CHAPTER 1

PROBLEM STATEMENT

1.1. Introduction

This chapter presents a brief outline of the study. Firstly a concise problem statement is presented, followed by definitions of relevant and important terms. The chapter concludes with a brief outline of each chapter.

1.2. Problem Statement

Experiencing and expressing emotion lies at the core of being human. It is important for the psychological well-being of individuals that they are able to express the emotions they are experiencing, as well as communicate about these emotions (Johnson, 1997).

Emotional development takes place from birth and continues through primary school and into adulthood; following different stages and forming the foundation of all learning (Greenspan, 2004). In the second half of a typically developing child's first year he is able to show emotion as well as perceive and respond to it. Although emotion is an abstract concept, typically developing children as young as three are with exposure and practise able to infer basic emotions from facial expressions. At age three, typically developing children start to develop the ability to conceptualize and name different emotions (Greenspan, 2004). They are able to express emotions symbolically by using spoken language.

Information about our inner states is often revealed through one or more of five basic channels: facial expressions, eye contact, body movement, posture and touching (Baron & Byrne, 1979). Facial expression of emotions is crucial to the development and regulation of interpersonal relationships (Ekman, 1999a). Some authors regard recognizing basic emotions from facial expressions as a universal phenomenon (Elfenbein & Ambady, 2003; Ekman, 1994; Izard, 1994); while other authors (Boyatizis, Chazan, & Ting, 1993) caution that cultural differences and differences between individuals also play a role and should be taken into account whenever discussing emotions and the facial expressions linked to the emotion.

However, children with little or no functional speech (LNFS) may have some difficulty expressing their emotions for a variety of reasons. A possible strategy to assist these children with LNFS to communicate is an aided strategy in the field of Augmentative and Alternative

Communication (AAC). Many aided strategy refer to the use of graphic symbols to represent the concepts symbolically. Graphic symbols are two dimensional line drawings and can be pictorial or more abstract. Picture Communication Symbols (PCS) is an example of pictorial symbols where the symbols are line drawings with a strong visual link between the objects and concepts being represented and the drawings. The nature of pictorial graphic symbols selected to represent concepts, especially non-picture producers, and whether these pictorial graphic symbols can successfully depict language needs to be continually debated. Research studies over the years have indicated that children (in many instances, but not exclusively typically developing children) relate to graphic symbols differently from the way adults and developers of graphic symbol sets and systems anticipated the children would relate to these graphic symbols (Basson & Alant, 2005; Haupt & Alant, 2002; Moolman & Alant, 1997).

As children with little or no functional speech is such a heterogeneous group initial research in different areas in the field of AAC, use typically developing children as participants. Once researchers have a better understanding of the researched area, their results can be used as the foundation for further research with different and more heterogeneous participants.

In the fields of psychology and anthropology extensive research has been done on how different age and cultural groups interpret different emotions. The material to represent emotions in most of these studies was photographs with a few studies developing line or schematic drawings to represent the emotions (MacDonald & Kirkpatrick, 1996). In pictorial graphic symbol sets emotions are traditionally represented by line drawings of different facial expressions, but little research has been conducted to establish whether children view the graphic symbols depicting emotion the same way adults do. Preliminary results indicate that the available graphic symbols depicting emotions are not always recognized by children as depicting the emotion assigned to the graphic symbol by the developers of these graphic symbol set / systems. A study by Visser, Alant and Harty (2008) found that certain graphic symbols representing emotions may be more difficult for preschoolers to recognize than others.

There is a paucity of knowledge with regard to how, even typically developing, children relate to graphic symbols representing emotions. No known studies are available on how children from different language backgrounds relate to these graphic symbols representing emotions. This study therefore endeavours to determine and compare how typically

developing 5 to 6 year old South African Children from two different indigenous languages namely Afrikaans and Sepedi relate to PCS depicting four basic emotions, i.e. *happy sad, angry* and *afraid*.

1.3. Definition of term:

Basic emotions are the more observable emotions (Baron-Cohen, et al., 1996) and are used to provide explanations for some routine observations about emotions like the fact that some emotions appear to exist in all cultures and that some emotions appear to be universally associated with and recognizable by characteristic facial expressions (Ortony & Turner, 1990). Four basic emotions were used in the current study, i.e. *happy*, *sad*, *angry* and *afraid*. According to development literature these labels for these symbols emerge first.

Emotions are viewed as concepts used by human beings to interpret and organize experience; the conceptual knowledge used to understand and classify emotional experiences is derived from and mirrors actual past experiences (Stein & Trabasso, 1992).

Emotion knowledge is the term referring to children's understanding of emotions (Bennett, Bendersky, & Lewis, 2005; Izard, et al., 2001). Some authors refer to *emotion knowledge* as *emotion understanding* (Cowell & Hart, 2006; Denham, Zoller, Couchoud, 1994) and encompasses emotional expression identification, emotion language and emotion situation knowledge.

Emotion situation knowledge refers to knowledge about situational antecedents of emotions (Wang, 2003) and encompasses the ability to infer other's emotions from situational cues (Fine, Izard, & Trentacosta, 2006). Psychologists have referred to such knowledge as emotional scripts, affective schemata and the link between situations and emotions (Denham, et al., 1994; Wang, 2003).

Expected symbols in this study refer to any of the 4 PCS, on the presented overlay, systematically identified to represent a specific basic emotion. Due to the nature of the task, the selection of an expected symbol should not be considered as more correct than the selection of an unexpected symbol.

