found to be a significant predictor for Use of Welsh in L1W participants [$b=.451, p=.000$] explaining 19% of the variance [$F(1, 90)=21.059, p=.000, R^2=.190$]. This effect also found for the L2W participants, with Confidence being a significant predictor in language use [$b=.164, p=.045$] and accounted for 9.9% of the variance [$F(1, 39)=4.303, p=.045, R^2=.099$]. However, these results were not found for the 2L1 participants [Attitude: $p=.272$; Confidence: $p=.160$]. This is likely due to those from 2L1 backgrounds harbouring more neutral attitudes and self-ratings of confidence since they live in more bilingual contexts.

Summary

In line with previous research (see earlier in the chapter), analysis (1-3) revealed that generally, children in the study held positive attitudes towards the Welsh language, albeit not as strongly as predicted. This was also true for measures of language confidence, with only some items correlating with participants' test scores. However, it was important to establish the impact these factors had directly on the participants scores overall. While the regression analysis did reveal that most factors were indeed correlated with the test scores to some degree or another (see Appendix C for graphs), only Language Confidence significantly had impact and predicted higher scores on the test. This indicates that while use of Welsh and attitude are important factors to consider, they may not necessarily lead to higher Welsh language attainment on measures of morphology and vocabulary. However, if a child possesses stronger language confidence, then it is possible that they continue to use Welsh, possibly in more advanced situations.

6.8.5 Analysis 5: Language of Media X Test Scores

The data were explored further to establish whether engagement with Welsh language media had an effect on participants' performance on the tests. However, it was notable that the L2 Welsh bilinguals did not report any engagement with Welsh media, and only one participant reported listening to music and watching television in both Welsh and English. This was a similar situation for the 2L1 bilinguals, with only one participant mentioning solely reading in Welsh, while nine reported listening to both Welsh and English music, six for television. Therefore, it was clear that English is the desired medium (see table 6.13).

This was a contrast to the L1 Welsh bilinguals, where most of the participants reported using both, in comparison to solely English or Welsh. However, more reported listening and watching solely English music and television in comparison to that of only Welsh within this group, which strongly suggests a preference towards English language media. However, for reading, it was notable that some 2L1 and L2 Welsh bilinguals reported reading in both languages, most likely due to the influence of education. Due to the variable responses received among 2L1 and L2 participant, a One Way ANOVA was conducted on the L1 Welsh cohort only. The IV was media language (Welsh, Both, or English) and the DV were the participants' test scores.

Table 6.13: Number of participants from each bilingual group and the languages they engaged in media.

	L1 Welsh			2L1			L2 Welsh		
	Welsh	Both	English	Welsh	Both	English	Welsh	Both	English
Music	12	44	33	0	9	28	0	1	38
Television	11	48	29	0	6	32	0	1	36
Reading	13	46	26	1	16	19	0	11	27

Music

Analysis revealed that there was a significant effect of language on the participants' plural morphology scores [$F(2, 83)=4.962, p=.009$] but not for Welsh vocabulary [$p=.109$] or

gender morphology [$p=.176$]. Interestingly also, those who listened to more English language music did not have significantly higher English vocabulary [$p=.196$]. Results of the post hoc revealed this to be due to the participants who reported listening to both English and Welsh music having significantly higher plural scores in comparison to those who listened to English media only [$p=.009$].

Television

Results revealed for all Welsh medium test, those who reported watching both English and Welsh television had higher test scores. Interestingly, for Welsh vocabulary those who reported watching only Welsh language television had lower Welsh vocabulary scores than those who reported watching English only television. They also performed on par with the English only group on measures of plural morphology (see figure 6.4). Unlike music, those who reported only watching English language television did have higher English vocabulary in comparison to the other two groups. However, results of the One Way ANOVA revealed that these differences were not significant (Welsh vocabulary [$p=.750$]; English vocabulary [$p=.969$]; gender morphology [$p=.259$]; or plural morphology [$p=.129$]).

Reading

Results revealed those who read mostly in Welsh had higher English vocabulary and morphology scores and in comparison to those reporting reading only in English and those who read only in Welsh (see figure 6.3), however, it was insignificant (Gender [$p=.058$]; Plural [$p=.683$]; English [$p=.861$]). On the other hand, those who reported only reading in Welsh performed marginally worse in their Welsh vocabulary knowledge in comparison to those who read in both languages and those who read in English only, but as with the other test, it was insignificant [$p=.967$].

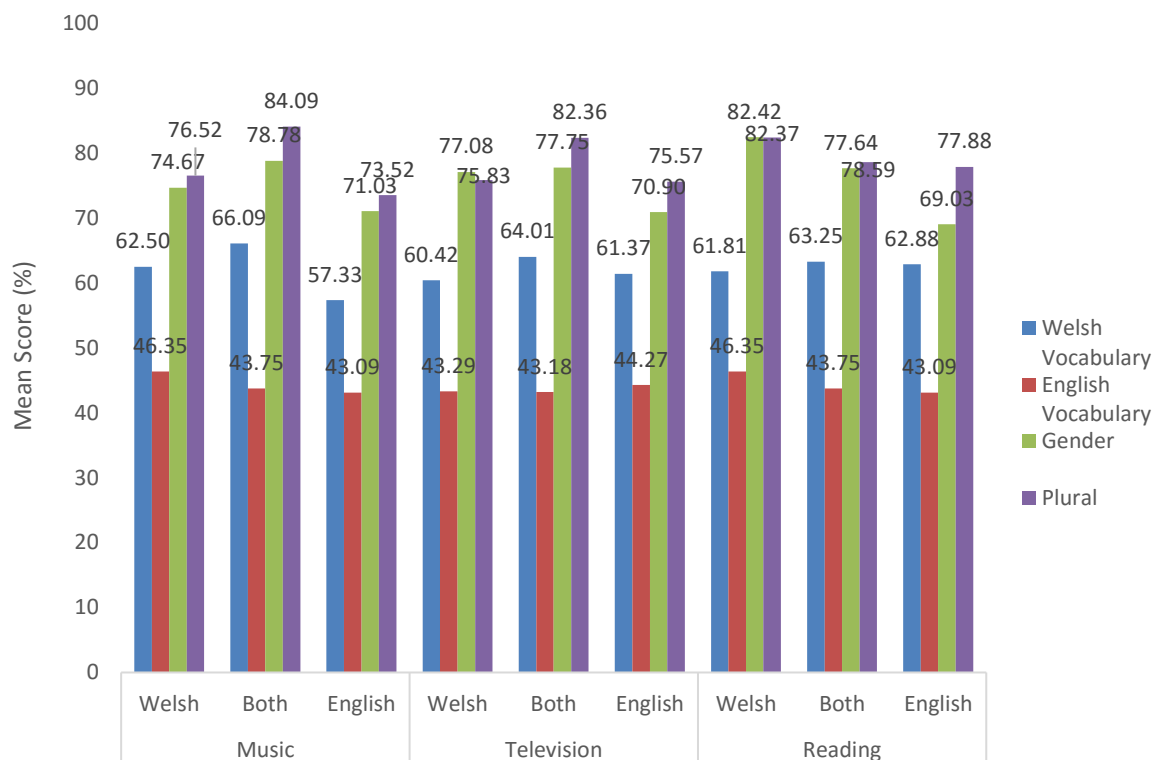


Figure 6.3: Performances L1 Welsh bilinguals on language tests depending on media language.

Summary

Even within the L1 Welsh bilingual group, more teenagers reported using only English medium media over Welsh only. For the L1 Welsh bilinguals, engaging in Welsh language media did not significantly affect their test scores, bar music for plural morphology. While this was a very small analysis, it does raise the need for further research in this area. The next chapter will go on to draw together the issues raised throughout this thesis, discuss the findings and present any implications they might have on the Welsh language.

Chapter 7: General Discussion

The main aim of this thesis was to explore the extent to which bilinguals with less optimal exposure to Welsh ‘catch-up’ with children of the same age receiving greater frequency of exposure to the language. While a number of past researches suggest an eventual convergence in linguistic attainment across speakers receiving various degrees of exposure over time (see Chapter 2), these studies tended to *predict* a convergence, but not many actively researched it (e.g. Oller & Eilers, 2002; Gathercole & Thomas, 2009). While recent investigations by researchers such as Paradis and Jia (2016) and Paradis et al (2016) have made further strides in this regard, their research has focused on the convergence of bilinguals’ performance with monolingual norms. Furthermore, as research within this field tends to focus on bilinguals acquiring dominant languages, such as English, within a mostly monolingual (language dominant) community, research on convergence in a minority language is limited. Therefore, the studies presented in this thesis aimed to contribute to this gap in our understanding of the contributing factors that may influence speakers’ ultimate linguistic achievements and their likelihood to converge with other types of bilinguals in terms of their knowledge of various aspects of a minority language, in this case –Welsh.

Chapters 3-5 aimed to assess whether or not an increase in exposure to Welsh through continued Welsh-medium education would lead to 2L1 and L2 Welsh-speaking bilinguals’ performance converging towards the same attainment levels as their L1 Welsh peers on measures of vocabulary knowledge (Chapter 5), and Welsh morphology (Chapter 3 & 4). Chapters 3 and 4 also assessed whether consistency of marking in the input provided by adult speakers influenced possible ‘catch-up’ through exploring teenagers’ performance on measures of an inconsistently-marked grammatical structure (grammatical gender) and a consistently-marked structure (plural morphology). Chapter 6 aimed to expand on the previous chapters’ findings by exploring the relationship between social factors and overall

language attainment, taking factors such as attitude, use of Welsh, and language confidence into account. This thesis provides a novel, more holistic approach to the study of bilingual development, exploring factors that are rarely combined when assessing children's overall ultimate attainment of language.

Together, data from the chapters presented in this thesis provide interesting findings in relation to each of the questions posed. This chapter will go on to consider the findings from each of the studies with a view to providing a more holistic understanding of how, and to what extent, different factors work together to influence a 'bilingual catch-up' and the ultimate attainment levels achieved by different types of bilinguals. This chapter will go on to highlight any potential implications of the findings, before going on to discuss the strengths and limitations of the studies and outline any future research.

7.1 *Overview of Main Findings*

The study aimed to address the extent to which teenagers from different language backgrounds converged on a common outcome with regards to language skills, and what factors (linguistic and non-linguistic) seemed to influence development. The main findings revealed a complex picture concerning the presence, or not, of a bilingual catch-up. In general, the results revealed a certain degree of 'catch-up' for some bilingual groups, which does provide some support for the hypotheses that, under favourable input conditions, catch-up can occur; however, this was not always the case (see Table 7.1 for an overview of the findings across all studies). These patterns were not the same across all structures, which are discussed in turn below. Separate discussions of each study are then followed by a discussion of the role of age of onset, uniformity of the input, cognitive limitations, the possibility for incomplete acquisition, the use of Welsh and attitudes towards Welsh and bilingualism on attainment.

Table 7.1: Overview of main findings for Studies 1-3. Mean percentage scores per study

Study	L1 Welsh			2L1			L2 Welsh			Long term Catch-up?
	12-13	16-17	Adult	12-13	16-17	Adult	12-13	16-17	Adult	
Gender	72.11	76.74	85.23	62.96	67.31	77.41	63.61	60.90	85.0	L1W & 2L1; 2L1 & L2W
Plural	70.47	85.6	90.56	63.54	73.74	92.13	57.02	50.17	83.68	No
Welsh Vocab	60.03	59.09	-	65.00	54.69	-	59.80	48.34	-	L1W & 2L1
English Vocab	46.37	48.1	-	48.13	49.24	-	56.13	49.53	-	Yes

7.1.1 Study 1: Grammatical Gender

The main aims of this study was to explore the role of continued exposure to Welsh on bilingual teenagers' acquisition and knowledge of Welsh grammatical gender to establish whether or not (i) there was a convergence in ability across bilingual groups, that is, whether 2L1 and L2 Welsh bilinguals 'catch-up' to L1 Welsh bilinguals in their ability to identify noun gender, and (ii) improvements were seen with age. This section will go on to discuss the results and implications of this study.

First, as predicted, there was no strong convergence in ability seen across language groups across-the-board. In fact, performance revealed a convergence between 2L1 and L1 Welsh bilinguals in general, but further inspection of the data revealed that this convergence was most likely to be due to performance among the 12-13 age group, particularly between the 2L1 and L1 Welsh children. For the older age group, on the other hand, performance differed across the language groups. On the whole, the L2 Welsh bilinguals did 'catch-up' to the 2L1 bilinguals – or, in other words, both groups performed similarly on the task – however only the 2L1 managed to reach statistically similar attainment levels as the L1 Welsh bilinguals, but only in the 12-13 group.

Second, the predicted improvements with age were not upheld. While the performance of the L1 Welsh and 2L1 did improve with age – that is, teenagers in the 16-17 group performed better than same language background children in the 12-13 age group, there were no significant improvements across both age groups for L2W children. That is, there were no significant differences between the scores of the L2W 12-13 bilinguals and the L2W 16-17 bilinguals, with marginally higher scores among the 12-13 group.

Whilst the general analysis did not reveal a significant interaction effect of language group and age, looking more closely at the data, the 2L1 16-17-year-olds [$M=67.31$] and L2W children [$M=60.90$] at age 16-17 were not performing any better than similar background children at age 12-13 [2L1: $M=62.96$; L2W: $M=63.61$]. However, the degree of difference between the 2L1 and L1 Welsh children at age 16-17 [mean difference=9.43%] was smaller than the difference between the L2W and L1W children [mean difference=15.84%] at age 16-17. This suggests that, in time, the 2L1 children may continue towards the L1 Welsh levels of performance, if their linguistic environments continue to provide suitable input.

These findings is in line with previous findings of gender in Welsh (e.g., Thomas & Gathercole, 2007; Gathercole & Thomas, 2009), which suggested that acquisition of the structure is a long, drawn-out process, partially due to the complexity of the structure and partially due to its status as a structure that is undergoing change. Under those conditions, it is not surprising to see that children, even at 16-17 years of age, are continuing to acquire the structure. The fact that none of the participants, even the L1W teenagers, performed the same as adults provides additional evidence to suggest continued acquisition across time. This lends strong support to Gathercole and Thomas, (2009)'s suggestion that grammatical gender is likely to be 'timed off the map' for acquisition for some speakers.

This declining trend across age groups among the L2W cohort is consistent with the findings of Thomas, Gathercole and Hughes (2014) for vocabulary, and is indicative, perhaps, of the influence of the lesser use of Welsh among peers as children become older and the tendency towards opting away from Welsh-medium provision at school. These concepts will be discussed further later on in this chapter. Even among L1W speakers at age 16-17, performance did not reach adult norms, with differences still existing between the adult control groups and the 16-17-year-old participants. Similar performance was reported by Paradis and Jia (2016), where plateauing occurred within Chinese L1 bilinguals on the more complex grammatical aspects of English even though they were still receiving education through the medium of that language.

Noun Animacy

In regards to performance on noun animacy, performance of all L1W, 2L1, and L2W bilingual participants across all age groups was stronger at identifying nouns for humans in comparison to nouns for inanimates, with performance on nouns for animals in the middle. This performance was unsurprising, and supported findings by Gathercole et al (2001) and Gathercole and Thomas, (2009), suggesting that the real-world sex of the referents of nouns for human are more salient to children when acquiring grammatical gender. In fact, older L1W bilinguals showed projection towards ceiling on nouns for humans, with 16-17 year old participants averaging over 90%. However, this was not the case for nouns for animals and nouns for inanimates, with the 16-17 year olds performing similarly on inanimates to the 12-13 [12-13: M=68.33%; 16-17: 68.57%]. Both the 2L1 and L2W bilinguals did not seem to show a clear progression towards L1W levels on either animacy type.

The success on nouns for humans in comparison to nouns for animals and inanimates might show a change in the system away from grammatical gender towards natural gender, which seems to support predictions made by Gathercole et al (2001). Gathercole, et al (2001)

put forward the suggestion that as English possesses natural gender it may explain the higher performance of L2W and 2L1 bilinguals on human nouns and their poor progression on animal and inanimate nouns. That being said, the success of the L1W bilinguals on animal nouns suggests that they do have knowledge of grammatical gender rather than showing a shift towards natural gender, as animals are not marked by their natural gender (see Chapter 5). Given L1W bilinguals have less interaction with English in comparison to the other two groups, this may explain why they have greater command of grammatical gender in comparison to L2W and 2L1 bilinguals who might show a projection towards natural gender. However, the lack of progression by L2W teenagers, and the slowed progression of 2L1 bilinguals, on human referents might suggest that this shift is more likely among such speakers.

Feminine vs. Masculine

Unexpectedly, the prediction that performance would be more consistent on masculine than feminine nouns was not upheld. Performance was higher on forms marked with *hi* + fem. and *ei* + fem, which contradicts Gathercole & Thomas (2009) and Thomas & Gathercole (2007) which have routinely found performance on masculine forms to be higher than on feminine forms. This is interesting for a number of reasons: First, there are fewer feminine than masculine nouns in Welsh, therefore it may be that children pay more attention to agreement patterns relating to feminine items. Second, as AM is associated almost exclusively with feminine *ei* and applies to fewer antecedent nouns than *ei* + SM does, this form may be more salient to children and therefore lead to more accurate responses. It could also be that *ei* + AM is more salient to children due to its ‘functional load’, as discussed earlier in Chapter 3. Third, since *ei* + SM is more frequent in the input and is often overextended to the feminine context, particularly for inanimate nouns, it may be the case that children were happy to select *ei* + SM as a marker for feminine nouns when the correct

response should have been as a marker for the masculine noun. The lack of catch-up in the gender data therefore does not indicate a general lack of attention/awareness of the structural properties of the system. Instead, it suggests that teenagers – even L2W bilinguals – are responding to some degree to the patterns of gender marking within the input.

Reasons for lack of ‘catch-up’

While the lack of ‘catch-up’ could be attributed to participant level factors such as the areas in which the participants were recruited from (a factor which will be discussed in more detail in further on in this chapter). The lack of significant progress seen within the L1 Welsh and 2L1 bilinguals, and the deteriorating performance of the L2 Welsh bilinguals, does strongly suggest that the continuous exposure children receive from Welsh-medium education, and from their overall environment, does not result in convergence of the three bilingual groups in their knowledge of grammatical gender. However, to pin point the exact reason for a lack of grammatical gender ‘catch-up’ is not straightforward for a number of reasons, as outlined below.

First, the task required participants to read the sentences. However, since Welsh is a phonemic language with a transparent orthography, learning to read in Welsh is not difficult (Ellis & Hopper, 2001; Spencer & Hanley 2003), and would not necessarily have disadvantaged L2 speakers. In addition, exposure to Welsh for L2 participants occurs mainly at school where there is great focus on literacy.

Second, the convergence seen across language groups in the 12-13 cohort and the subsequent loss of convergence within the 16-17 age group could simply be due to sampling issues. Given this was not a longitudinal study it is impossible to say how the current 12-13 cohort would perform at 16-17. Further studies need to look at the developmental pattern within the same individuals. Due to time constraints, this was impossible to do in the present study.

Third, children are acquiring a system that may be undergoing structural change. Teenagers in this study were unable draw on the links between the cues and noun gender, which support the notion presented in Thomas and Gathercole (2007) that “*there is no systematic rule-based understanding of the system*” (p.270). This suggests instead that grammatical gender and mutation is acquired ‘item-by-item’ or ‘context-by-context’ rather than via the extraction of the rule from a sound underlying network of concurrences. The fact that teenagers performed better on nouns for humans, which have additional real-world gender cues, with no clear improvement across age and language groups in relation to performance on nouns for animals or inanimates suggests that the system may eventually be reduced to a semantic rather than a grammatical gender system.

Lastly, an alternative account could be that children were not paying too much attention to the grammatical properties of the sentences when choosing the pictures, but, instead, responded according to the saliency of the pictures themselves. That is, it could well be that the broken leg on the picture of a chair was more salient than a picture of a broken leg of a table, forcing the child’s choice towards the pictorial representation of the chair, regardless of the grammaticality of the sentence heard.

Whilst all these accounts are possible, the patterns identified within the results are interesting and suggest that a number of factors such as frequency of exposure, the complex form-function mappings within the system and variation in the input, (highlighted earlier in Chapter 5), influence the stability of the system and together have an effect on the overall outcomes of all individual participants’ ability to converge and/or improve with age.

7.1.2 Study 2: Plural Morphology

As with grammatical gender, the aims of this study was to explore the role of continued exposure to Welsh on bilingual teenagers’ acquisition of the Welsh plural system. The main aims were to establish whether or not (i) there was a convergence in ability across

bilingual groups, that is whether 2L1 and L2 Welsh bilinguals ‘catch-up’ to L1 Welsh bilinguals on measures of plural morphology, and (ii) whether there were improvements seen with age. This section will go on to discuss the results and implications of this study.

Uniformity of the input

As confirmed by Thomas et al. (2014), adults use target-like marking of plural forms in spontaneous speech. The adults in this study also displayed good performance of the plural marking, with performance of the L1 Welsh adults at averaging around 90%; 2L1 bilinguals 92% and L2 Welsh bilinguals 88% which suggests that the exposure children have to these forms in adult speech, at least, is, on a whole, considered consistent which, in turn, could facilitate the teenagers’ acquisition of those forms.

The results demonstrate a clear relationship between overall home language exposure and grammatical competence. These findings support previous research conducted with younger children for both plural morphology (Thomas, et al. 2014), and grammatical gender (Gathercole & Thomas, 2009). However, the prediction that continuous exposure to Welsh over time will lead to a convergence across bilingual groups, on a whole, was not upheld. Given that performance on plural morphology followed a similar pattern to that on the grammatical gender task, an inconsistent system, the lack of convergence of plural morphology suggests that uniformity in the marking does not aid ‘catch-up’ in this instance. However, the role of input quality must not be dismissed entirely. It is important to consider that similarities in the patterns of results on the grammatical gender and plural tests could be due to the nature of the test items, rather than input properties. The productive nature of the plural test meant that only one answer would be counted as correct, but participants could produce one of a number of possible responses (see Chapter 4 for overview of plural marking in Welsh). In comparison, the grammatical gender test asks participants to decide between

two picture items thus, there would be an element of chance. Therefore, in a gender production task it is easier to gain a score of 50% on a given item than on the plural test.

Conversely, the L2 Welsh bilinguals did not ‘catch-up’ to the 2L1 bilinguals on the plural task – with performance still lagging behind. Within the younger age group, performance was only just insignificant, with the L1 Welsh bilinguals significantly outperforming the L2 Welsh. There was no significant difference between the L1 Welsh and the 2L1 bilinguals suggesting at ages 12-13, the 2L1 bilinguals have converged to the levels of L1 Welsh bilinguals. There were also no significant differences between the 2L1 and L2 Welsh bilinguals. Therefore, within the 12-13-year-old participants it appears that there is evidence of ‘catch-up’, with only the L2 Welsh bilinguals yet to reach L1 Welsh levels. However, as with the performance on the gender task, although this was not a longitudinal measure of performance across age, whatever ‘catch-up’ existed within the younger participants was not evident within the 16-17 group, with the L1 Welsh bilinguals outperforming both the 2L1 and L2 Welsh bilinguals and the 2L1 outperforming the L2 Welsh bilinguals. Whatever accounted for the ‘catch-up’ among the 12- to 13-year-olds was not present in the same way among the older teenagers.

In terms of age, it was predicted that the older bilingual group would perform better than the younger age group on the test items. This was largely upheld – particularly in relation to the results of the L1W and 2L1 bilinguals. For the L1 Welsh bilingual group, by age 16-17 performances were at adult level, with no significant differences between the 16-17 group and the adult control of that bilingual group. Similarly, a significant increase was seen within the 2L1 group, albeit to a lesser extent than in the L1 Welsh group. Conversely, the 16-17 L2 Welsh group performed (albeit, insignificantly) worse in comparison to those at age 12-13 – following a similar performance pattern as the grammatical gender. While older L1 participants are therefore likely to eventually reach adult levels, the 2L1 and L2 Welsh

bilinguals are much less likely to do so. The fact that 2L1 children who are exposed to Welsh from birth do not reach adult norm by age 17 does suggest that an early AoO does not necessarily guarantee full acquisition of the plural system. Therefore, it is suggested from these results that any long-term convergence through input alone occurs beyond the age 17. That said, the fact that the 2L1 and L2 Welsh adult participants were performing at a comparable level to the L1 Welsh adults implies that convergence can eventually occur during adulthood. The convergence within the adult control group did not replicate the findings of the Thomas et al. (2014) study, which found no convergence across their adult control group. Therefore, given the relatively small sample size of the 2L1 and L2 Welsh bilingual within both papers, whether or not there is truly a convergence within adults is unclear – a discussion that will be continued within this chapter.

On one hand, the lack of catch-up could be characteristic of incomplete acquisition and/or attrition. For the 2L1 bilinguals particularly, the lack of significant difference between older and younger 2L1 bilinguals could either be characteristic as simply a slower rate of acquisition in comparison to the L1 Welsh bilinguals. On the other hand, it could represent a slowing in the rate of acquisition, culminating in possible incomplete acquisition or attrition. Montrul (2008) suggests that if the L1 has not been acquired when the L2 is introduced then “*the minority language can lag behind and develop incompletely*” (p.131). Whether or not these results are characteristic of incomplete acquisition, attrition, or are caused by plateauing in acquisition are difficult factors to untangle. However, it is clear that the variation in performance in this study is linked to the overall Welsh input the participants have received over their lifetime. In the case of 2L1 and L2 Welsh bilinguals, it is clear that the input they have received in their lifetime is not optimum for full development and sustainment of the plural system (Montrul, 2008).

Transparency of Structure

On the whole, participants did not struggle more with the more opaque plurals that include an internal vowel change. Rather, it appears that performance was higher for certain opaque forms in comparison to those that only required a more overt structural change, such as forms that include a suffix alternation. That being said, this was not universal – with performance of the L2 Welsh bilinguals low on those requiring only vowel changes, and vowel change and suffix addition/alternation.

Nevertheless, in line with previous research on studies looking at opacity of the structure and input (e.g. Paradis, 2010; Unsworth, 2013), predictably there was a link between home language and performance across all plural types, with the L1 Welsh bilinguals outperforming 2L1 bilinguals who outperformed the L2 Welsh bilinguals. However, performance of the 2L1 bilinguals was higher than L1 levels on suppletive forms, and also close on forms requiring a suffix deletion (with and without vowel change), and vowel change only. In fact, performance on forms that included suffix deletion, with or without an internal vowel change was universally high, with all three bilingual groups performing over 80% on these forms. This was also true for suppletive items, with even the L2 Welsh bilinguals performing at 84.14%. It can be concluded that participants are aware of, and are able to form plurals that constitute closed classes of items such as the suppletives, and those including vowel changes. Given that certain types of plural forms are smaller in number – such as the suppletive, and mass-count nouns (-suff, -suff+V) the performance is in line with what was predicted. Therefore, the higher performance on these forms are suggestive that children learn these forms item-by-item, rather than through extracting regularities from the input.

The prediction that improvements would be seen with age was mostly upheld. Progression was also seen with age for both the L1 Welsh and 2L1 bilinguals with the older

teenagers outperforming the younger teenagers. However, this was not the case for the L2 Welsh with performance deteriorating between ages 12-13 to 16-17 on all forms bar +suff+V and –suff items. Within the L1 bilingual group, performance of both the younger and older teenagers on the suppletive forms was in fact higher than the adult control group, suggesting that these forms are fully acquired fairly early in comparison to others. Unexpectedly, this was also found in the L2 Welsh bilinguals, with the younger participants outperforming the adult control and older teenagers. However, while this effect was possibly due to sampling, it may also be due the 12-13-year-old participants actively engaging with Welsh medium education at that time, a discussion that will be expanded upon further in this chapter.

Considered together, this study suggests that on the whole 2L1 and L2 Welsh bilinguals are still in the process of acquiring a full morphological paradigm at age 16. Acquiring the easier more transparent forms comes first, such as the +suff, which may be used as the default strategy. However, opaque forms which require subtle sound changes might take longer to be mapped onto the system once the individual receives enough exposure, with the L1 Welsh bilinguals displaying a fuller model at 16, with the 2L1 following suite albeit at a slower rate. However, the results of this study indicate that the L2 bilinguals are floundering in their acquisition of the system - even with continued input through education. This result clearly supports the suggestion presented by Carroll (2017) who indicated that there are factors beyond input to be considered, a point that was covered in more detail in Chapter 6.

The poor performance on most transparent forms, such as +suff, is misleading, leading to suggestion that teenagers are slow to acquire this particular form. Given the high number of plurals that are formed using this method, it is likely that this is the form that is most salient to errors – such as adding an incorrect suffix. It is clear from the errors produced that teenagers are aware of +suff as a rule, as it accounted for the majority of

overgeneralisation errors across all bilingual groups [L1W: 65.57%; 2L1: 60.43%; L2W: 69.31%]. Therefore, it is clear that individuals are using this form as a default strategy to apply onto unfamiliar words. The high numbers of errors were most likely due to the high number of plausible suffixes available within the Welsh language, with participants selecting the incorrect suffix rather than the incorrect plural type. This is supported by the overextension of the *-(i)au* suffix – the most common plural suffix, which accounted for over 64.96% of all errors across the three bilingual groups.

The prediction that the overextension of the suffix *-(i)au* would reduce with more exposure was not upheld, conversely the overextension increased, a stark contrast to that seen within the children in Thomas et al. (2014) study – in which *-(i)au* errors accounted from 25.84% in L1 Welsh bilinguals to 55.57% in L2 Welsh bilinguals. Combined, this does suggest that the single *+(i)au* becomes the default strategy for all individuals across all bilingual groups. The overgeneralisation and extension of both the *+suff* forms and the *+(i)au* suffix clearly demonstrates the link between exposure and acquisition of the plural system, suggesting that the participants clearly have identified these as the most commonly found the input, thus displaying some knowledge of the grammatical properties of the system. This lends support to previous research such as Paradis and Navarro (2003), which assessed the role of frequency patterns on children's acquisition.

On the other hand, the overregulation of the most common form, still present in the errors performed by the older group, could also indicate a possible shift towards a simpler system, particularly in the case of L2 Welsh bilinguals, which would be linked to its similarity to the simpler *+suff* pattern found in the English plural system. However, whether or not this is the case is beyond the scope of this thesis. While other suffixes were overextended, the high use of Welsh plural suffixes within the errors, such as *-(i)au* and the low percentage of errors involving the English *-s*, particularly for L2 Welsh teenagers,

followed the error trend found within the children in Thomas et al's study. The use of the English –s was in fact highest in 2L1 bilinguals followed by the L1 Welsh bilinguals, suggesting there may be something specific relating the experiences of 2L1 bilinguals – e.g., they may be more likely to hear the use of Welsh and English intertwined within their immediate home environments (i.e. they may be more likely to be exposed to code-switching practices), which may account for this. L2 Welsh on the other hand, would be less exposed to code-switching of this kind in their home environment in particular, leading to what Thomas et al. (2014) refers to as a “*heightened awareness of the differences between the two languages*” (p.491). This supports previous accounts by researchers such as Nicoladis (2006) who suggest that bilinguals have a level of syntactic awareness and are able to distinguish between their two languages while acquiring the morphological systems of said languages. However, the results of the present study suggests that some types of bilinguals may achieve this more than others.

7.1.3 Study 3: Vocabulary

In contrast to gender and plural marking, the results of the vocabulary tests revealed that there was a general ‘catch-up’ found across language groups on these measures. Among the younger bilinguals on the Welsh vocabulary test, both the 2L1 and L2W bilinguals converged with the ability of the L1W bilinguals, as seen also for Grammatical Gender in Chapter 3. However, as with Grammatical Gender, this effect was lost within the older bilinguals. While initial analysis revealed no main effects of Bilingual Group among the older cohort, further analysis revealed that the L2W bilinguals were not performing at comparable levels to L1W bilinguals, with only the 2L1 bilinguals continuing to perform at comparable levels to their L1W peers. But what are the possible implications of this result.

First, it is worth addressing that any results could be influenced (and any success exaggerated) by the small sample size within the younger age group, and the limited number

of participants within some bilingual groups, therefore any wide generalisations of these data must be taken with this in mind. This applies also to the location of the sample. Given that the data were collected from two of the Welsh ‘heartlands’ the performance on the Welsh vocabulary test may be stronger here in comparison to how it could appear in more Anglicised areas of Wales. Further discussion of limitations will be presented later in this chapter.

Second, as discussed in Chapter 2, vocabulary is acquired ‘item-by-item’; therefore, it is likely that success on this particular test will be highly contingent on their overall exposure to Welsh across different domains. As the L2W bilinguals acquire Welsh largely within the school context, they will most likely have domain specific vocabularies. If this is the case, the nature of the test items (non-school-based vocabulary) may have had an influence on their performance.

Third, as vocabulary acquisition is also linked to reading abilities it may be that L1W and 2L1 bilinguals read, or have more exposure to, written materials in Welsh. These two groups may also feel more confident in their Welsh ability, and may read more challenging materials in Welsh – thus acquiring more sophisticated vocabulary and overcoming any domain-specific issues related to vocabulary acquisition (see Chapter 6, for analysis of language confidence in relation to vocabulary).

The lack of catch-up of the L2W bilinguals’ Welsh vocabulary scores may also be linked to an increase in the opportunities to study in English. Children who opt to study some subjects in English will not be receiving exposure to more specialised, or advanced, vocabulary that may have been in this particular test. It is also possible that between 12-13 and 16-17, use of English increases within friendship groups. Using the *Prawf Geirfa Cymraeg* (Welsh Vocabulary Test), Thomas, Gathercole, and Hughes’ (2014) assessment of receptive vocabulary within 11-15 year olds discovered similar results. Coupled with an

increase in English within friendship groups, they found that the older participants within the study began to plateau in their Welsh vocabulary knowledge.

Fourth, analysis of the English vocabulary tests revealed no main effect of Bilingual Group. However, surprisingly, results of the paired samples *t*-test did reveal a difference in test language. The L1W and 2L1 bilinguals continued to be significantly stronger on Welsh vocabulary [mean difference: L1W=10.99%; 2L1=5.45%], while the L2W bilinguals performed comparably on the English and Welsh tests. This trend continued from age 12-13 to 16-17. This result seems to contradict the ‘popular’ belief that minority L1 children will easily acquire the dominant language from their environment. It also contradicts studies such as Gathercole and Thomas (2009), which found that English language differences disappear early on in childhood. However, Rhys and Thomas (2013) using the BPVS (British Picture Vocabulary Scale) discovered similar findings that suggested L1 Welsh children were lagging behind their L2 Welsh peers on measures of English vocabulary.

However, given the ‘item-by-item’ nature of vocabulary acquisition, items within the test were possibly beyond L2 school-based transmission. That being said, exposure to different sources of English vocabulary is much easier to come by within the general environment in comparison to Welsh. This raises the question as to whether L1W, and to a lesser extent Welsh dominant 2L1 bilinguals, are actively engaging with English outside the classroom – a concern often heard in regards to L2W bilinguals and Welsh. Given the locations of the sample within the study, it is plausible to assume that at least some students’ use of English outside of ‘English as a subject’ is minimal – in the same way as L2W view ‘Welsh as a subject’. It would be interesting to replicate this study in a more Anglicised area of Wales where English is more prominent to establish whether there would be differences between the two samples. However, as with Welsh vocabulary within the L2W bilinguals, the likelihood of lack of reading within teenagers may also be a sound explanation for any

perceived English vocabulary deficits within the L1W and 2L1 participants. Lack of English reading (and Welsh for the L2W) within these groups could affect their vocabulary acquisition, especially if the L1W bilinguals fail to engage with English outside of the classroom.