Graphic symbols can be defined as a visual symbol that represents a referent to convey a meaning (Lloyd, Fuller, & Arvison, 1997). In this study a g*raphic symbol* is a two-dimensional pictorial representation.

Picture Communication Symbols (PCS) is a large set of aided symbols composed largely of simple pictorial line drawings (Lloyd, et al., 1997). PCS is a limited set with no rules to facilitate possible further expansion of the set.

Preferred symbols can be defined as the particular symbols most of the participants selected to represent the emotions. Preferred symbols can be either expected or unexpected symbols.

Unexpected symbols in this study refer to any PCS on the presented overlay which is not one of the expected symbols of the target emotion.

1.4. Abbreviations

AAC	Augmentative and Alternative Communication
LNFS	Little of no functional speech
PCS	Picture Communication Symbols

1.5. Chapter outline

Chapter 1 briefly presents an introduction to the study as well as the problem statement. It offers an outline of each chapter and explains important terms and abbreviations used throughout the study.

The theoretical background is the focus of *Chapter 2*. Important concepts mentioned in the first chapter are expanded on. These concepts are emotion, basic emotions, emotion knowledge (emotional expression identification, emotion language and emotion situation knowledge) and emotion development. In addition, relevant research on emotion knowledge, development of emotions, perception of emotions, and literature is critically discussed.

Chapter 3 presents the research methodology. The aims of the study are described in detail. The research design, participant selection, participants, material, development of material, pilot study results, data collection procedures, data analysis procedures as well as reliability data for procedural and data collection is presented.

In *Chapter 4* the results obtained in the study are presented in correspondence with the main and sub-aims which was to describe and compare Afrikaans- and Sepedi-speaking grade R children's choice of graphic symbols when depicting four basic emotions: happy, sad, afraid and angry.

Chapter 5 offers a discussion of the results as presented in Chapter 4. Possible reasons for significant differences are discussed as well as possible reasons for the lack of significant differences. The developmental model for emotional development is used as a reference to discuss the results. In addition a discussion of the graphic symbols in terms of facial features is presented.

Chapter 6 integrates the discussed results. The study is critically evaluated and recommendations for further studies are made. The strengths and weaknesses of the study are listed and discussed.

1.6. Summary

This chapter presents the problem statement which gave rise to the execution of the study. The different chapters are outlined and definitions and abbreviations important for the rest of the study are presented.

CHAPTER 2

EMOTION, EMOTIONAL KNOWLEDGE AND GRAPHIC REPRESENTATION OF EMOTIONS

2.1. Introduction

This chapter will discuss literature and research to outline a theoretical foundation for the current study. Firstly the construct of emotion will be discussed. This discussion will look at the definition of basic emotions, the development of emotions in typically developing children and emotion knowledge. Secondly both international and South African studies on aided communication will be discussed. The final section will focus the aspect of visual perception of emotions depicted by graphic symbols. Possible gaps in the literature will be identified and discussed with regard to how the current study proposes to address these gaps.

2.2. The construct of emotion

Emotion is a difficult construct to define and the exact definition differs widely among researchers (Kang & Shaver, 2004). Differential emotions theory defines emotion as a complex concept or process with neurophysiological, neuromuscular and phemenological aspects (Izard 1971; 1977). Ben-Ze'ev (2000) defines emotions as highly complex and subtle phenomena whose explanation requires careful and systematic analysis of their multiple characteristics and components. Emotions are viewed as concepts used by human beings to interpret and organize experience; the conceptual knowledge used to understand and classify emotional experiences is derived from and mirrors actual past experiences and leads to interpretations which are shared across persons and is used to interpret and evaluate situations as well as constrain which emotions are felt (Stein & Trabasso, 1992).

In essence emotions arise when events or a notable change in a person's world occur which is important for a person's wellbeing (Calvo & Marrero, 2009; Denham, 1998). These events or changes can be caused by antecedents like environmental events, actions by the individual himself, by actions of others or even memories (Denham. 1998). Emotions are the regulators of behaviour within oneself (intrapersonal) and in interactions with others (interpersonal) during the occurrence of these life changing events (Denham, 1998).

Although researchers differ about exactly which, how many and why emotions are basic; the notion of basic emotions are widely accepted (Brown & Dunn, 1996; Denham & Couchoud, 1990a; Ekman, et al., 1987; Ortony & Turner, 1990; Widen & Russell, 2004). Ortony and Turner (1990) pointed to the fact that almost all authors who postulate basic emotions include anger, happiness, sadness and fear. The most common reason for proposing basic emotions is to provide explanations for some routine observations about emotions like the fact that some emotions appear to exist in all cultures and that some emotions appear to be universally associated with and recognizable by characteristic facial expressions (Ortony & Turner, 1990).

In Ekman's (1999b) discussion on basic emotions, he mentions the concept of emotion families. This concept might help to clear away some of the confusion and the argument about how many emotions there are, as according to Ekman (1999b) each emotion is not a single effective state, but a family of related states, sharing characteristics. Ekman (1999b) distinguishes between different emotional phenomena namely emotions, emotional plots, moods and affective personality traits and does not allow for "non-basic" emotions. Accordingly he sees all emotions as basic and the basic emotions framework as allowing emotions to be distinguished from the other mentioned emotional phenomena (Ekman, 1999b).