However, while the above factors do play a large part in their success in acquiring both Welsh and English vocabulary, it is also worth noting particular differences with the tests themselves could have influenced the overall scores to some degree. While both are standardised tests, given to educators to assess the development of their students, they are not the same. The English vocabulary test was monolingual normed, while the Welsh bilingual normed. Overwhelming amounts of research has found that bilinguals generally have smaller vocabularies in comparison to monolinguals (see Chapter 2), and have domain specific vocabularies (Oller, 2005). Therefore, the test itself may have been harder for a bilingual participant in comparison to a monolingual. The nature of the English language itself, in comparison to Welsh, has a larger range of synonyms which children could be exposed to. This lends itself to create what could be considered a harder test. Welsh in comparison, does not have such a range in vocabulary items. Therefore, particularly for an L1W bilingual, it may have been easier to deduce the answers within the Welsh tests in comparison to the English.

Nevertheless, the result does raise the question whether knowledge of English is being hampered by the lack of English input in Welsh-medium/bilingual schools and in the L1 Welsh teenagers' environments. One implication of this finding is that schools and LEAs should identify their learners' linguistic needs better in order to ensure children are developing both languages to their full potential. In some cases, that will mean that children who are exposed primarily to Welsh and have sound command of that language may require enhancement of their English vocabulary in the same way as L2W bilinguals require

enhancement of their Welsh vocabulary those efforts should be made to ensure children are achieving the appropriate levels for that language.

7.2 *Role of additional factors*

This section of the general discussion will go on to discuss the findings of the three experimental chapters together in relation to broader factors, such as AoO, input quality, and cognitive factors that could have influenced participants' attainment patterns.

7.2.1 *Age of Onset*

As mentioned in Chapter 2, early language experiences can contribute greatly to children's expected language growth and outcomes, for monolingual and bilingual children (Hoff, 2003; Gathercole, Sebastián & Soto, 1999). The lack of convergence between the 2L1 and L1W bilingual teenagers was particularly surprising given Montrul (2008) stance that AoO is often the strongest predictor of native-like ultimate attainment of language. Similarly, Cook (1992) suggests that morphosyntax is less constrained by a later AoO in comparison to other aspects of language such as phonology. Others have suggested native-like convergence happens 4-6 years after AoO (Jia and Fuse, 2007; Marinis & Chondrogianni, 2010).

Although AoO was not used as a variable in the current study, the length of exposure to Welsh and their current attainment levels suggests that, contrary to the aforementioned studies, an early AoO does not guarantee native-like attainment of Welsh. L1W and 2L1 bilinguals would have had exposure to Welsh from birth, albeit in different quantities. AoO for L2W bilinguals would generally be later, around four years old when they began Welsh medium schooling – which is considered by many to be within the critical period window (Birdsong & Vanhove, 2016). Thus, L1W and 2L1 bilinguals' onset of Welsh acquisition in the 16-17 age group would span 16/17 years, 12/13 years for L2W. Yet, while they did for gender, the 2L1 bilinguals failed to converge to the same level as L1W bilinguals on

measures of plural morphology and L2W bilinguals failed to converge to the L1W bilinguals on any morphological measures even with this length of exposure to Welsh.

The failure of these students to converge with one another on test outcomes suggests that the overall quantity of exposure has a continuous effect even in situations where there is a similar (and in our case, lengthy) exposure to AoO. This finding seems to contradict Unsworth (2016) who discovered that children with different AoO showed no significant differences on measures of Dutch morphology and morphosyntax. Unsworth also states that while there were no age effects, there were input effects, with differences influenced by the quantity and quality of input. In comparison, Rodina and Westergaard (2017) comparing children with two Russian-speaking parents to those with only one, similar to the findings of this thesis, found no morphological attainment convergence in Norwegian-Russian bilingual children aged 4-11 learning Russian as a heritage language. They suggest that the overall quantity of exposure has a continuous effect even in situations where there is a similar (and lengthy) AoO. Given that Unsworth (2016) assessed children acquiring the dominant community language, the difference between her findings and those of the current study suggests that AoO may be a poor marker for attainment success in minority language contexts.

The actual length of exposure needed for convergence to occur is not easy to measure. Flores, Santos, Jesus, and Marques (2016) found that for those with less parental exposure, it would take 12-13 years to converge, whereas for those with more exposure it would take 8-9 years to converge with monolingual attainment levels. Other studies have suggested that it takes between 4-6 years for ‘catch-up’ to occur (Hakuta et al., 2000; Saunders & O’Brien, 2006). The results of Chapters 3-4 suggest that these timeframes are insignificant in the acquisition of complex Welsh morphology and that in the context of this study it is reasonable to assume that early AoO does not necessarily result in full Welsh grammatical

attainment, by age 17, and that continued progression is likely for L1W and 2L1 bilinguals but less likely for L2W bilinguals.

7.2.2 *Uniformity of the Input*

In Chapter 2, the importance of input quality was stressed as a factor in children's success in acquiring different grammatical structures. Factors such as language 'richness' and the consistency with which the target grammar is marked have been found to influence attainment outcomes in bilinguals (Unsworth, 2008, 2012; Sorace, 2014). Therefore, due to the effect of qualitative factors, the failure of the 2L1 and L2 Welsh to progress on measures of plural morphology in comparison to grammatical gender was a contrast to the predicted hypothesis. Out of the two systems, adults are expected use plural morphology consistently (Thomas, et al 2014); thus, 'catch-up' was more likely expected for plural morphology.

However, this was not the case. While, this result may be distorted due to the grammatical gender test being a receptive test while the plural morphology was productive, it raises the question to what extent even a consistently marked structure can be fully acquired by an L2 speaker if the structure itself does not have clear form function-mappings. These results support arguments by Thomas et al. (2014) and Gathercole and Thomas (2005) that opaque form-function mappings result in a piecemeal approach to morphology acquisition, in line with other constructivist theories (e.g Tomasello, 2003; Ambridge & Lieven, 2001). However, if an 'item-by-item' approach is assumed, the relative complexity of form-function mapping, coupled with Welsh's minority language status will affect the pace and trajectory of acquisition. Therefore, if a 'catch-up' is to occur on any of these structures it may take longer, and possibly post age 17.

7.2.3 *Cognitive Limitations*

While this study did not take into account cognitive performance, there is a possibility that child-internal cognitive factors may be a significant predictor of linguistic success.

Paradis (2011), Paradis et al., (2016), and Farnia and Geva (2011) all found links between language ability and verbal short-term memory, with verbal short-term memory being the largest predictor of children's vocabulary and grammar accuracy in some studies, and a superior verbal short-term memory consistent with greater verb morphology accuracy in others (Paradis et al., 2016). However, Farina and Geva (2011) found that verbal short-term memory was more predictive in early bilingual development rather than later, with researchers like S.E Gathercole (2006) finding links between vocabulary and a development shift as children mature.

On the other hand, the failure to converge may be due to maturational changes. Ellis (2015) suggests that implicit language acquisition is an unconscious process that takes place naturally, while explicit learning is a more conscious process. Ellis has suggested that while young children generally acquire language implicitly, as they become older language acquisition becomes more explicit and more reliant on memory. Therefore, if structures have not been acquired prior to this shift, a failure to progress might be due to difficulties in retaining linguistic information rather than insufficient input. However, since measures of general cognitive abilities were not performed on this study, the influence of cognitive ability on L2 language success is an avenue for future research

7.2.4 *Incomplete Acquisition*

While it is fair to state that the lack of progression within L2W bilinguals may be due to certain limitations (see limitations section below), the results of this thesis strongly suggests there is a plateauing effect in place. For Welsh-English bilinguals, the lack of standardised linguistic outcomes for Welsh makes it difficult to establish whether students in the current sample are performing according to established norms. In the acquisition of monolingual English morphology, it has been found that linguistic growth reaches a plateau by age six, with accuracy reaching ceiling with little variation between individuals (Rice &

Wexler, 1996; Rice, Wexler, & Hersberger, 1998). Others have concluded that acquisition of L2 morphology is accelerated at first, but then plateau before reaching ceiling (Jia & Fuse, 2007). What is unclear in the current study is to what extent the plateauing seen in the performance of L2W bilinguals is adhering to their target developmental outcomes and whether that performance is ceiling performance for them.

Montrul (2008) suggests that the minority language is at greater risk of attrition and eventual incomplete acquisition in comparison to the dominant community language.

Children age 10 and under have been found to show a more rapid shift towards the majority L2 and a larger degree of L1 loss than older children. Taking Montrul's suggestion into account, as the 2L1 and L2W participants in these studies have always received exposure to the dominant language, the thesis' findings might possibly suggest that the performance pattern of the 2L1 bilinguals might be due to attrition of the minority language, while, for L2W bilinguals, performance may be more indicative of incomplete acquisition.

Both Gathercole (2002b) and Montrul and Potowski (2007) found acquisition of aspects of Spanish morphology was still vulnerable to incomplete acquisition, even with continued educational support for Spanish. Similarly, Paradis and Jia (2016) and Paradis et al. (2016) discovered that participants in their studies were plateauing on harder morphological structures, even with continuous education in that language. Given the opaqueness of Grammatical Gender and Plural morphology in Welsh, it might be expected that L2 speakers plateau on these structures, but might not on more transparent structure. Therefore, assessing progression of a less complex structure would be advantageous in establishing whether it is the complexity of grammatical forms that dictates whether there is a plateau, or is it simply a case of incomplete acquisition.

On the one hand, while attainment seems to improve with age (bar the L2 Welsh bilinguals) it is worth assessing whether these structures are fully acquired at age 16-17, or by

adulthood. If we use the more stringent criteria of 90% correct (Brown, 1973) it would seem as if these structures are not fully acquired at age 16-17, even by L1 Welsh speakers. In fact, the only groups who could claim to have fully acquired these structures would be the L1 Welsh and 2L1 adults but only for measures of Plural morphology. While researchers such as Jia and Fuse (2007) used a slightly less stringent threshold of 80% in their study, even with a less stringent threshold the only teenagers who pass this threshold are the older L1 Welsh and only for plural morphology. Grammatical Gender success on this threshold is limited to L1 Welsh and L2 Welsh adults. The notable thing about Grammatical Gender in particular, first, is that it has very little semantic importance in Welsh, that is, if the noun gender is incorrectly marked it does not alter the sentence meaning, excluding the possessive *ei*+AM. However, mutations that are even more prevalent are undergoing a structural change (Prys, 2016) in which speakers change sentence structure in order to avoid marking for gender. Second, in the face of linguistically structural changes, how can children be expected to fully acquire an ever-changing structure, and should success on such structures be the gold standard for Welsh language attainment - given the variation with use.

In terms of ‘ultimate language attainment’, as all groups failing to pass on the more stringent criterion and only L1 Welsh speakers passing for Plural morphology on the less stringent criterion, it raises the question at what point is the Welsh language fully acquired, and what does full acquisition mean. This is a different question to that posed in Montrul’s context. Montrul (2016) suggests for L1 speakers of a minority language, acquiring the L2 in school will still be a detriment to the development to the L1. Montrul goes on to state “*that achieving a relatively balanced bilingualism after age 4 is not possible*” (p.150), with the increase in use of the dominant L2 in school and with peers coming at the expense of the L1 which is not fully developed, resulting in the minority L1 never being fully acquired.

However, the difference with Montrul’s situation with the one in this thesis is that there is

institutional support for Welsh as a minority language in Wales; therefore, it does not make a clear comparison. That being said, the struggle of L1W bilinguals to reach proficiency thresholds does suggest for a minority language - acquired in communities where that language is supported – that the introduction of the dominant L2 might hamper the development of the minority L1, albeit to a lesser degree than to what Montrul (2016) states. On the other hand, the findings of this study to lend strong support to Montrul's claim against the notion that language acquisition is largely complete at age three or four.

7.3 *The Influence of Social Factors*

Incomplete acquisition may not be solely influenced by input properties. At older ages, psycho-social factors continue to influence children's use and engagement with the minority language, leading to increased usage of the dominant language, irrespective of educational support. The 'catch-up' generally seen within younger participants and the subsequent loss within older participants may be due to a pattern seen within 2L1 and L2W children who thrive at speaking and using Welsh in the primary sector but choose not to use it so much in the secondary sector, as found by Thomas, Gathercole & Hughes (2014). Similarly, Montrul (2008) suggests that language development becomes more individualised as children become older, influenced more by personal interests. Therefore, the clear preference seen for English language media by 2L1 and L2W bilinguals (see Chapter 6) might exacerbate this shift or preference to the dominant language: English. The next section will go on to discuss the findings of Chapter 6, which assessed the role of psycho-social factors on teenagers' acquisition of Welsh.

7.3.1 *Use of Welsh*

In terms of the participants' use of Welsh and use of Welsh with friends, results of Analysis 1 and 2 suggested even using Welsh over 80% of the time does not result in full acquisition of both plural, gender morphology nor Welsh vocabulary. The use of Welsh was

generally correlated with their overall scores on each test, but it was not universal across all bilingual groups, particularly for L2W bilinguals (see table 7.2 for overview of results).

However, while both variables were significantly correlated with the participants' test results more often than not, participants' use of Welsh never predicted success on any tests. This was surprising given the general association between higher uses of a language and stronger linguistic skills.

Nevertheless, given the importance placed on *quality* (Sorace, 2014), it is important to consider the possibilities that the participants may not be using Welsh in linguistically rich situations where they might receive enough exposure to a variety of standard forms. Also, although the medium of education is Welsh, children in secondary school will only spend a certain amount of their schooling in Welsh lessons, in which their written Welsh is guaranteed to be scrutinised. Even though the medium of other lessons most likely would be Welsh, it is reasonable that grammar might not be the focus with emphasis placed on academic content rather than grammar.

While, Thomas and Roberts (2011) noted that young L2W children tended to have stronger written, receptive skills and avoid oral production, it is possible that grammatical errors are not highlighted regularly which may result in children continuing to converse in Welsh, and possibly write in Welsh, with little attention given to how it is used. This is particularly important in the current study since all tasks were written rather than oral. As Welsh becomes an elective subject after age 16, L2W bilinguals may maintain stronger oral skills in comparison to their written skills – the skills measured in this thesis. Nevertheless, this is speculative, and further research would be needed to investigate further. However, it would be worth investigating whether the L2W teenagers' attainment of these structures is incongruent to that of their overall ability to speak Welsh.

Table 7.2: Overview of Regression and Correlation *p* values across each bilingual group to display significance. *denotes a significant predictive value

Bilingual Group	Variable	Gender		Plural		Welsh Vocab	
		Correlated	Predictive	Correlated	Predictive	Correlated	Predictive
L1 Welsh	Use of Welsh	.043	.859	.003	.333	.030	.829
	Welsh with Friends	.024	.755	.003	.948	.017	.723
	Attitude	.161	.829	.042	.493	.408	.303
	Confidence	.003	.043*	.001	.078	.000	.004*
2L1	Use of Welsh	.013	.531	.069	.419	.066	.536
	Welsh with Friends	.012	.275	.048	.496	.058	.791
	Attitude	.009	.150	.380	.458	.071	.443
	Confidence	.052	.546	.542	.006*	.094	.626
L2 Welsh	Use of Welsh	.116	.588	.026	.417	.331	.044
	Welsh with Friends	.146	.776	.026	.978	.162	.083
	Attitude	.069	.547	.162	.684	.210	.505
	Confidence	.025	.172	.001	.009*	.076	.379

7.3.2 Language Attitude

Participants' moderate to positive view towards the Welsh language was not enough to bring about a 'catch-up' in their understanding of the forms tested. Given the emphasis placed on attitude and its relationship with linguistic behaviour by many sociolinguists, educators, and in some cases those from a language policy/politics background (see Chapter 6 for an overview), it was surprising to discover that attitude played very little part in their overall language attainment in the context of this investigation.

Attitude towards Welsh, whilst generally positive, did not predict the participants' test scores. Excluding two cases, attitudes and participants' test scores were not significantly correlated (see table 7.2). The reasons for this possibly related to the sample contained in the study. Firstly, all participants attended a Welsh-medium primary school, attended predominantly Welsh secondary schools. Through this type of education, L2W participants in

particular would have at least acquired some level of Welsh, regardless of their attitude towards the language.

Although the role of attitude cannot be discounted entirely. The medium of education did not result in a ‘catch-up’ in all cases; thus, any possible ‘catch-up’ might occur post-education. Previous research has suggested that Welsh language use is generally reduced after school (Hodges, 2009; Morris, 2007). As results revealed that higher use of Welsh was related to higher language abilities (see Chapter 6), attitude might be a decider of whether Welsh is used rather than play a direct part in language attainment. While attitude was not correlated and did not predict language attainment, it was found to be significantly correlated and a predictor of use of Welsh amongst the L1W and L2W participants. Therefore, while attitude does not directly influence attainment, it does influence the use of Welsh. Although use, as explored in the current study, did not predict performance either.

7.3.3 *Language Confidence*

It could be said that having positive attitude towards Welsh and bilingualism may lead teenagers to use the language more often. Children have been found to show awareness of their own language ability, thus if children have low confidence in using Welsh they might avoid using the language altogether (Thomas & Roberts, 2011). While the results of Chapter 6 revealed a relationship between use and attainment, the frequency of its use is not a predictor of language ‘quality’ whereas their confidence with the language, particularly among L2 speakers, is. Language confidence was shown to correlate significantly and predict language performance (see table 7.2), meaning that those who harbour more confidence in their own language abilities are most likely to perform best on language tasks. While this effect was not found across all tests or bilingual groups, it does merit consideration. This result suggests if children feel confident in using the language, they might progress to using it

in situations in which they would receive exposure to grammatically rich and varied input that they might not receive if they do not use Welsh outside of their friendship group.