Different authors choose to classify or describe emotions in different ways in terms of either categories of dimensions (Denham & Couchoud, 1990b; Izard, 1971; Russell, 1980; Russell & Bullock, 1986). Izard (1971) mentioned the existence of three dimensions to describe emotions. These dimensions are pleasantness-unpleasantness, relaxation-tension and calm-excitement (Izard, 1971). According to Russell and Bullock (1986) expressions can be interpreted in such basic categories as anger, fear, happiness, surprise etc. Expressions can further also be interpreted in terms of basic bipolar dimensions as pleasure-displeasure and arousal-sleepiness (Russell & Bullock, 1986). Emotions in the arousal dimension will be experience as emotions with high intensity (anger and fear), while emotions in the sleepiness dimension will cause a less intense experience. According to Russell (1980) feeling states can be plotted in a circular order around the perimeter of this two-dimensional space, the axes of which are pleasure-displeasure (x-axis) and arousal-sleepiness (y-axis). Evidence from Russell and Bullock (1986) suggest that happiness lies in the pleasure and arousal quadrant;

sadness in the displeasure and sleepiness quadrant with fear and anger both in the displeasure and arousal quadrant.

Denham and Couchoud (1990b) classify emotions in two categories either as positive (happiness) or negative (sadness, anger, fear) emotions. Russell and Bullock (1986) suggest that to distinguish categories from dimensions does not set them up as mutually exclusive possibilities. In fact, these authors feel that categories and dimensions may be necessary to account for different aspects of children's behaviour. When combining categories and dimensions happiness can be classified is a positive emotion with high intensity; sadness a negative emotion with low intensity and fear and anger negative emotions with higher intensity than sadness (Russell & Bullock, 1986).

2.3. Development of emotions in children

Human infants are born into a social-filled world of a diverse and ever-changing flow of emotional information from others' faces and voices (Moses, Baldwin, Rosickly, & Tidball, 2001) and children's emotional development forms the foundation of all learning (Greenspan, 2004). The ability to decode facial emotions is a nonverbal skill and plays a critical role in social and emotional development (Boyatzis, et al., 1993, Izard, 1971).

A study by Barrera and Maurer (1981) found that infants as young as three months old are able the discriminate between happy (smiling) and angry (frowning) expressions, not only when posed by the mother, but also when posed by a female stranger. Children's ability to decode facial expressions improves with age up to and during preschool and early elementary school years (Boyatzis, et al., 1993; Camras & Allison, 1985).

In the second half of a child's first year, the child is able to show, perceive and respond to emotion and between 12 and 15 months children can discriminate among basic emotions (Greenspan, 2004). By 15 months children become aware that different emotions can coexist (Greenspan, 2004) and are they able to forge emotional bonds across space and later across time. According to Greenspan (2004) children from about three years old develop the ability to abstract an emotion and to name it and at age 4 a child is able to link ideas with emotions (Greenspan, 2004).

Childhood presents a number of landmarks (Widen, & Russell, 2008a), including the child's first word or the first use of a particular word. According to Widen and Russell (2008a) these landmarks are often use to chart development, as when a child first use the word *scared* it is thought mark the acquisition of fear. Results from studies by Russell and colleagues (Russell & Paris, 1994; Widen, & Russell, 2003; Widen, & Russell, 2008a) suggest that emotion concepts are initially broad, from including anything from the same valence and narrowing gradually over a period of years, thus the use of a label for the first time might be a discreet event, but the acquisition of the emotion is quite gradual.

In 2003 Widen and Russell proposed the Differentiation Model to describe children's acquisition of emotion concepts. The Differentiation Model is presented in Figure 1.1. According to this model children initially interpret facial expressions and emotions in terms of broad dimensions of comfort-discomfort and intensity (Widen & Russell, 2003) or differently termed displeasure-pleasure dimensions and degree of arousal (Widen & Russell, 2008a). According to them the next level of performance is the use of one label, usually *happy* at the age about 35.4 months. At this stage *happy* may perhaps mean something broad such as 'excited' or even 'emotional'. The next level at age about 35.7 months is the use of two labels (Widen & Russell, 2003), one positive emotion (*happy*) and one negative emotion, either *sad* or *angry*. The next level is the use of three labels with a division in the negative emotions (*sad* and *angry) (41.2 months)*. At this stage these three labels are still applied broadly, with happy still meaning positive, while *angry* is a negative emotion with high arousal and *sad* a negative emotion with low arousal. Finally the words *surprised, scared* and *disgusted* are added to the child's lexicon.

The Differentiation Model proposed in 2003 (Widen & Russell) was developed using a free-labelling task, where participants were asked to label five facial expressions and separately five stories of emotional events. Results led Widen and Russell (2003) to believe that *surprised, scared* and *disgusted* labels are applied more narrowly from the beginning (Widen and Russell, 2003). In a study published in 2008 (Widen & Russell, 2008a) replicated the free-labelling of facial expression and included a categorization task. Results of both tasks support their work published in 2003 (Widen & Russell). On the categorisation task, children's later-emerging emotion category (fear and presumably other later-emerging categories) was as broad as their early-emerging ones (happiness, sadness, anger). On this result the Model was amended indicating that the four emotions are equally broad and that