As with attitude, a significant relationship between confidence and L1W and L2W participants' use of Welsh was found. This finding is very interesting as it suggests that confidence plays a key role in L1W and L2W speakers' willingness to use Welsh, which may ultimately influence the nature of the type of Welsh they produce. In fact, as with attitude, confidence was also found to be a predictor of higher use of Welsh for both the L1W and L2W participants. This result does lend strong support to the need to ensure language confidence.

This effect however, was not found for 2L1. This is likely due to those from 2L1 backgrounds harbouring attitudes and self-ratings of confidence that are more neutral since they live in more bilingual contexts. L1W speakers, on the other hand, live a predominantly Welsh life that may automatically accrue positive attitudes and high self-ratings of abilities, whilst L2W attending Welsh-medium schools are often reminded about the positive aspects of bilingualism and of learning Welsh and might only engage in using Welsh if they are fully confident about their abilities.

Therefore, when discussing language success or maintenance emphasis should be placed on instilling confidence to use the language in more complex situations, rather than try to change attitude to improve language attainment. However, the role of attitude on language use should not be overlooked, due to the clear relationship between use and overall attainment. In order to identify the roles that attitude, use, and confidence play in more detail, a more complex statistical multiple regression model needs to be conducted.

7.4 *Limitations*

As the research conducted in this thesis was novel in its approach, combining psycholinguistic and social factors in order to explore grammar and vocabulary acquisition in

a minority language, the research was more or less exploratory. This came with its own challenges, and certain aspects key to the study, as with most language acquisition studies, could not be controlled for. While the study discusses linguistic input as a key component in language success, it is difficult to measure the exact amount of input a child receives – particularly when participants are teenagers. While Unsworth (2014) does deem her method of measuring input as suitable for older children, it was not suitable for this study as it required memory of previous experiences and required that responses be filled-in by parents. Given that the children were asked directly about their language use in the current study, it was deemed appropriate to select each group based on their current usage of Welsh with considerations made for any significant changes in language use.

Another possible limitation to the study was the cross sectional nature of the sample, that is, comparing two age groups rather than following the progress of one group longitudinally. Whilst a longitudinal study, such as the one undertaken by Paradis and Jia (2016), would have been beneficial as it would have aided in controlling for cohort effects such as changes in exposure and use, and how they affect an individual's overall ultimate attainment. Time constraints would have made it difficult to run the project for a long enough period of time to achieve this, and also to collect a large enough sample that could be generalizable to other populations (however, see future directions).

Whilst every effort was made to recruit equal numbers of participants in each group, due to the linguistic nature of the regions where the study was conducted, there were uneven numbers of participants in each sub group, particularly within the 12-13 age group. While for some tests, a 'catch-up' was found within this group, this may be due to the smaller number of 2L1 and L2 Welsh participants. Therefore, it is possible that if a larger sample was found then possibly the results might be different. That being said, finding an even number of participants from each bilingual group attending predominantly Welsh-medium schools is

difficult, with the majority in West Wales (where the sample was collected) being from L1 Welsh households. However, this study does provide a good base to expand upon with populations from different areas of Wales.

The results of the adult control group should be interpreted carefully for similar reasons. While the results did display ‘catch-up’ across the adult groups, a contrast to what was found in Thomas et al. (2014), the small number of participants who were classified as being from 2L1 or L2 Welsh backgrounds make the results difficult to generalise. As the data from the older teenagers suggests, certain structures are still not acquired fully at age 17. It could be inferred that full acquisition of these structures continues post education. For 2L1 and L2 Welsh adults to achieve comparable levels of attainment, a certain amount of interaction with the Welsh language is needed post-education. On this basis, it must be considered that full attainment of Welsh is only achievable on the caveat that Welsh becomes the primary language of communication post education.

However, the difficulty experienced in attracting a large number of L2 Welsh speakers for whom the Welsh language use has become the primary language of communication after leaving education highlights an issue whether or not Welsh-medium education lends itself as a means to produce willing speakers of Welsh outside of the education domain. Therefore, the limited number of adult L2W speakers makes it difficult to use the performance of the L2W adults in this study as representative of all L2 speakers. If the sample contained examples of all types of L2W speakers, not just ones where Welsh was the primary language of communication, then the performance could be considered more representative.

7.5 *Implications for Education Policy*

This thesis aimed to explore the factors that influence a bilingual ‘catch-up’ within a minority language context, and the role Welsh medium education may play in supporting this

catch-up among L2 speakers whose primary exposure is through school. The findings of each study that comprise the thesis (Chapters 3-6) have clear implications for language and education policy, given the importance of Welsh medium education to create new Welsh speakers.

Ensure any gaps between written and oral language do not become too large

Earlier in this Chapter, it was suggested that while L2W bilinguals might use written Welsh throughout their education, the window for correcting any grammatical errors might be restricted to Welsh language lessons. Therefore, as children become older, and hopefully use Welsh more socially, they may not necessarily receive as much support on their written skills –post 16 in particular. Therefore, it is plausible that gaps might appear between their written Welsh ability and their oral Welsh ability. As the emphasis usually is placed on producing speakers of Welsh, children might eventually leave school with stronger oral skills in comparison to written. If this is the case, then possibly educators need to place emphasis on good written as well as good oral skills to ensure that any gaps between the two do not become too large.

Policies should take into account the findings of research.

The findings of this study suggest that children do not achieve the desired outcomes as outlined by Welsh Government. Chapters 3-4 outlined the expected progression by the Welsh Government in establishing children's learning outcomes on measures of plural morphology and grammatical gender, it was noted that children attending Welsh medium education should have acquired these structures fully by age 11/12. This is incongruent to what was discovered in this study, revealing that in fact, only plural morphology is fully acquired by L1 Welsh bilinguals at 16/17 (if based on an 80% criterion). It was previously established that attainment of these structures is far from complete at this age (e.g. Gathercole & Thomas, 2009; Thomas & Gathercole, 2007; Thomas et al., 2014).

Furthermore, it is unclear on what these outcomes are based. While those in the education system, such as teachers, are likely to be aware of what a child's language outcomes should be, they may not be as informed to the attainment differences caused by varying quantity of input –which are well documented for a range of different bilingual populations. Therefore, co-operation between those who establish these outcomes and those who are experts in bilingual acquisition might be of benefit to all parties involved, leading to more realistic and attainable outcomes. Therefore, communication between researchers and policy makers needs to be established so that future outcomes set by Government take into account findings of current research within the different fields before setting any educational outcomes.

Success criteria should distinguish clearly between expectations laid out for L1, 2L1 and L2 speakers for both Welsh and English.

As minority language survival is generally reliant on education (Fishman, 1991; Hickey, 2007; Morris & Jones, 2008) large proportions of Welsh speakers tend to be produced through the education system. A second issue with the aforementioned outcomes is that they do not distinguish between the learning outcomes of L1W children and that of their 2L1 and L2W peers. Given the quantitative differences in input children from different language backgrounds receive, 2L1 and L2W bilinguals cannot be expected to adhere to the same performance patterns as L1W bilinguals. Therefore, any outcomes set need to take into account these differences, and appropriate outcomes created taking this into account.

Promote true bilingualism

Bilingual education should aim to produce fully bilingual students. Nevertheless, the emphasis has usually (and understandably) been placed on supporting and promoting the use of Welsh within L2W bilinguals. An issue highlighted in this thesis, particularly in relation to vocabulary knowledge, is the need to assess and support students' development in both

languages (English and Welsh in the present context). Although the minority language status of Welsh has made Welsh language skills a priority, educators must ensure that they also support English language skills within L1W bilinguals. Even though there were no significant differences between L1W and L2W bilinguals in their English vocabulary, differences were seen between the L1W participants' success on the Welsh vocabulary test and that of their English with performance higher on the Welsh in comparison to the English.

Whilst it is logical to assume that children from L1W backgrounds will acquire English effortlessly and converge with L1 English at an early age due to the dominant nature of English (Gathercole & Thomas, 2009). However, if an L1 Welsh child lives in a predominantly Welsh speaking community, attends a predominantly Welsh-speaking school, and receives only Welsh input from family, it is a real possibility that their English might lag behind on measures of English grammar (e.g Rhys & Thomas, 2013). Therefore, one suggestion is for attention to be placed on ensuring that children, regardless of background, do not lag behind on either one of their two languages across all skills.

7.6 *Implications for Theory*

In line with research on younger Welsh-English bilinguals (Thomas et al., 2014; Gathercole & Thomas, 2009; Gathercole, Thomas, & Laporte, 2001) and other populations of bilinguals (e.g. Paradis, 2011; Paradis & Jia, 2016; Blom et al., 2012; Gathercole, 2002), input quantity had a clear influence on the target language's development in the current study, and continued to influence late-stage language development, as predicted by constructivist accounts of bilingual acquisition (e.g., Gathercole, 2007). These findings are also in line with the Usage-Based account, which stipulates that an individuals' language environment shapes their language development across linguistic sub-domains (Bybee, 2010). The complex opaqueness of the structures investigated reiterate claims that the

systems in question continue to be acquired in a piecemeal, item-by-item process, rather than through systematic extraction of the rules (Gathercole & Thomas, 2005).

7.7 *Implications for Bilingual Development*

A question raised from the findings highlighted in this thesis are the expected long-term outcomes of 2L1 and L2 Welsh-English bilinguals acquiring a minority language in the face of a dominant language. It is clear that acquisition of a language is more than simply input, with relationships discovered between their use of Welsh and that of their language confidence. Others have suggested that a crossover between a bilinguals' two languages could improve the time it takes to 'catch-up' (Paradis & Jia, 2016; Cummins, et al., 2012; Paradis, 2010; Gathercole, 2007), while others have suggested that cognitive benefits gained from dual language use might aid language learning (Peets & Bialystok, 2010).

However, the outcomes of bilinguals will always be heterogeneous. Thus comparing the outcomes of 2L1 and L2 Welsh children to that of their L1 Welsh peers is difficult, due to the variation in their language experience. Given the complex nature of some grammatical properties, coupled with the minority language status of the Welsh language, it is clear that this 'catch-up' will take far longer than previously anticipated (Hakuta et al., 2000; Saunders & O'Brien, 2006), and possibly might never occur.

This result raises the question as to what is a realistic expectation of 2L1 and L2 minority language child. Expecting children from these backgrounds to converge under these conditions might be unfair. In addition, given the heterogeneous nature of bilingual linguistic development, why is it expected of 2L1 and L2W to converge to that of L1W speakers, and why are L1 Welsh standards held as the 'gold-standard' for comparison. Investigating the comparison is a useful tool from an educational perspective, interpretations of divergence between bilinguals in their long-term outcomes should be careful not to promote a deficit view of bilingualism (Paradis et al., 2016). Therefore, possibly this idea of 'catch-up' is too

narrow, and educators might do well to move past expecting L2W children to adhere to the same attainment patterns as their L1W, and 2L1 peers.

7.8 *Suggestions for Future Research*

Although this thesis has helped address some of the key gaps within the existing literature, it has highlighted certain avenues that could be investigated in order to have a more comprehensive understanding of the different factors that influence Welsh language acquisition. Firstly, future research might aim to conduct longitudinal studies assessing the long-term linguistic outcomes of Welsh-English bilingual children from different language backgrounds. The lack of clear attainment outcomes for bilingual children poses an issue for method of using education to produce speakers, a key area highlighted by the Government as a means to achieve 1 million Welsh speakers by 2050 (Welsh Government, 2016). Thus, assessing the long-term rate and pattern of different bilingual children's language attainment, is needed. A development of a model that takes into account the quantity and richness of input of both languages along with children's language habits could aid in predicting the linguistic outcomes of Welsh-English bilinguals. A formation of a model coupled with appropriate interventions in place to ensure that no children lag behind in their Welsh acquisition. However, to be able to achieve this, better Welsh-medium standardised testing materials are required to ensure effective assessment for all linguistic sub-domains that are suitable for older children as well as younger children.

A key argument in the transmission of language is that L2 Welsh speakers fail to utilize Welsh outside of the schooling system, the effect this has on their Welsh language abilities is unknown; however, it is likely that they might suffer attrition in their Welsh language when this occurs (Sorace, 2014). Similarly, L1 Welsh speakers might also experience a 'dominance shift' (Kohnerts & Bates, 2002) after leaving education, especially if further education is predominantly through the medium of English. Therefore, further

research could investigate the long-term effects of increase use of the dominant language against the minority language and the overall quality of Welsh within those individuals. As it is clear from the findings of this thesis, some Welsh language structures are acquired beyond age 16/17. Therefore, investigating the effects of post education language choices has for the ultimate attainment of Welsh, whether these choices result in a dominance shift, or attrition, and what does that mean, (in terms of quality of input), for language transmission would provide additional knowledge.

7.9 *General Conclusion*

In conclusion, the research conducted in this thesis has built upon past research conducted in the field of language acquisition in a minority language context (e.g Thomas et al., 2014; Gathercole & Thomas, 2009). It established that while ‘catch-up’ was seen within participants aged 12-13, it was not long term with a bilingual ‘catch-up’ on the whole unlikely to occur for older L2 Welsh bilinguals, for measures of morphology and vocabulary, and only occurred for 2L1 bilinguals for measures of vocabulary and grammatical gender. The failure of older L1 Welsh bilinguals to fully master grammatical gender suggest that complexities and opaqueness of the structures tested results in development being protracted and variable and implied that full acquisition may be reliant on factors beyond input (Carroll, 2017).

Furthermore, the research conducted took a novel approach and coupled the participants’ morphological and vocabulary scores and assessed the relationship between sociological factors and that of their overall abilities. While relationships were found between use of Welsh, it was not a predicting factor in attainment scores. No relationship was discovered between language attitude and attainment; however, language confidence was found to be a predictive factor. Thus the findings demonstrate that using Welsh does not

necessarily result in full language attainment of all structures, however strong language confidence potentially might.

Lastly, the question remains to whether 2L1 and L2 Welsh bilinguals' linguistic knowledge should be expected to converge with that of their L1 Welsh counterparts. With variation in language experience and input remaining throughout individuals' lives, it is possibly that the ability of Welsh-medium education as a means to produce fully proficient Welsh-English bilinguals might be overstated. Therefore, a new set of expectations and timeframes need to be produced for 2L1 and L2 Welsh bilinguals that take into account the linguistic variability that they experience throughout their lives.

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Appendices

Appendix A

Parental Information Sheet and Consent Form

Participant Consent Form

Parental Information Sheet and Consent Form

Exploring the 'bilingual catch-up' in Welsh-English Bilingual Teenagers

Gwybodaeth i Rhieni

Information for Parents

Gwybodaeth am yr astudiaeth

Rydym yn eich gwahodd i ganiatáu eich plentyn i gymryd rhan mewn astudiaeth sy'n edrych ar y ffactorau sy'n dylanwadu ar sut mae unigolion yn ddysgu gwahanol strwythurau iaith pam meant yn dysgu iaith lleiafrifol. Mae astudiaethau blaenorol wedi dangos bod plant dwyieithog sy'n derbyn y swm lleiaf o fewnbwn o unrhyw un o'u hieithoedd yn tueddu i ddatblygu'r iaith honno yn arafach na phlant dwyieithog sy'n derbyn mwy o fewnbwn o'r iaith honno. Fodd bynnag, pan mae'r mewnbwn mae'r plant yn derbyn yn cynyddu dros amser, bydd y plentyn yn dod yn fwy hyderus yn yr iaith, a gall y gwahaniaethau hyn yn diflannu yn y pen draw. Mae gennym ddiddordeb i adnabod y ffactorau sy'n dylanwadu ar y 'dal i fyny' hyn mewn gallu plant dwyieithog yn y Gymraeg. Rydym am edrych ar y tri math gwahanol o bobl ddwyieithog Cymraeg-Saesneg : y rhai y mae ei rhiant yn siarad Cymraeg â nhw, ond cael mewnbwn Saesneg yn bennaf yn y gymuned ehangach; y rhai sydd ag un rhiant yn siarad Cymraeg, ac mae'r llall yn siarad Saesneg iddynt; a'r rhai y mae ei rhiant yn siarad Saesneg â nhw, ond sydd yn mynd i ysgol cyfrwng Cymraeg. Y ffactorau gennym ddiddordeb mewn yn cynnwys yr amllder mae plant yn dod i gysylltiad â, a'i ddefnyddio o'r Gymraeg, agweddau plant tuag at y Gymraeg, ieithoedd lleiafrifol, a dwyieithrwydd, a hyder y plant wrth ddefnyddio'r iaith.

Information about the study

We are inviting you to allow your child to take part in a study looking at the factors which influence individuals' abilities to learn different language structures in a minority language context. Previous studies have shown that bilingual children who receive the least amount of exposure to any one of their languages tend to acquire aspects of that language slower than bilinguals who receive more exposure to that language. However, as the frequency of exposure increases over time and the child becomes more confident with the language, these differences can eventually disappear. We are interested in identifying the factors that influence this 'catch-up' in bilingual children's knowledge of Welsh among three different types of Welsh-English bilinguals: those whose parent(s) speak Welsh to them, but access English mainly in the wider community; those who have one parent speaking Welsh, and the other speaking English to them; and those whose parent(s) speak English to them, but who attend a Welsh-medium school. The factors we are interested in include frequency of exposure to and use of Welsh, children's attitudes towards Welsh, minority languages, and bilingualism, and children's confidence in using the language.

Pam bod ni'n holi i'ch plenty gymryd rhan?