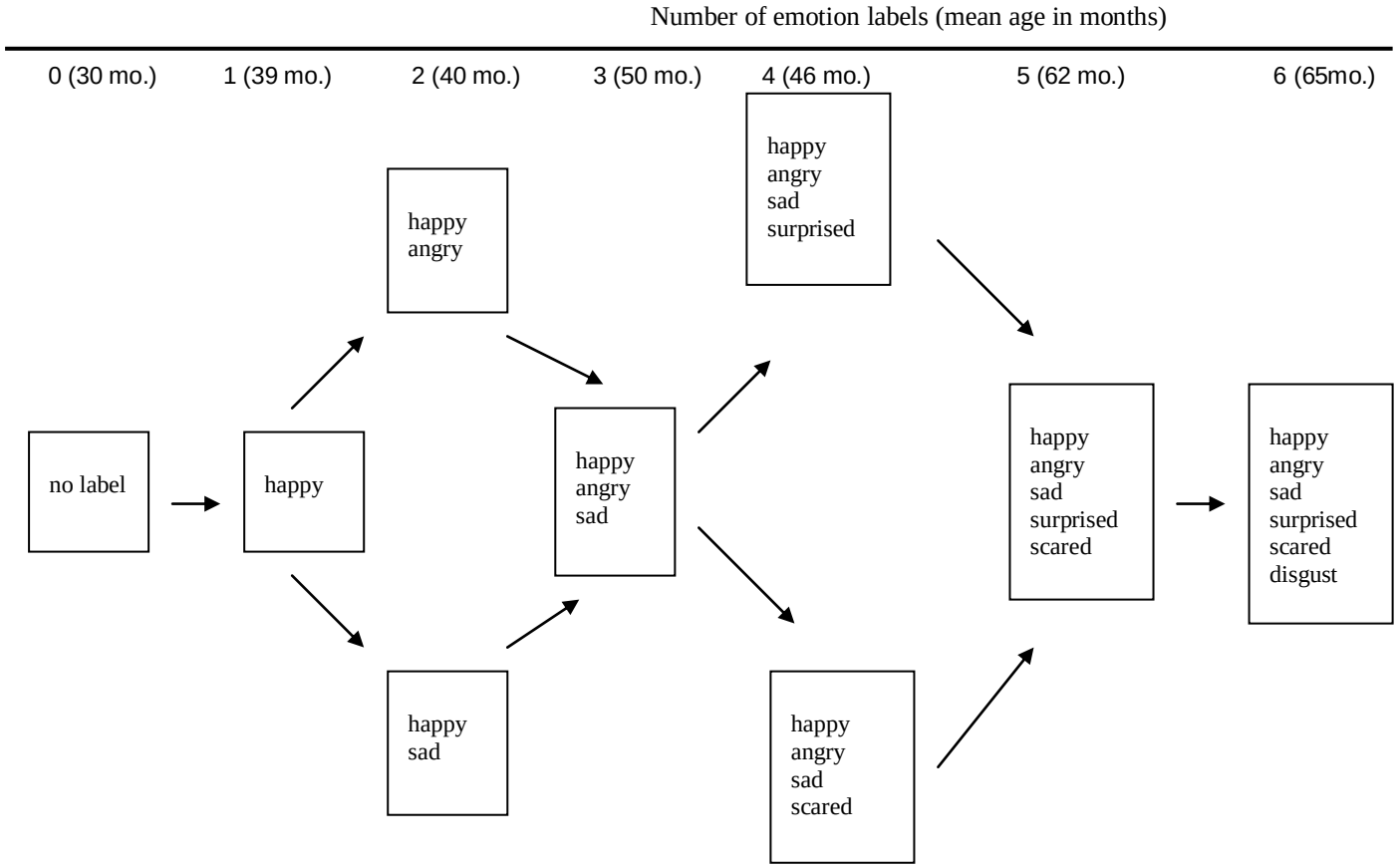

Figure 1.1 Systematic emergence of emotion labels (Widen & Russell, 2003)

later-emerging categories may have appeared to be to narrower in free labelling, as label accessibility plays a role on this task (Widen & Russell, 2008a).

Widen and Russell (2008a) concluded that the first observed use of an emotion label on free labelling is just one step along the way to understanding an emotion concept and that children's understanding of an emotion label can be different from adults', even when they use the same labels, thus suggesting that label acquisition is but one step in a years-long process toward the understanding of emotions in an adult-like manner.

The Differentiation Model gives a foundation as to the approximate age children are able to label and categorise emotions. The authors mention that children initially interpret facial expressions and emotions in terms of broad dimensions and that their understanding could be different from adults'. The model unfortunately is not able to give a possible timeline as to at which approximate age children start to understand the emotion concepts in an adult manner.

2.4. Emotional knowledge

According to Mayer and Salovey (1990) emotional intelligence can be defined as the capacity to process emotional information accurately and effectively. This includes information relevant to the recognition, construction and regulation of emotion in oneself and others and is recognised as powerful intra- and interpersonal regulators of behaviours (Denham, McKinley, Couchoud, & Holt, 1990). Children's emotional understanding (Cutting & Dunn, 1999; Denham, 1986) also called emotion knowledge (Izard, et al., 2001) is very important for their functioning in multiple contexts (Cowell & Hart, 2006) and can be defined as a child's understanding of emotions (Bennett, et al., 2005; Izard, et al., 2001). For children to gain knowledge and understanding of emotions, they need to experience emotions in social situations. According to Cowell & Hart (2006) children will take this knowledge with them into their own social interactions and relationships and thus a child's interpretation of a situation will be influenced by past experiences.

Emotion knowledge has different components (Bennett, et al., 2005; Cutting & Dunn, 1999; Denham, et al., 1990; Denham, Zoller, & Couchoud, 1994; Fine, et al., 2006; Garner,

Dunsmore, & Southam-Gerrow, 2008; Wang, 2003): emotional expression identification, emotion language and emotion situation knowledge. These components are tested using different tasks.

Emotional expression identification (Denham, et al., 1990) is tested using emotion recognition and labeling tasks (Bennett, et al., 2005; Cowell & Hart, 2006). The emotion recognition task is a non-verbal task (use receptive verbal skills) where the participant is asked to identify a facial expression when given the label by pointing to a photograph or picture depicting facial expressions of emotions (Bennett, et al., 2005; Cowell & Hart, 2006; Denham, Mitchell-Copeland, Sandberg, Auerbach, & Blair, 1997). With emotion labeling or affective labeling the participant must verbally (use expressive verbal skills) produce a label for emotion expressions presented to him/her (Denham, 1986; Cowell & Hart, 2006).

Emotion language is tested when the participant is asked to explain certain emotions or give reasons as to why someone would feel a specific emotion (Denham, et al., 1994). Emotion situation knowledge (Denham, et al., 1990; Fine, et al., 2006; Garner, et al., 2008) also known affective perspective taking (Cutting & Dunn, 1999; Dunn, Slomkowasi, & Youngblade, 1991) encompasses the ability to infer other's emotions from situational cues (Fine, et al., 2006). To test emotion situation knowledge the participant listens to equivocal (stories where the story character in the situation would feel a different emotion than the participant would) and unequivocal (stories where the story character in the situation would feel the same emotion than the participant would) vignettes describing an emotion situation and then has to indicate which emotion he/she thinks the character in the story would feel (Cutting & Dunn, 1999; Denham, et al., 1990; Dunn, et al., 1991; Fine, et al., 2006; Garner, et al., 2008).

Studies exploring young children's emotion knowledge usually explore the components emotion situation knowledge (Fine, et al., 2006; Garner, et al., 2008; Wang, 2003) and emotion expression identification (Izard, et al., 2001) either separately or in combination (Bennett, et al., 2005; Colwell & Hart, 2006; Cutting & Dunn, 1999; Denham, 1986; Denham, et al., 1990; Denham et al., 1994; Denham, et al., 1997; Dunn, et al., 1991). Few studies explore emotion language (Denham, et al., 1994). Different antecedents like young children's cognitive ability, maternal verbal intelligence, environmental risk (Bennett, et al.,

2005), age (Denham & Couchoud, 1990a) and cultural background (Wang, 2001, 2003) can influence children's emotion knowledge.

In a study by Wang (2003), he looked at 3- and 6-year old American and Chinese children's emotion situation knowledge. The participants were asked to identify in 20 short stories the emotion of a protagonist of their own age, gender and ethnicity. The children had to select among faces of happy, sad, fearful and angry (Wang, 2003). The participants then used a specially designed scale to rate the intensity of the emotion felt (Wang, 2003). Adults (the children's mothers and other adults) of the same ethnicity answered a questionnaire with the same questions.

Wang (2001, 2003) found cultural differences within emotion situation knowledge development. In a comparative study between American and Chinese preschool children and adults results indicated that the degree of mastery of knowledge about the appropriate emotions in particular situations varied between the two cultures (Wang, 2003). Results indicated that American children showed an overall greater understanding of emotion situation knowledge than their Chinese peers and this was shown especially for the negative emotions (Wang, 2003). These cultural differences emerged regardless of the type of judgment standard (the responses provided by the children's own mothers, by the majority of mothers or by the majority of a second group of adults in the respective cultures) employed. The American children's understanding of emotions further improved more rapidly than their Chinese peers' understanding, in particular for fear and anger (Wang, 2003).

American children and adults gave higher intensity ratings to the protagonists' feeling states than did Chinese participants. Participants from the two cultures perceived different emotions within specific situations (Wang, 2003). This study presents an addition to literature on children's development of emotion understanding as well as the impact of early cultural-familial context within which such development takes place (Wang, 2003). These cultural differences are closely associated with the different socialization practices of the two cultures exemplified in an earlier study investigating American and Chinese mother-child conversations about shared emotional experiences (Wang, 2001, 2003).

In the 2001 study mothers were instructed to discuss with their children four specific one-point-in-time events they shared with their children and in which the child experienced

happiness, sadness, fear or anger. These conversations took place at home and were tape-recorded by the mothers. Results indicated that American mothers used an "emotion-explaining" style where they spoke frequently about the situational antecedents of feeling states, providing elaborate explanations as to how and why an emotional reaction occurred (Wang 2001). In contrast Chinese mothers employed an "emotion-criticizing" style with little discussion about antecedents, but rather moral judgments about the incorrectness of children's emotional experience or behavior (Wang, 2001).

Results of the above studies (Wang, 2001; 2003) indicated that children at the age of three had already internalized their mothers' styles in discussing shared pasts; American children would frequently talk about causes of emotions while Chinese children often gave spontaneous comments on social rules and disciplines.

According to Wang (2003) the "emotion-explaining" style of American mother-child conversations highlighted the personal importance of emotion and facilitated the development of the children's emotion understanding, where as the "emotion-criticizing" style observed in Chinese mother-child conversations put social constraints on children's emotions and committed the children to behavioral standards rather than helping them to develop emotion knowledge. These results establish the effect of an individual-focused (where talking about emotions is regarded as a direct expression of the self and an affirmation of the importance of the individual) versus a group-oriented (where a premium is put on social harmony and group interests) approach to emotion socialization on the development of emotion situation knowledge (Wang, 2001; Wang, 2003). This individualism-collectivism (IC) construct can help to explain and predict cultural differences (Fischer, et al., 2009).