Er mwyn sefydlu'r uchod, mae'n hanfodol i asesu plant dwyieithog Cymraeg-Saesneg o wahanol gefndiroedd ieithyddol sy'n derbyn addysg ddwyieithog. Felly, rydym yn gwahodd plant o gartrefi lle Cymraeg yn unig yn cael ei ddefnyddio, lle mae y Gymraeg a'r Saesneg yn cael ei ddefnyddio, a lle mai dim ond Saesneg yn cael ei defnyddio.

Why are we asking your child to take part?

In order to establish the above, it is crucial to assess Welsh-English bilingual children from different language backgrounds who are receiving bilingual education. Therefore we are inviting children from homes in which only Welsh is used, where both Welsh and English is used, and where only English is used.

Beth sydd yn digwydd yn yr astudiaeth?

Gofynnir i'ch plentyn i gwblhau tasgau iaith wahanol a gynlluniwyd i brofi eu gwybodaeth oddefol a chynhyrchiol o'r Gymraeg. Er enghraifft, bydd yn cael cyfres o eiriau a gofynnwyd iddynt llenwi-y gair sydd ar goll o'r rhestr neu o'r categori; neu byddant yn cael eu dangos nifer o ddatganiadau a gofynnwyd iddynt lenwi y blanc; neu i farnu pa mor dderbyniol yw brawddegau penodol. Byddant hefyd yn cael holiadur yn gofyn iddynt raddio cyfres o ddatganiadau yn ymwneud â'u hagweddau tuag at yr iaith, ieithoedd lleiafrifol, a dwyieithrwydd, eu hyder wrth ddefnyddio iaith, a ble a pha mor aml y maent yn defnyddio eu dwy iaith. Bydd y rhan fwyaf o

asesiadau yn cael eu cynllunio i gael eu rhoi i grwpiau o fyfyrwyr ar y tro, er mwyn lleihau'r amser i ffwrdd o'r ystafell ddosbarth.

What happens in the study?

Your child will be asked to complete different language tasks designed to test their receptive and productive knowledge of Welsh. For example, they will be given a series of words and asked to fill-in the missing word from the list or category or they will be shown a number of statements and asked to fill in a blank or to judge the acceptability of certain sentences. They will also be given a questionnaire asking them to rate a series of statements relating to their attitudes towards language, minority languages, and bilingualism, their confidence in using language, and where and how often they use their two languages. Most assessments will be designed to be given to groups of students at a time, to minimise the time away from the classroom.

A oes yna unrhyw fanteision neu beryglon?

Nid ydym yn rhagweld bydd yna unrhyw beryglon i'ch plentyn wrth gymryd rhan yn yr ymchwiliwr yma, er hynny, os mae eich plentyn ddim eisiau cymryd rhan ni fydd yn cael ei orfodi. Er bod yna ddim manteision i chi'n bersonol, bydd y wybodaeth casglwyd yn yr astudiaethau yma o gymorth mawr i ddeall sefyllfa'r iaith Gymraeg, a sut mae yn cael ei ddefnyddio gan bobl ifanc.

What are the risks and advantages?

We do not foresee any risks involved for your child in taking part in this study; however, if your child does not wish to take part or continue to take part in the study, they will not be forced into doing so. While there are no advantages for you personally, the information collected in these studies will be of great benefit to our understanding of issues relating to the current state of the Welsh language, and the way it is used among young people.

Beth fydd yn digwydd i ddata fy mhlentyn?

Er mwyn diogeli breifatrwydd, bydd pob cyfranogwr yn cael cod bydd ond yn wybodus i'r ymchwiliwr. Bydd y data i gyd yn cael ei throsglwyddo i liniadur wedi'i diogelu gan gyfrinair bydd ond ar gael i'r ymchwiliwr. Bydd y data crai i gyd yn cael ei gadw mewn ffeil gabinet ym Mhrifysgol Bangor, yna yn cael ei dinistrio o dan ganllawiau'r brifysgol. Er hynny, os fydddech chi'n dewis i dynnu eich plentyn allan o'r astudiaeth, mae gennych hawl i wneud hyn at unrhyw bryd, a bydd data eich plentyn yn cael ei dinistrio.

What will happen to your child's data?

In order to protect anonymity, all participants will be assigned a code which only the researcher will know. All data will be transferred to a password protected laptop, which only the researcher has access to. The raw data and consent forms will be kept in a locked filing cabinet at Bangor University, and then destroyed in accordance to University guidelines. However, if you decide to withdraw your child from the study, you can do so at any time and all data collected on your child will be destroyed.

Beth os mae fy mhlentyn ddim eisiau cymryd rhan?

Mae o i fyny i chi os chi am adael eich plentyn cymryd rhan yn yr astudiaeth yma, does dim rhwymedigaeth arnoch i gymryd rhan. Hyd yn oed ar ôl rhoi caniatâd, mae gennych yr hawl i dynnu eich plentyn allan o'r astudiaeth at unrhyw bwynt.

What if I don't want my child to take part?

It is your decision to allow your child to take part in this study; you are not obliged to take part. Even after granting permission, you have the right to withdraw your child at any time.

Gwybodaeth Cysylltu

Os mae gennych unrhyw gwestiynau am yr astudiaeth, neu eisiau fwy o wybodaeth, croeso a chi i gysylltu â Hanna Binks ym Mhrifysgol Bangor. E-bost: elp279@bangor.ac.uk. Rhif ffôn: 01248388571

Os bydddech chi'n DDIM eisiau eich plentyn cymryd rhan yn yr astudiaeth, arwyddwch y slip a'i hanfon nôl i'r ysgol cyn (DYDDIAD) os gwelwch yn dda.

Mae cymryd rhan yn yr astudiaeth yn gwbl wirfoddol ac fe allwch chi dynnu eich plentyn allan o'r astudiaeth at unrhyw bwynt heb reswm. Os chi yn dewis gwneud hynny ar ôl i'r data cael ei gasglu, bydd y data i gyd sydd wedi casglu ar eich plentyn yn cael ei dinistrio. Os bydd eich plentyn ddim eisiau cymryd rhan, ni fydden yn cael ei gorfodi, hyd yn oed os chi wedi rhoi caniatâd.

Diolch ymlaen llaw am eich amser,
Yn gywir,

Hanna Binks
Myfyrwraig PhD gyda Phrifysgol Bangor.

Contact Details

If you have any other questions about the research, or desire more information, feel free to contact Hanna Binks at Bangor University. Email: elp279@bangor.ac.uk. Phone: 01248388571

If you would DO NOT want your child to take part in this study, please sign and return the slip at the bottom of the page to the school before (INSERT DATE)

Taking part in this study is completely voluntary and you may remove your child at any time during, and after the study has ended without reason. If you do decide to remove your child from the study after data has been collected, we will destroy all data collected on your child. If your child does not want to take part, we will not force them to, even if parental consent has been obtained.

Thank you in advance for your time.

Sincerely,

Hanna Binks

PhD student at Bangor University.

Ffurflen Caniatad/Consent Form

Dwi ddim yn caniatâd i'm mhlentyn cymryd rhan yn yr astudiaeth yma. *I do not consent to my child's participation in this study.*

Llofnod/Signed: _____ Dyddiad/Date: ____/____/____

Enw'r Plentyn/Child's Name: _____

Enw'r Ysgol/Name of School: _____

Dyddiad Geni'r Plentyn/Child's Date of Birth: ____/____/____

Participants Consent Form

Gwybodaeth i Cyfranogwyr

Rydym yn dy wahodd i gymryd rhan mewn astudiaeth. Prif amcan yr astudiaeth yw edrych ar y ffactorau sy'n dylanwadu ar sut mae unigolion yn dysgu gwahanol strwythurau mewn iaith leiafrifol, a sut mae'r ffactorau hyn yn dylanwadu ar eu parodrwydd i siarad Cymraeg fel oedolion ifanc. Er mwyn sefydlu'r uchod, mae'n hanfodol asesu plant ac oedolion dwyieithog Cymraeg-Saesneg o wahanol gefndiroedd ieithyddol sydd wedi derbyn addysg dwyieithog.

Yn yr astudiaeth bydd gofyn i ti lenwi holiadur am dy gefndir iaith, cyn symud ymlaen i gwblhau cyfres o dasgau sydd yn ymdrin â rhai systemau ieithyddol. Bydd yr holl atebion yn cael eu cadw yn gyfrinachol.

Rydw i yn cytuno i gymryd rhan yn yr astudiaeth yma. (☐)

1. Rydw i yn cytuno i gymryd rhan yn yr astudiaeth yma.

Enw: _____ Dyddiad ____/____/____

Llofnod: _____

Appendix B

Grammatical Gender Test

Plural Morphology Test

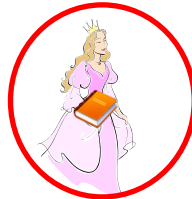
Language Background and Use Questionnaire

Grammatical Gender Test

Cenedl-enwi

Yn yr dasg yma, rydw i eisiau i ti ddarllen yr brawddegau isod, a cylchu'r llun sydd yn cael ei gyfeirio ato yn yr ail frawddeg. Os ti ddim yn siŵr, dyfala!

Engraifft: Roedd y **prifathro golygus** a'r **dywysoges brydferth** yn y llyfrgell. Gafaelodd **hi** mewn llyfr. Mae'r 'hi' yn cyfeirio at yr dywysoges, felly byt yn cylchu'r tywysoges



1. Dyma'r **fwyll frown** a dyma'r **gwely coch**. Ond mae'i goes wedi plygu.



2. Dyma'r **plismon gwirion** a dyma'r **dywysoges dal**. Mae yna esgid oren am ei droed.



3. Roedd y **drwm tenau** a'r **bêl frown** mewn bocs. Ond mi ddisgynodd hi drwy'r gwaelod.



4. Dyma'r **wraig wirion** a dyma'r **tywysog clên**. Ma na het ar ei ben.



5. Dyma'r **bwrdd brown** a dyma'r **ddesg goch**. Ond mae'i choes wedi torri.



6. Aeth y **ddafad wirion** a'r **ci tew** am dro i'r cae. Ond mi aeth hi yn sownd mewn clawdd!



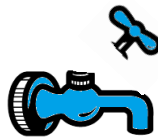
7. Dyma'r **gath dew** a dyma'r **draenog pigog**. Ond mae na bili-pala ar ei thrwyn.



8. Dyma'r **crys pinc** a dyma'r **wasgod ddu**. Ond mae'i phoced yn las.



9. Roedd y **fased goch** a'r **tap glas** ar y ffenest. Ond mi wnath o dorri.



10. Dyma'r **afr frown** a dyma'r **blaidd glas**. Ond mae na sanau ar i glust.



11. Dyma'r **pengwin tal** a dyma'r **dylluan binc**. Ond mae na hosan ar ei chlust.



12. Dyma'r **gyllell ddu** a dyma'r **plât coch**. Ond mae hi ar y bwrdd.



13. Roedd y **crys brown** a'r **wasgod binc** yn y cwpwrdd. Ond doedd 'na ddim botymau arno fo.



14. Dymar **bioden ddu** a dyma'r **twrci brown**. Ma na het am ei ben.



15. Dyma'r **glöyn byw coch** a dyma'r **fuwch las**. Ond mae na rhywbeth ar ei drwyn.



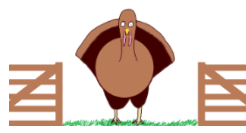
16. Dyma'r **brifathrawes flin** a dyma'r **brenin drwg**. Mar na lyfr wedi disgyn ar ei throed.



17. Roedd y **blaidd du** a'r **afr binc** yn byw ar fferm. Ond roedd hi'n byw mewn cae.



18. Roedd y **fuwch ddu** a'r **twrci brown** mewn cae. Ond mi redodd o allan drwy'r giat.



19. Dyma'r **bêl biws** a dyma'r **tecell du**. Ond mae na rhywbeth od iawn ar ei ben.



20. Dyma'r **gŵr pwysig** a dyma'r **ddynes dda**. Mae na het ar ei phen.



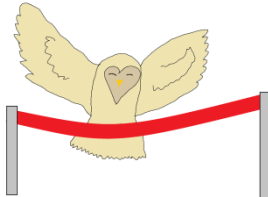
21. Aeth y **pengwin cysglyd** a'r **gath flinedig** i'w gwelyau. Aeth o i gysgu gyntaf.



22. Dyma'r **gyfneither glên** a dyma'r **dyn tal**. Mae'i got yn binc.



23. Penderfynodd y **dylluan denau** a'r **glöyn byw glas** gael ras. Y tro yma, hi enillodd.



24. Dyma'r **drych tenau** a dyma'r **gadair las**. Ond mae na lythyr ar ei dop.



25. Roedd **delyn denau** a'r **gitar du** yn yr ystafell. Ond does na'm llinynnau arni hi.



26. Dyma'r **cefnder blin** a dyma'r **frenhines bwysig**. Mae'i chot yn goch.



27. Dyma'r **draenog pigog** a'r **bioden goch**. Ond mi ddisgynodd o i ffwrdd



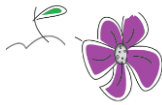
28. Dyma'r **dorth dew** a dyma'r **popty glas**. Ond mae na gyllell ar ei thop.



29. Dyma'r **ci du** a dyma'r **ddafad goch**. Mae yna bry bach ar ei phen.



30. Roedd y **blodyn piws** a'r **ddysgl las** ar y bwrdd. Ond nath o dorri.



Plural Morphology Test

Beth ydi mwy nag un....

Edrychwch ar yr geiriau canlynol. Beth yw'r gair sydd yn disgrifio mwy nag un o'r geiriau? Os ti ddim yn siŵr, dyfala!

E.e. Mwy nag un 'afal' yw 'afalau', felly mae angen rhoi 'afalau' yn y bocs, a.y.y.b.

Beth ydi mwy nag un..... ?	Ateb
Afal	afalau

Beth ydi mwy nag un..... ?	Ateb
Plentyn	
Hedyn	
Gewin	
Blaid	
Llwynog	
Gafr	
Chwilen	
Ci	
Fforc	
Deigryn	
Palmant	
Hwyaden	
Pluen	
Castell	
Llygoden	
Llyfrgell	
Aderyn	
Deilen	
Coeden	
Llechen	
Nant	
Person	
Llaw	
Hoelen	
Athro	

Language Background and Use Questionnaire

Cwestiynau Cefndirol

Yn yr rhan yma mae gofyn i ti roi gwybodaeth am dy hun, ac am dy gefndir iaith. Mae hyn yn cynnwys dy ddefnydd o Gymraeg a Saesneg nawr, ac pan oedddest ti'n iau. Paid â phoeni os nad ydych yn cofio, neu ddim yn 100% siwr, rho beth sydd yn fwyaf tebyg i'r hyn rwyt yn ei gofio.

1. A wyt ti yn: ☐ Ferch ☐ Bachgen

2. Faint yw dy oed?

3. Enw dy ysgol gynradd

4. Enw dy ysgol uwchradd

5. Wyt ti wedi byw mewn unrhyw ardal/gwlad heblaw am lle ti'n byw nawr?

5. Beth yw'r brif iaith sy'n cael ei siarad yn y cartref? (h.y. Pa iaith sy'n cael ei defnyddio fwyaf yn y tŷ)

☐ Cymraeg, 100%

☐ Cymraeg, 80%

☐ Cymraeg, 40-60%

☐ Saesneg, 100%

☐ Saesneg, 80%

☐ Saesneg, 40-60%

☐ Cymraeg a Saesneg yn gyfartal (h.y. un rhiant un iaith, rhiant arall iaith arall)

☐ Arall:

6. Beth yw swyddi dy rieni?

Mam:

Dad:

7. Pa iaith wyt ti yn siarad efo aelodau o dy deulu a pha iaith maen nhw'n siarad efo ti?
[ysgrifenna lle yn berthnasol]

	Iaith dwi yn siarad efo nhw Cymraeg/Saesneg/y ddwy/arall	Iaith maen nhw'n siarad efo fi Cymraeg/Saesneg/y ddwy/ arall
Mam		
Dad		
Brawd/ brodyr		
Chwaer/ chworydd		

8. Pa iaith wyt ti'n hoffi siarad fwyaf? (✓)

☐ Cymraeg ☐ Saesneg ☐ Dim blaenoriaeth

☐ Arall _____

9. Efo teulu estynedig, pa iaith ydych chi'n siarad efo'ch gilydd? [✓ os yn berthnasol]

	Teulu ochr Mam				
	Bron bob amser yn Gymraeg	Cymraeg rhan fwyaf	Cymraeg a Saesneg	Saesneg rhan fwyaf	Bron bob amser yn Saesneg
Modryb/ Anti					
Ewythr/ Wncwl					
Cefnder					
Cyfnither					
Nain/Mamgu					
Taid/Dadcu					
	Teulu ochr Dad				
Modryb/ Anti					
Ewythr/ Wncwl					
Cefnder					
Cyfnither					
Nain/Mamgu					
Taid/Dadcu					

10. Pa ffactorau/pethau eraill sydd yn dylanwadu ar dy barodrwydd i siarad Cymraeg neu peidio?

11. Pa iaith wyt ti a **dy deulu** yn siarad efo'ch gilydd? [✓ os yn berthnasol]

	Bob amser yn Gymraeg	Cymraeg rhan fwyaf	Cymraeg a Saesneg	Saesneg rhan fwyaf	Bob amser yn Saesneg
Ar y stryd, mewn siopau, caffi a.y.y.b					
Allan gyda'r nos					
Mewn clybiau chwaraeon					
Mewn clybiau eraill (e.e. c.f.f.i, drama, Urdd a.y.y.b)					
Tecstio/e-bostio/ WhatsApp					
Ar y ffôn					
Yn sgwennu ar facebook					
Yn sgwennu ar twitter					
Arall (snapchat, instagram a.y.y.b)					