A strength of Wang's (2003) study was the employment of a judgment standard to which the participants' results were compared. For each cultural group there were three judgment standards, i.e. each participant's own mother, the mothers as a group and a group of adults from the same culture. The judgment standard was successfully used in interpreting the results.

The intensity component of emotion situation knowledge is also sensitive to cultural influences (Wang, 2003) with American adults and children giving higher intensity ratings than their Chinese counterparts, especially for negative emotions. The higher intensity

ratings by the American adults and children might reflect on the great value American culture places on emotion in maintaining one's unique individuality, while the lower intensity ratings and the greater difference between positive and negative emotions among the Chinese could reflect the view that negative emotions are potentially disruptive to social relations (Wang, 2003).

2.5. Studies on visual perception of emotions

Several studies during the last three decades have looked at different influences on the visual perception of emotions. Some studies on emotions have looked into young (pre-school) typically developing children and their recognition of emotions (Boyatzis, et al., 1993; Denham & Couchoud, 1990a, 1990b; MacDonald & Kirkpatrick, 1996; Walden & Field, 1982; Widen & Russell, 2003, 2004). Most of these studies made use of photographs as stimuli (Boyatzis, et al., 1993; MacDonald & Kirkpatrick, 1996; Walden & Field, 1982; Widen & Russell, 2003, 2004).

In the study by Boyatzis, et al. (1993), participants were shown a spread of three emotion photographs. They were told a vignette corresponding with one of the photographs. The other two photographs were randomly selected from the remaining five photographs on each trial for each child. After the child heard the vignette, the photographs were spread before him/her and the participant had to point to the photograph showing how he/she thought the character felt in the vignette. Results indicated that the ability to decode facial emotions improved with age for both boys and girls. Girls were found to be significantly better than boys at identifying emotions.

In a study by Widen and Russell (2003) participants were shown pictures of the emotions; they were asked to label each photograph. Results indicated that children's use of emotion labels increased with age in a systematic order. In another study by Widen and Russell (2004) they investigated the relative power of an emotion's facial expression, label and behavioral consequence to evoke participants' knowledge of its cause. Results indicated that though it is assumed that facial expressions are a strong cue to another's emotions, the facial expression was for no emotion the strongest cue (Widen & Russell, 2004).

A study by MacDonald and Kirkpatrick (1996) used photographs and schematic drawings of facial expressions as stimuli in their study. The participants were shown drawings and photographs of emotions (anger, disgust, fear, happiness, sadness, and surprise) in two context conditions. A within subject design including 3 tasks were used in this study. Results indicated that accuracy was the greatest for happiness, followed by sadness, anger, disgust, fear, and surprise. The findings further showed that the accuracy of the interpretation of facial expressions for schematic drawings was significantly greater than the accuracy for photographs (MacDonald & Kirkpatrick, 1996). These findings oppose an AAC study done by Mirenda and Locke (1989) where a predictable hierarchy of symbol transparency was established. According to this study photographs were easier to identify than different graphic symbols including PCS (schematic drawings).

In their study Denham and Couchoud (1990a) used felt puppets as part of what they called a contextually valid measure to investigate young preschoolers' understanding of emotions. Results indicated that the effects of age were significant for both the naming and pointing tasks they used. The measure was seen as contextually valid as children were familiar with the use of felt puppets. Older participants' scores were higher than younger participants' scores (Denham & Couchoud, 1990a).

In the field of psychology, a number of cross-cultural studies can be found done on the universality of emotions (Beaupré & Hess, 2005; Shioiri, Someya, Helmeste, & Tang, 1999; Yik, & Russell, 1999), indicating evidence of cross-cultural agreement in the judgement of facial expression (Ekman, et al., 1987). Consensus exists that the recognition of the emotions of happiness, sadness, surprise, disgust, anger, and fear are universal, although culturally dependent variations in the normal population might occur (Ekman, et al., 1987; Shioiri, et al, 1999).

Previously cited studies referred to typically developing children, but studies have also looked at different populations with regard to different barriers to learning (Bauminger, Edelstein, & Morash, 2005; Celani, Battacchi, & Arcidiacono, 1999; Dawson, Carver, Meltzoff, Panagiotides, McPartland, & Webb, 2002; Dawson, Webb, Carver, Panagiotides, & McPartland, 2004; Holder & Kirkpatrick, 2001; Manassis & Young, 2000). Bauminger, et al. (2005) looked at social information processing and emotional understanding in children with

learning disabilities. Two of several measures used in their study looked at emotional recognition from stories and from pictures. Results indicated (Bauminger, et al., 2005) that in both these cases, children with learning disabilities demonstrated lower performance than children without learning disabilities. Further analysis indicated that for all emotions except happiness, children with learning disabilities performed lower than the group without learning disabilities.

Holder and Kirkpatrick (2001) investigated the accuracy and time required for children with and without learning disabilities to interpret emotions when restricted to information from facial expressions and photographs. Results indicated that children with learning disabilities to be less accurate interpreters of emotion and that they spend more time identifying certain emotions (Holder & Kirkpatrick, 2001).

Manassis and Young (2000) examined differences in the ability to perceive others' emotions in anxious and learning disabilities children. Participants were divided into four groups: children with either anxiety disorders, language-based learning disabilities, both conditions and neither of the conditions. Results indicated that anxiety disorders and learning disabilities each appeared to have distinct effects on the auditory perception of other's emotions. The authors (Manassis & Young, 2000) recommend replication using larger samples.