12. Pa iaith wyt ti a **dy ffrindiau** yn siarad efo'ch gilydd tra..... ? [✓ os yn berthnasol].

	Bob amser yn Gymraeg	Cymraeg rhan fwyaf	Cymraeg a Saesneg	Saesneg rhan fwyaf	Bob amser yn Saesneg
Yn y dosbarth					
Tu arall y dosbarth (iard, coridor)					
Tu allan yr ysgol					
Ar y stryd, mewn siopau, caffi a.y.y.b					
Allan gyda'r nos					
Mewn clybiau chwaraeon					
Mewn clybiau eraill (e.e. c.f.f.i, drama, Urdd a.y.y.b)					
Ar y ffôn					
Tecstio/e-bostio/ WhatsApp					
Yn sgwennu ar facebook					
Yn sgwennu ar twitter					
Yn sgwennu ar instagram					
Arall (snapchat a.y.y.b)					

12. Pa iaith wyt ti'n tueddol o ddefnyddio i ddechrau sgwrs efo ffrind?

☐ Cymraeg ☐ Saesneg ☐ Y ddwy ☐ Arall_____

13. Beth oedd PRIF IAITH dy grŵp ffrindiau yn yr ysgol GYNRADD?

☐ Cymraeg ☐ Saesneg ☐ Y ddwy ☐ Arall_____

14. Beth yw PRIF IAITH dy grŵp ffrindiau yn yr ysgol UWCHRADD?

☐ Cymraeg ☐ Saesneg ☐ Y ddwy ☐ Arall_____

15. Pa iaith bydde ti'n defnyddio i ddechrau sgwrs efo POBL TI YN NABOD?

☐ Cymraeg ☐ Saesneg ☐ Y ddwy ☐ Arall _____

16. Pa iaith bydde ti'n defnyddio i ddechrau sgwrs efo POBL TI DDIM YN NABOD?

☐ Cymraeg ☐ Saesneg ☐ Y ddwy ☐ Arall _____

17. Wyt ti'n teimlo bod ti'n defnyddio mwy neu lai o Cymraeg ers gadel ysgol gynradd?

☐ Cynyddu ☐ Lleihau ☐ Dim newid

18. Unrhyw rhesymau penodol am y newid yma yn dy farn di?

19. Yn dy farn di, ydy'r rhain yn cael dylanwad ar ba iaith wyt ti'n dewis ei ddefnyddio [✓]

	Ydy	Nac ydy
Yr iaith 'dw i'n siarad gartref		
Yr iaith mae fy ffrindiau yn ei siarad fwyaf		
Pwnc y sgwrs		
Pwy sy'n rhan o'r sgwrs		
Fy nealltwriaeth o'r pwnc sy'n cael ei trafod		
Lleoliad yr sgwrs (gwaith, gartref, doctor a.y.y.b)		
Faint o eiriau dw i'n gwybod am y pwnc trafod		

20. Oes unrhyw ffactorau arall yn dylanwadu pa iaith ti'n dewis defnyddio?

13. Wyt ti'n teimlo'n hyderus yn trafod y pynciau hyn yn y Gymraeg: [✓]

	Hyderus iawn	Eithaf hyderus	Dim yn hyderus
Grwpiau pop			
Hel clecs ('Gossipan')			
Rhaglenni teledu/ffilmiau			
Gwyddoniaeth			
Y tywydd			
Chwaraeon			
Fy niddordebau			
Gwaith			

21. Yn dy farn di, i ba raddau mae'r canlynol yn dylanwadu ar dy ddefnydd o'r Gymraeg tu allan i'r ysgol? [✓]

	Llawer fawr	Rhywfaint	Ddim llawer	Dim o Gwbl
Mam				
Dad				
Brodyr/Chwiorydd				
Teulu estynedig				
Fy ffrindiau				
Fy nghymdogion				
Athrawon				
Faint o Gymraeg mae pobl yn siarad yn y gymuned				
Cerddoriaeth				
Rhaglenni teledu				
Os dw i wedi arfer siarad am y pwnc yn y Gymraeg				
Os ydw i wedi arfer siarad â'r person yn Gymraeg				

22. Pa mor dda **wyt ti'n** barnu dy allu yn y Gymraeg? (✓)

☐ Ardderchog

☐ Da iawn

☐ Da

☐ Derbyniol

☐ Ddim yn dda

☐ Gwael

23. Pa mor dda **wyt ti'n** barnu dy allu yn Saesneg? (✓)

☐ Ardderchog

☐ Da iawn

☐ Da

☐ Derbyniol

☐ Ddim yn dda

☐ Gwael

14. Pa iaith wyt ti'n debygol o'i defnyddio wrth wneud y canlynol...? [✓]

	Cymraeg	Saesneg	Y ddwy iaith	Arall/Dim
Gwrando ar gerddoriaeth				
Gwyllo teledu				
Darllen				

15. Faint wyt ti'n cytuno efo'r brawddegau isod? Noda dy ymateb ar raddfa o 1-10, lle mae 1 yn golygu dy fod yn cytuno'n gryf, a 10 yn golygu dy fod yn anghytuno'n gryf. Bydd dy atebion yn hollol gyfrinachol, felly fydda'n onest yn dy farn. [cylcha'r rhif sy'n dangos ble ar y raddfa ti'n barnu'r frawddeg.]

Rydw i'n gwerthfawrogi fy mod i'n siarad Cymraeg.									
1	2	3	4	5	6	7	8	9	10
Mae'n well dysgu Ffrangeg na Chymraeg os ydych eisiau cael ymlaen yn y byd.									
1	2	3	4	5	6	7	8	9	10
Mae siarad Cymraeg yn help i bobl gael swyddi da.									
1	2	3	4	5	6	7	8	9	10
Does dim pwynt dysgu Cymraeg os chi'n bwriadu gadael Cymru.									
1	2	3	4	5	6	7	8	9	10
Mae'n bwysig fod plant yn dysgu Cymraeg.									
1	2	3	4	5	6	7	8	9	10
Mae'n bwysig siarad iaith mae pawb yn ei deall wrth gymdeithasu.									

1	2	3	4	5	6	7	8	9	10
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20. Wyt ti'n siarad 'Wenglish' yn aml? Wyt ti'n teimlo fod yna unrhyw beth o'i le am wneud hynny?

21. Yn dy farn di, be ydi'r ffactorau sydd mwyaf tebygol o ddylanwadu dy barodrwydd di i siarad Cymraeg?

22. Pa ffactorau, yn dy farn di, sy'n cyfrannu at y ffaith fod nifer o blant sy'n medru siarad Cymraeg yn dewis peidio gyda'i ffrindiau?

Appendix C

Regression Scatterplots

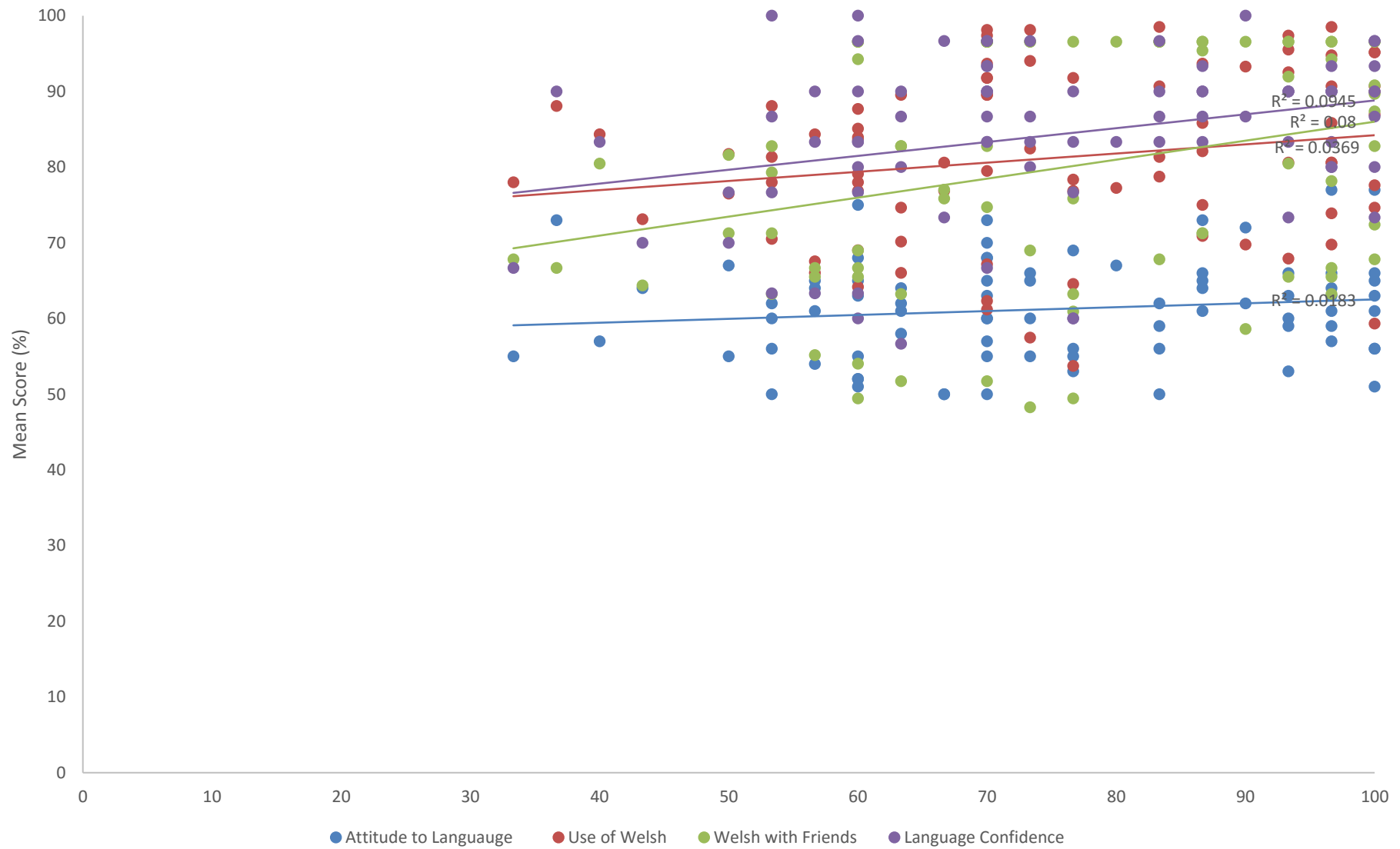


Figure 6.4: Relationship between LIW participants' Gender scores and their Use of Welsh, Attitude, and Confidence

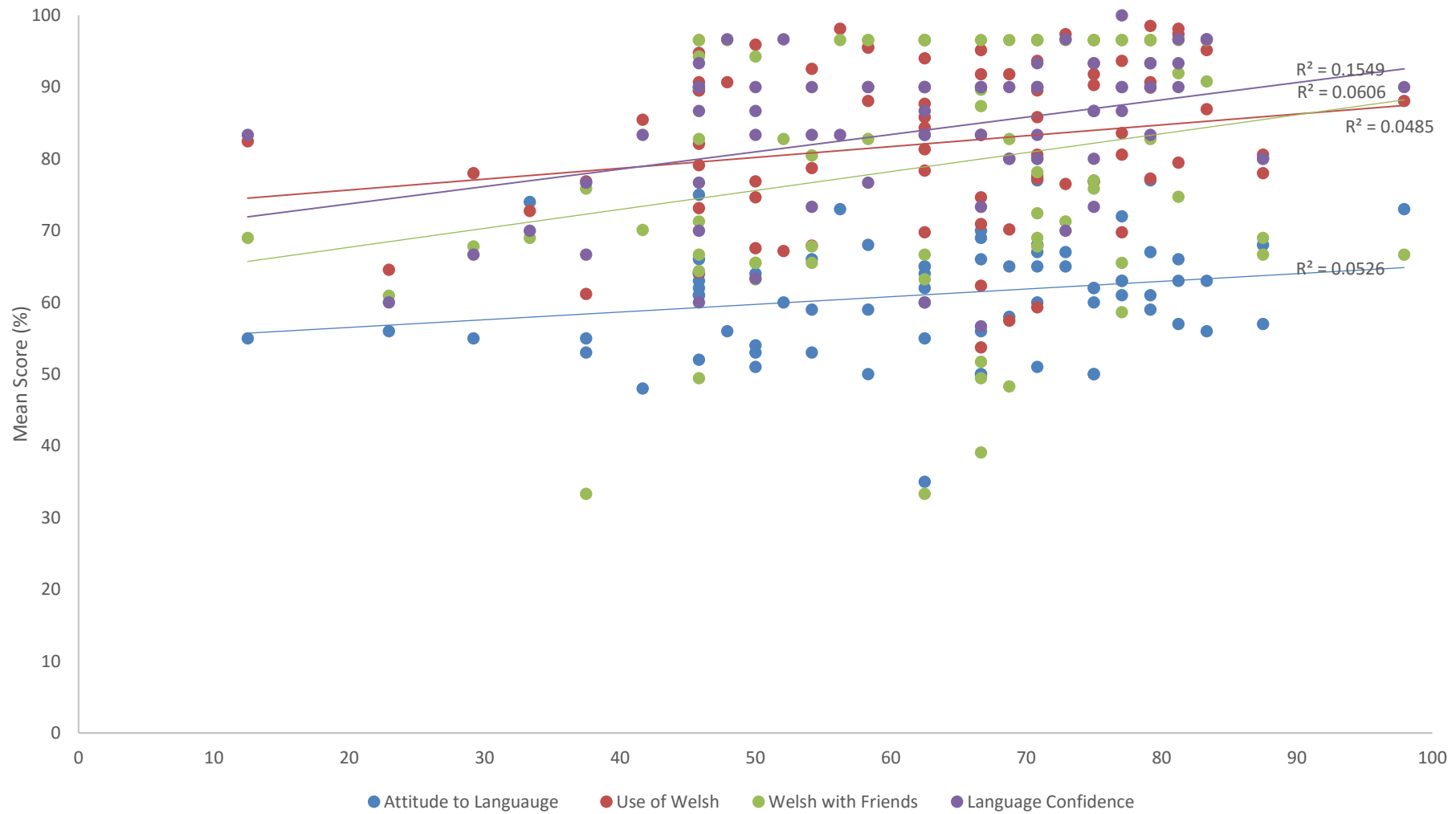


Figure 6.5: Relationship between L1W participants' Plural scores and their Use of Welsh, Attitude, and Confidence

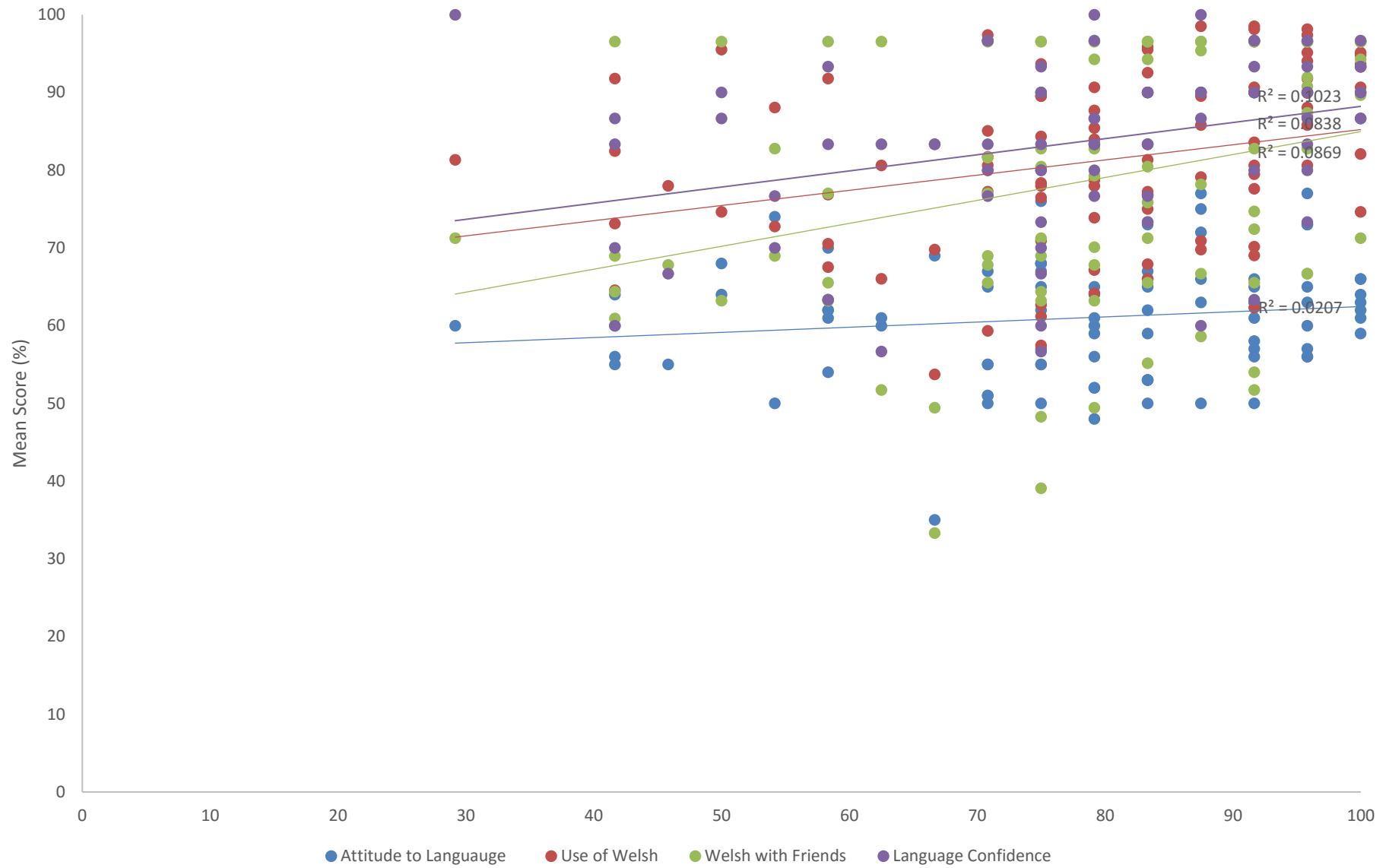


Figure 6.6: Relationship between LIW participants' Welsh Vocabulary scores and their Use of Welsh, Attitude, and Confidence