Celani, et al. (1999) compared three groups of subjects (individuals with autism, individuals with Down Syndrome and typically developing individuals) on a delayed matching task and a sorting-by-preference task. Results indicated that there was a significant difference on the facial expression condition between the autistic experimental group and both the diagnostic normal control groups, due to worse performance of autistic subjects than children with normal development and individuals with Down Syndrome (Celani, et al., 1999).

The mentioned study by MacDonald and Kirkpatrick (1996) used drawings designed to consist of different facial components for emotional expression based on Ekman and Friesen's (1975) evaluations. MacDonald and Kirkpatrick (1996) felt that the richness of detail (gender, ethnicity or even specific features of the photographed model) in facial photographs may have a negative influence on the comprehension and interpretation by young children. This study illustrate the difference in the visual perception of graphic

symbols representing emotions and facial expression of emotions and therefore the importance of studying existing graphic symbol sets and systems' representation of emotions.

2.6. Graphic symbols depicting basic emotions

The field of AAC per definition focuses on visual strategies that enhance the communication of an individual with LNFS. This supplementation of natural speech and/or writing has allowed many individuals, whose disabilities hindered them from communicating, through the traditional means (speech) to more fully realize their potential (Lloyd, Fuller, & Arvidson, 1997).

As these visual strategies play such an important role; research on how children interpret and use graphic symbols remains topical. Since 1985 several studies on issues relating to aided communication have been published in the AAC journal (Zangari, Lloyd, & Vicker, 1990). Studies focused on different aspects of symbol sets and/or systems including: iconicity (e.g., Bloomberg, Karlan, & Lloyd, 1990; Luftig & Bersani, 1985; Mirenda & Locke, 1989; Mizuko & Reichle, 1989; Musselwhite & Ruscello, 1984); representativeness (e.g., Fuller & Stratton, 1991) and component complexity (e.g., Luftig & Bersani, 1985). Some studies also looked into the learnability of these sets and/or systems, including recall and different teaching strategies (e.g. Hertzoni & Lloyd, 2000; Mizuko & Reichle, 1989; Schlosser & Lloyd, 1993).

Iconicity refers to the visual relationship between a symbol and its referent and includes transparency and translucency (Fuller & Lloyd, 1991; Blischak, Lloyd & Fuller, 1997), while the absence of iconicity is called opaqueness (Fuller & Lloyd, 1997). Transparency is used to describe the guessability of a symbol in the absence of its referent, while translucency refers to the degree to which individuals perceive a relationship between a symbol and its referent when the referent is known (Blischak, et al, 1997).

Earlier studies investigating iconicity were conducted in Western cultures and few cross culture studies are available. In a study by Huer (2000) participants were all residing in the Los Angeles area of California; the European-American and African-American participants were all born in the United States and graduated from United States high schools. The Chinese-American and Mexican-American participants were all born and schooled in their native country; unfortunately the time they have been living in the United States were not

mentioned, and thus their exposure and degree of acculturation to Western Culture is unknown.

The results of this preliminary investigation suggest that culture/ethnicity might have an impact on the translucency ratings assigned to the three graphic symbol sets and/or systems used in the study (Huer, 2000). Apart from differences, some similarities were also seen: all four groups' results indicated PCS as the most translucent, DynaSyms as less translucent and Blissymbols as the least transparent. Since all participants did not live in their native country, Nigam (2003) argued that Huer (2000) could not make any claims in relation to interaction and graphic symbols (Bornman, Alant, du Preez, 2009).

Participants in Nakamura, Newell, Alm, and Waller's (1998) cross-cultural study were either native Japanese university student or students and staff from a Scottish university. None of the participants from Scotland had any knowledge of Japanese. Participants listened to a folktale and were requested to answer questions about the story. In answering the questions there were to conditions. Answering the questions with PCS alone or using PCS and an added particle array. Results indicated that syntactic elements from the user of the AAC device's language should be taken in account when developing a picture-based communication system.

The lack of African studies prompted several research studies relating to symbol sets and/or systems in the South African context since 1997. The studies made use of different symbols sets and/or systems namely Blissymbols (Alant, Life, & Harty, 2005; Bornman, et al., 2009; Moolman & Alant, 1997), CyberGlyphs (Alant, et. al., 2005) and PCS (Basson & Alant, 2005; Haupt & Alant, 2002; Visser, et al., 2008). These studies also looked at different symbol characteristics such as learnability (Alant et al., 2005; Basson & Alant, 2005), retention (Alant et al., 2005), iconicity (Basson & Alant, 2005; Haupt & Alant, 2002) and representation (Visser et al., 2008). The studies were conducted in 5 of South Africa's 11 official languages: Afrikaans, English, Northern Sotho (Sepedi), Setswana and Zulu (Alant et al., 2005; Basson & Alant, 2005; Bornman, et al., 2009; Haupt & Alant, 2002; Visser et al., 2008).

These studies have made valuable preliminary contributions to the knowledge base of graphic symbols in the South African context. The results of the two "iconicity-studies" by Haupt

and Alant (2002) and Basson and Alant (2005) indicated generally low average iconicity scores for the particular PCS used in the studies (Bornman, et al., 2009). Although these two studies could not be statistically compared (due to too many variables differences between the two populations), descriptive comparisons revealed differences between the studies could be a reflection of the different cultural experiences of the two participant groups. This suggests that although PCS may be seen as one of the most iconic symbol sets, there cannot be the assumption that it will be equally guessable for different population groups (Basson & Alant, 2005).

The studies by Basson and Alant (2005) and Bornman, et al. (2009) gives evidence that merely being exposed to symbol sets/systems enhanced the participants' perception of transparency and translucency of the PCS and Blissymbols used in their respective studies.