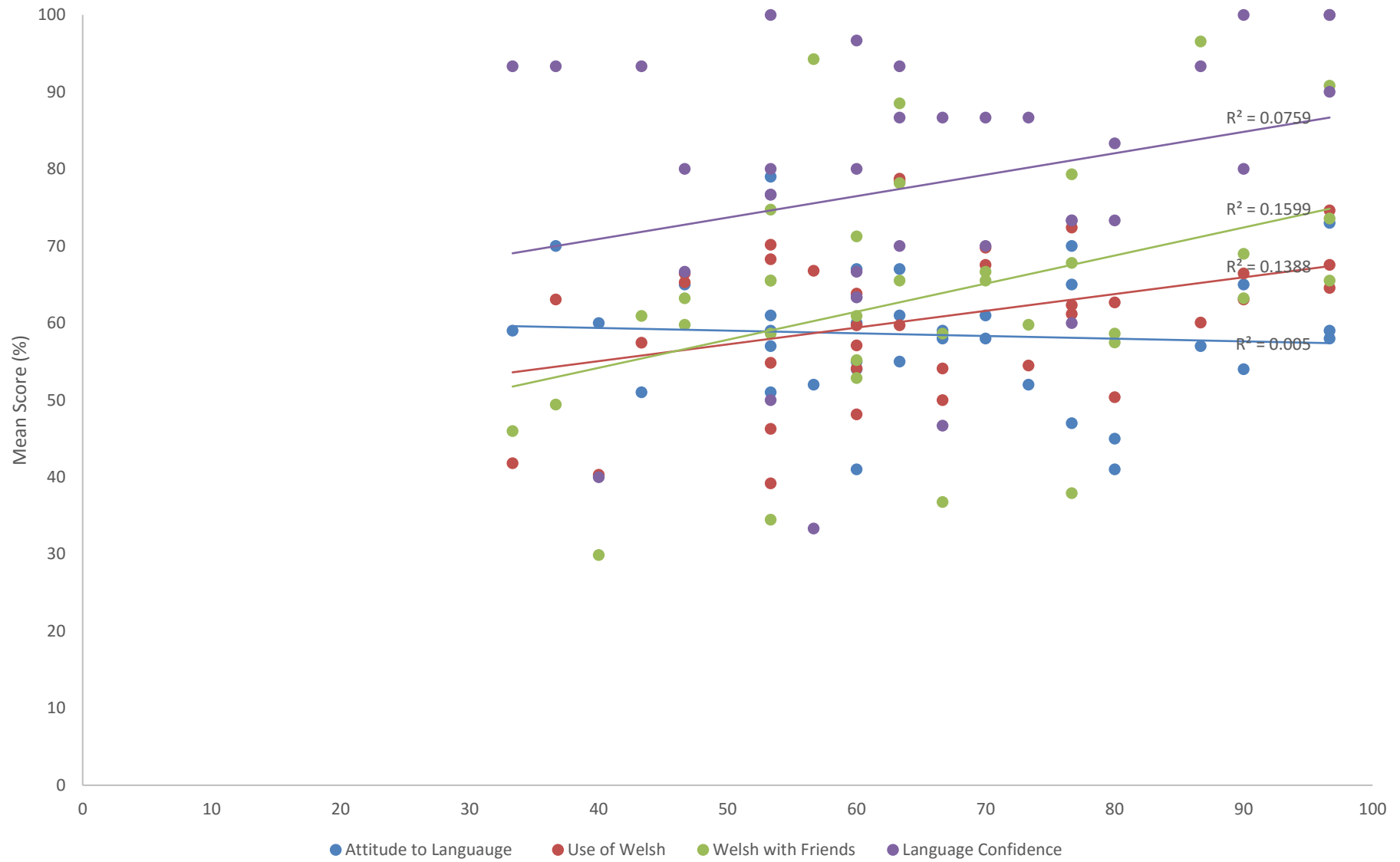


Figure 6.7: Relationship between 2L1 participants' Gender scores and their Use of Welsh, Attitude, and Confidence

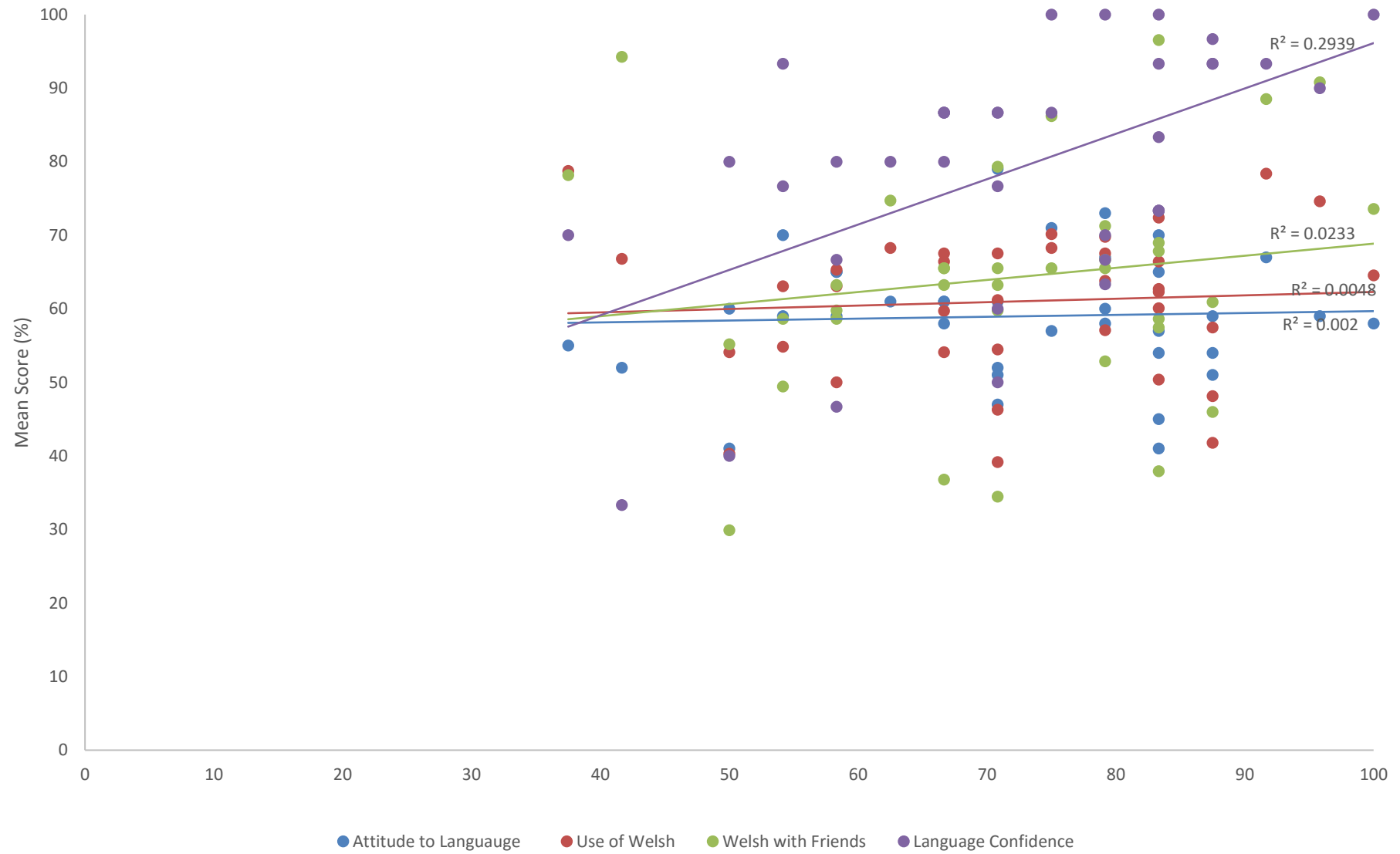


Figure 6.8: Relationship between 2L1 participants' Plural scores and their Use of Welsh, Attitude, and Confidence

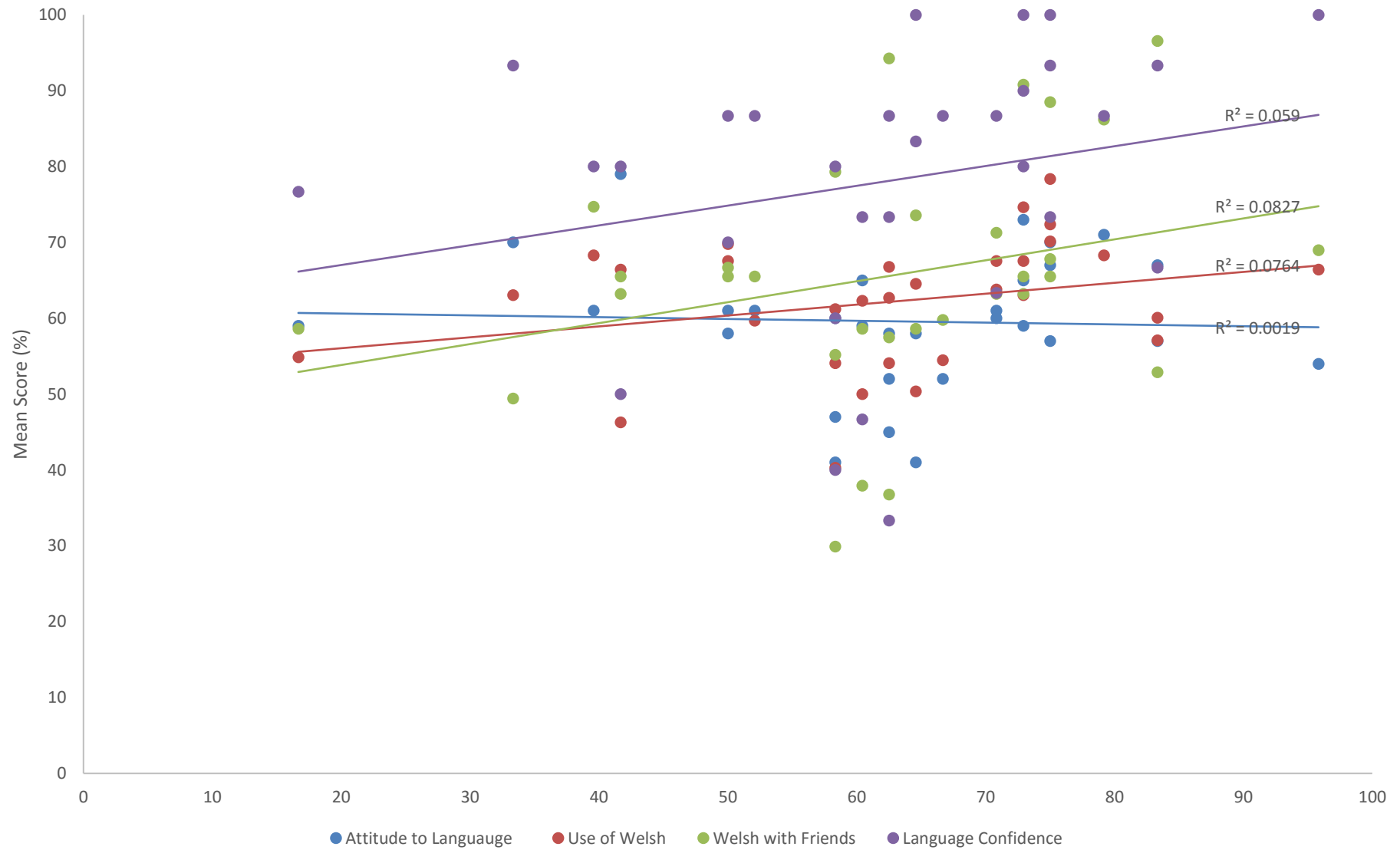


Figure 6.9: Relationship between 2L1 participants' Welsh Vocabulary scores and their Use of Welsh, Attitude, and Confidence

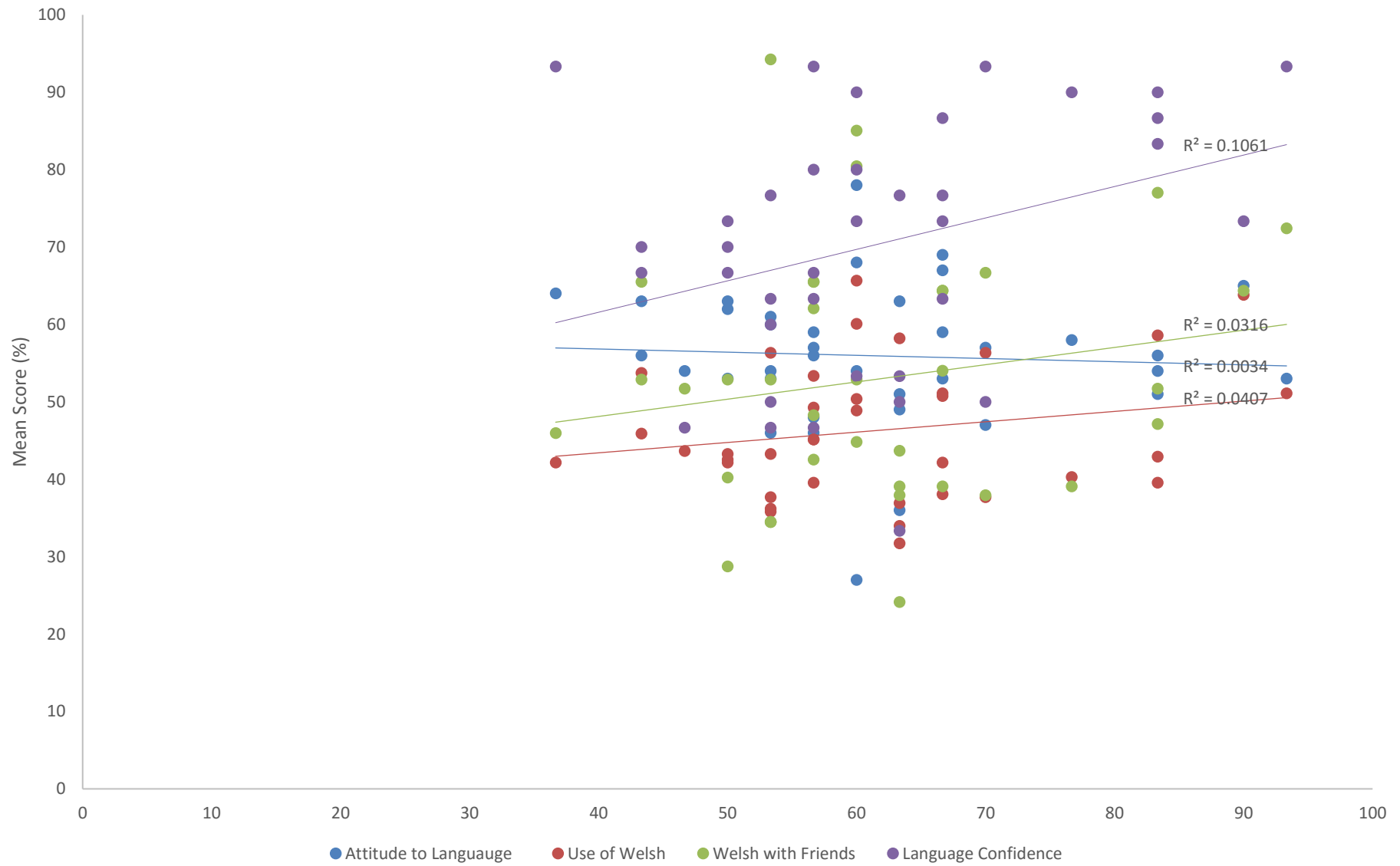


Figure 6.10: Relationship between L2W participants' Gender scores and their Use of Welsh, Attitude, and Confidence

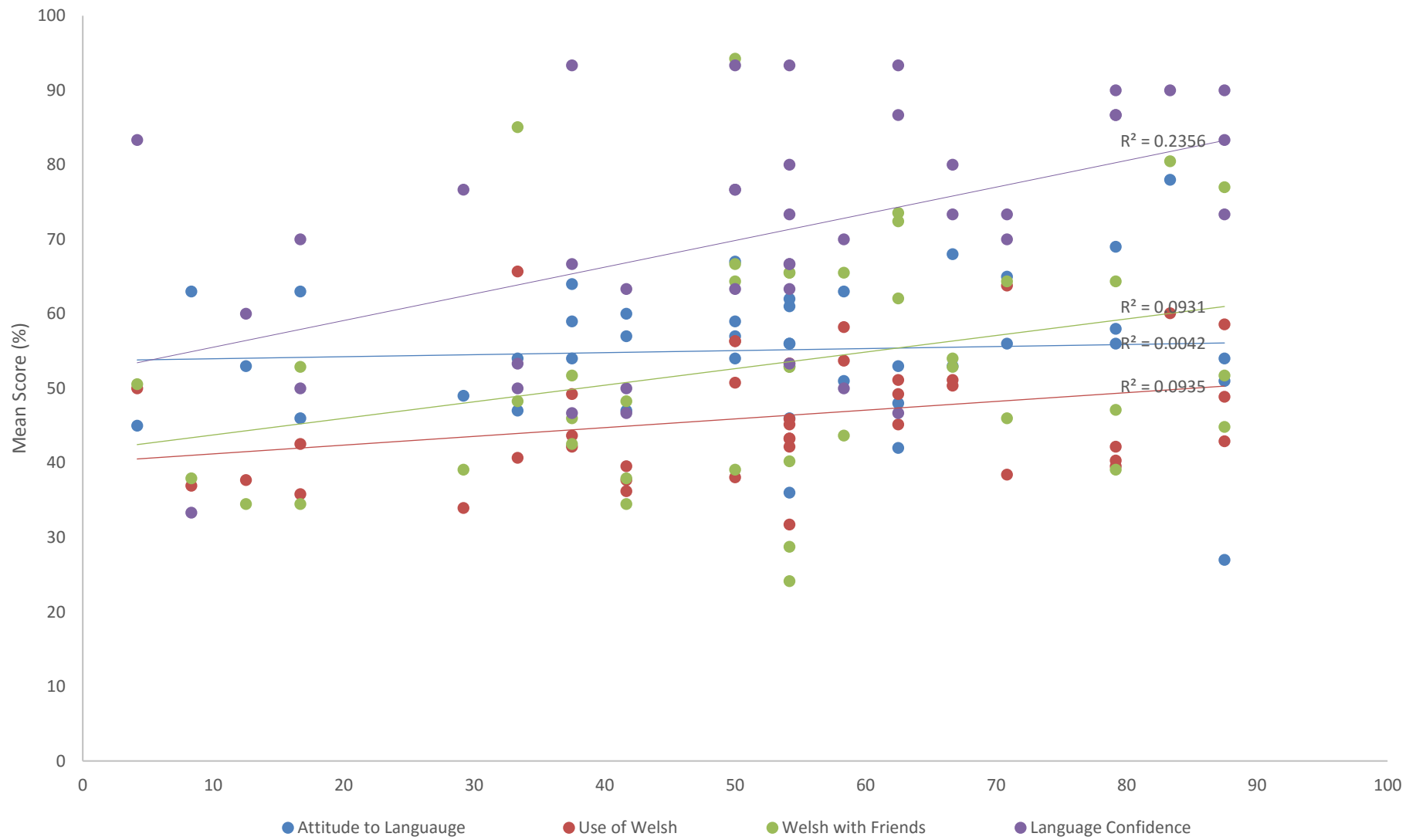


Figure 6.11: Relationship between L2W participants' Plural scores and their Use of Welsh, Attitude, and Confidence

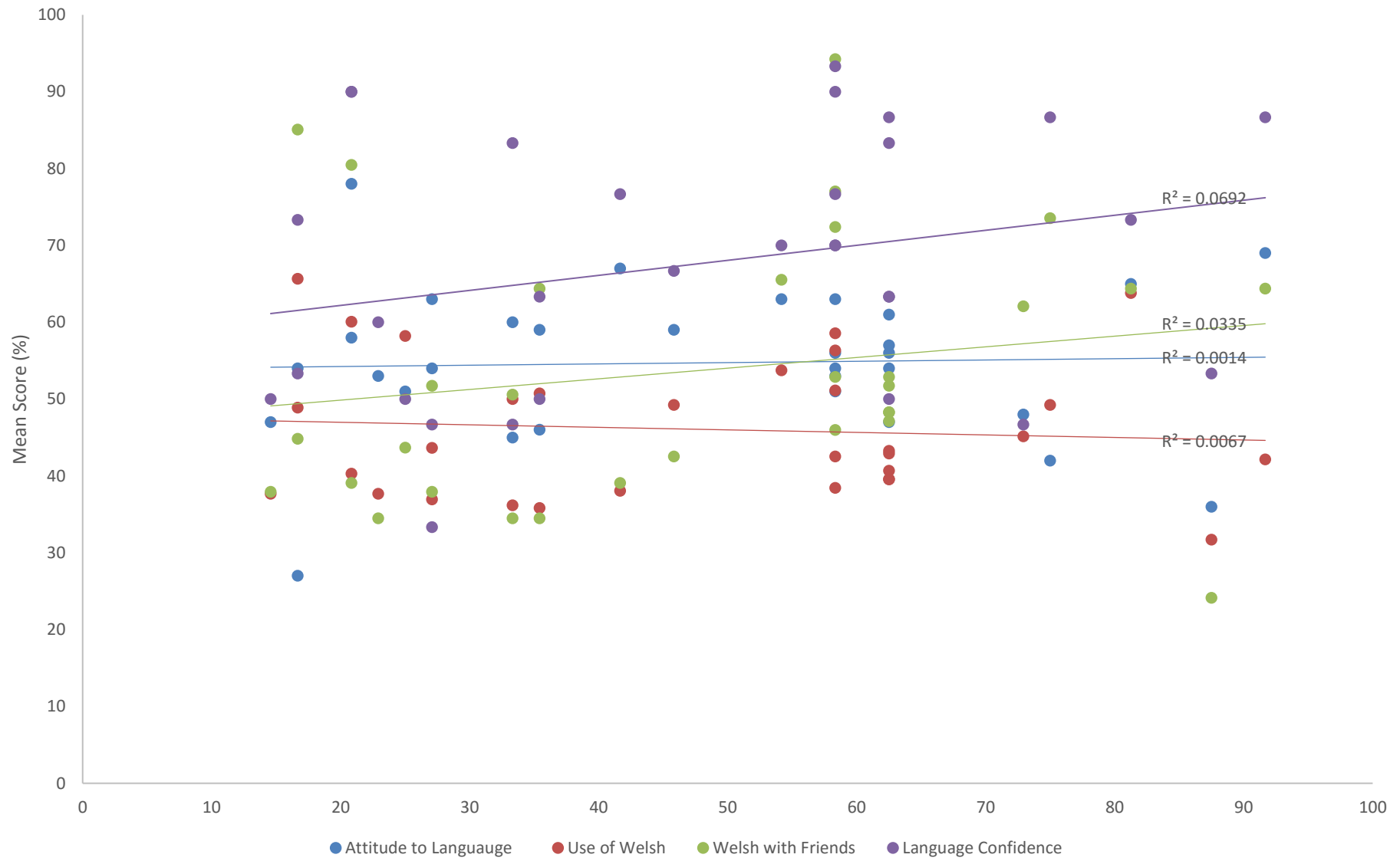


Figure 6.12: Relationship between L2W participants' Welsh Vocabulary scores and their Use of Welsh, Attitude, and Confidence

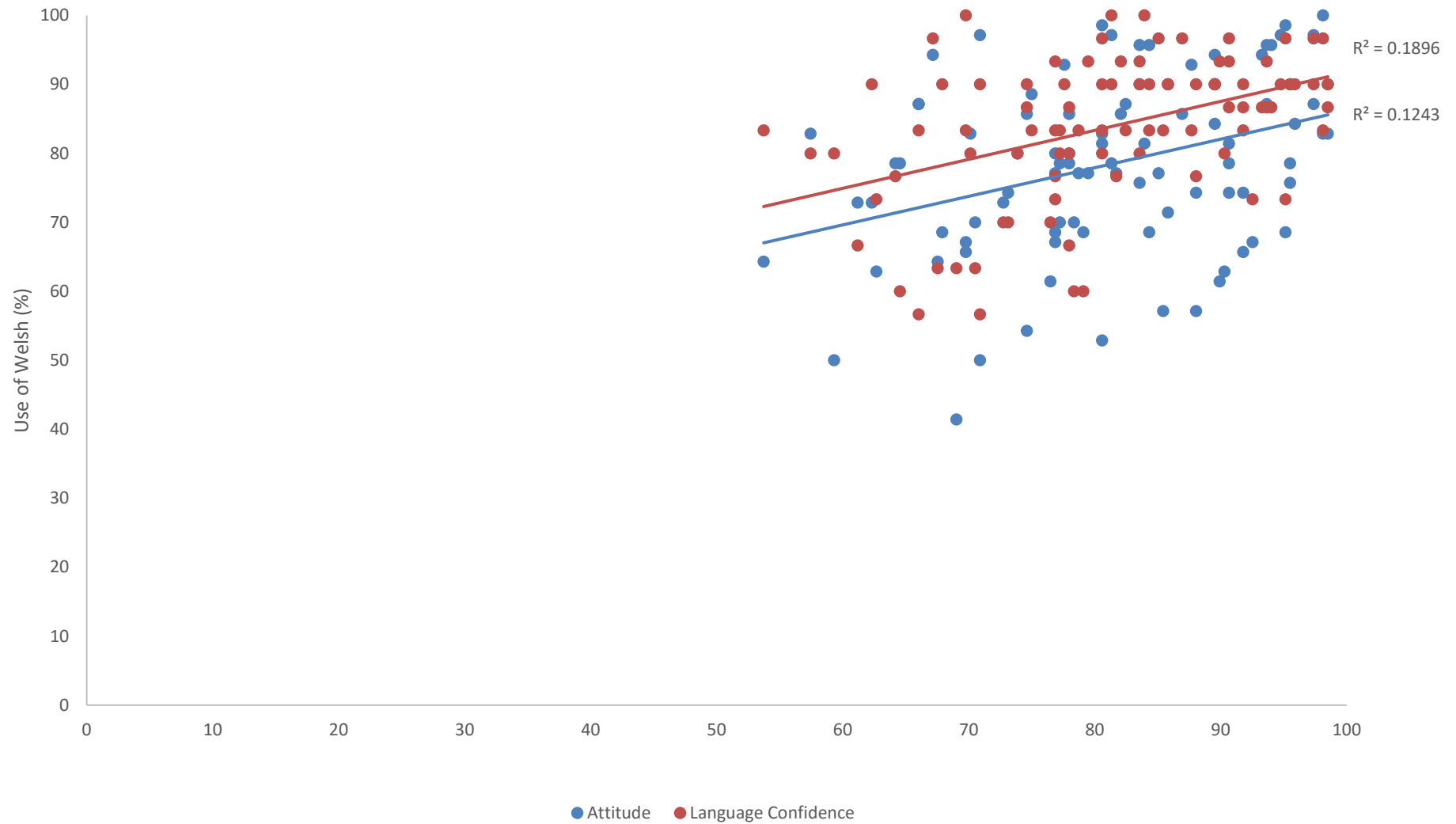


Figure 6.13: Relationship between LIW participants' Use of Welsh and their attitude and confidence

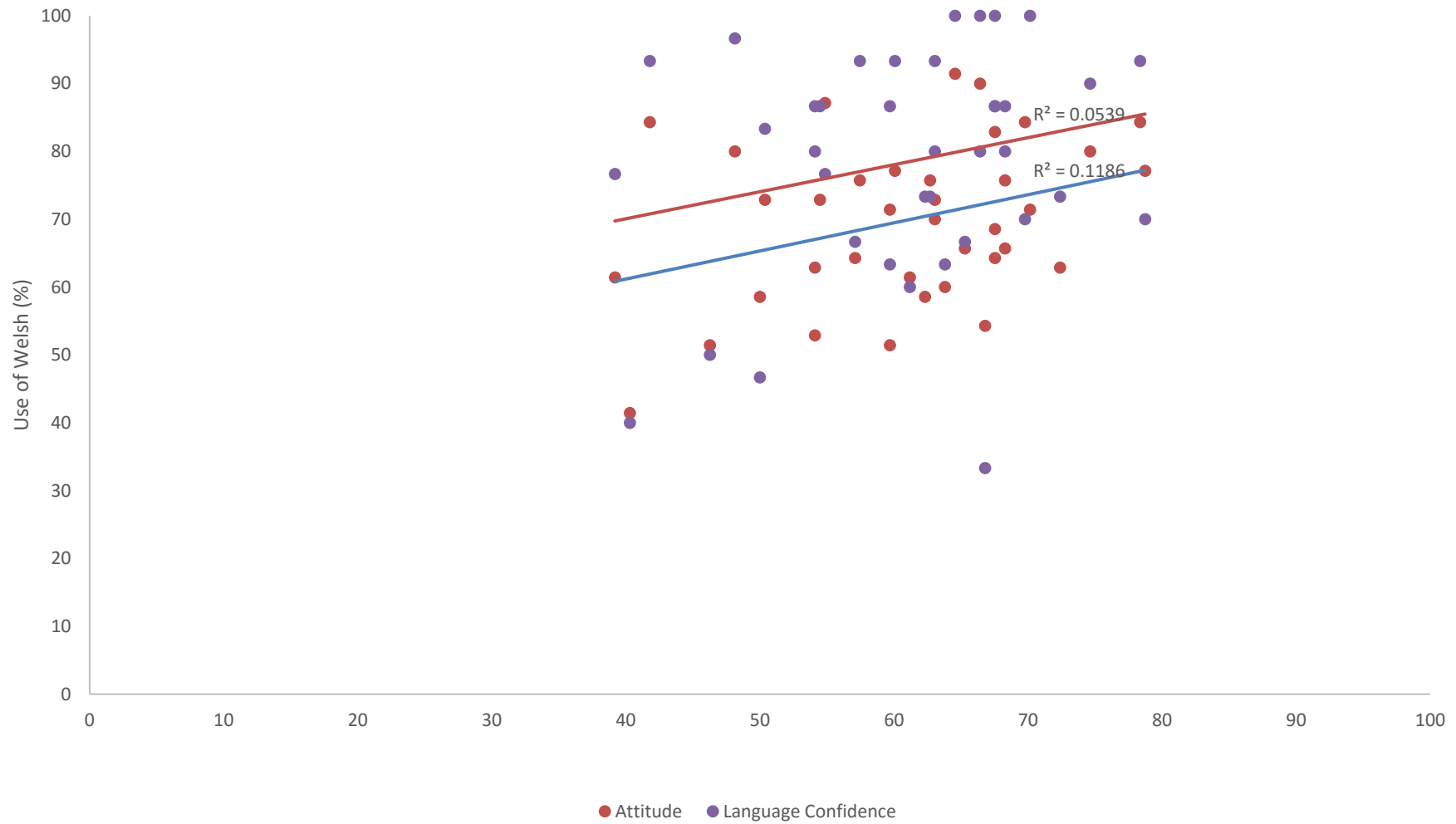


Figure 6.14: Relationship between 2L1 participants' Use of Welsh and their attitude and confidence

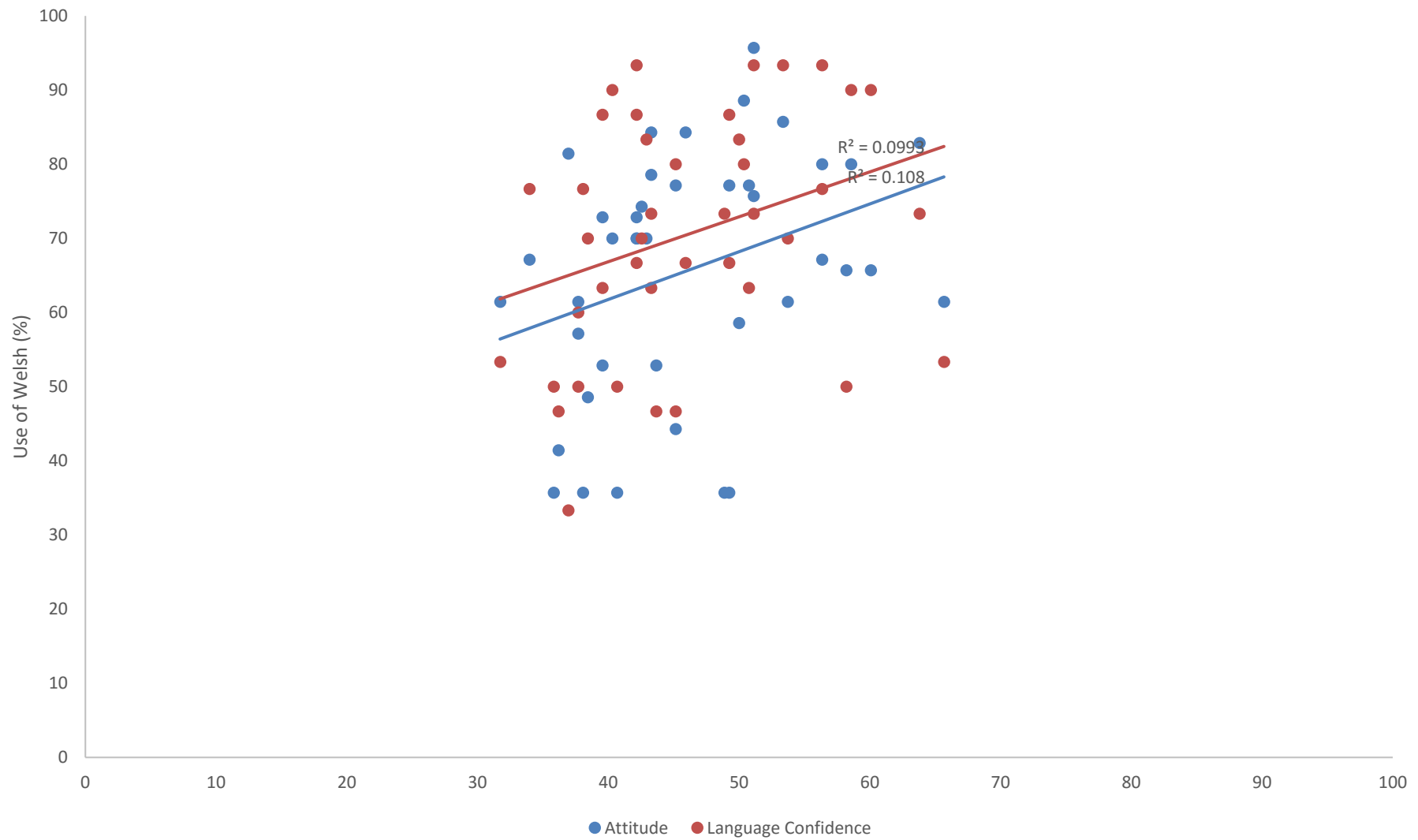


Figure 6.15: Relationship between L2W participants' Use of Welsh and their attitude and confidence