These South African studies investigated different symbol characteristics, symbol sets and/or systems as well as participants from different language groupings. Although the descriptive comparisons were made between Haupt and Alant (2002) and Basson and Alant (2005) and the Bornman et al. (2009) study and an international study, none of these studies had a statistical comparison as part of their aims. Thus up until now, no comparisons between two different South African groups have been made. This leaves a gap in research with regard to the generalisability of research results from one South African language group to another.
Studies done on the iconicity of PCS with two different language populations in South Africa (Basson, 2004; Haupt, 2001) indicated that practitioners cannot assume that participants in different cultures will perceive the iconicity of symbols the same. Even though research in the field of psychology (Ekman, et al., 1987; Shioiri, et al, 1999) indicated universality of emotion, one cannot assume that all pictures (symbols) depicting emotions will be iconic/universal. It is important to remember that most of the reported studies used photographs as stimuli and not pictures (line drawings / symbols).

The study by Visser, et al. (2008) indicated that the English-speaking Caucasian participants were able to recognize the emotions conveyed by the graphic symbols but a variety of unexpected choices were also made.

As mentioned previously most of the studies investigating emotions made use of photos; because of this, little is known about how emotions is represented by graphic symbols

(specifically line drawings). A search within the AAC literature offered only one study looking specifically at how graphic symbols represent emotions. This particular study looked at the four basic emotions of happiness, sadness, fear and anger (Visser, et al., 2008) and results indicate that some graphic representations of emotions may be more difficult to recognise than others (afraid and angry more difficult than happy).

Of the six basic emotions (Ekman, et al., 1987; Shioiri, et al, 1999) anger (Luftig, Page, & Lloyd, 1983) and surprise (Fuller, 1997) occurred once, sadness (Bloomberg et al, 1990; Luftig, 1983; Luftig, et al, 1983) three times, fear (Bloomberg et al, 1990; Luftig, 1983; Mizuko, 1987; Mizuko & Reichle, 1989) four times and happiness (Bloomberg et al, 1990; Luftig, 1983; Luftig, et al, 1983; Mizuko, 1987; Mizuko & Reichle, 1989) five times. All of these studies commented on the test stimuli's iconicity within the set and/or system and not on single graphic symbols.

In Visser, et al.'s (2008) study, English-speaking caucasian children were to inidicate which graphic symbol they though represented a particular emotion. Each participant was seen individually. The session started with a pre-test to determine whether or not the participant knew the four emotions (happy, sad, afraid and angry) used in the study. If the participant was able to show this knowledge he/she received a 12 sheet booklet. Each sheet contained 16 graphic symbols representing each emotion (4 symbols per emotion). All sixteen symbols appear on eah sheet, but was randomly assigned different possitions on each sheet. All but two symbols were from the PCS set; the other two were from PICSYMS and Makaton respectively (Visser, et al., 2008). The sixteen symbols as well as the symbol set/system they orignated from is presented in Appendix O.

During the session the participant listend to 12 vignettes (three vignettes per emption). Each vignette was followed with the corresponding emotion label. After listening to each vignette the participant was required to indicate which symbol of the sixteen symbols, he thought depicted the emotion the protagonast in the story felt. An example of a question is: *"It is Peter's birthday. He got a big present. He is happy. Show me the happy face."* (Visser, et al., 2008, page 307).

The results from this study indicated that for all four emotions most of the participants chose symbols to represent the different emotions from the anticipated options. One unexpected

symbol, was chosen to represent happy, four unexpected symbols to represent sad eight unexpected symbols to represent afraid and seven unexpected symbols chosen to represent angry.

Visser et al. (2008) mentioned that the above results indicated that "there is a difference between the four emotions in terms of the variety and frequency of unexpected symbols per emotion" (pg 308). The highest consensus in relation to expected responses ranged from happy (99%) at the higher end to sad (37%) at the lower end, with angry (85%) and afraid (74%) in the middle.

Visser, et al. (2008) felt that the results from their study suggested that some emotions may be more susceptible to individual influences than other. Apart from the variables mentioned earlier, intensity of emotion may play a role in children's choices of graphical representations. Although the participants in Visser, et al. (2008)'s was culturally a homogeneous group; individual differences with regard to the intensity of emotions displayed; could account for the differences in choice for the same emotion in answer to the three vignettes.

Visser et al. (2008) mentioned that a possible reason that participants in their study chose different symbols for the 3 vignettes depicting a certain emotion could be that they assign different intensities to the different vignettes. As each participant comes with his/her own emotional history, each participants' emotion situation knowledge is unique. Wang (2003) found that the intensity component of situation knowledge is sensitive to cultural influences.

With this in mind the current study will look at which symbols children from two South African language groups (Afrikaans and Sepedi) chose to represent each of the four basic emotions. Each emotion will be presented through 6 vignettes. Furthermore the study will take an initial look to see whether the intensity that a participant perceive a certain emotion vignette have, will influence the participant's choice of graphic symbols to represent the four emotions of happiness, sadness, anger and fear. The main differences between the current study and the study by Visser, et al. (2008) are the age and language of the participants, the fact that two different language group are interviewed giving the chance for statistical comparison, more vignettes per emotion and the opportunity afforded to participants to indicate how intense the protagonist will experience the emotion.

2.8. Summary

This chapter discussed the construct of emotion, looking at the definitions of basic emotions, the development of emotions in typically developing children, recognition and understanding of emotions in self and others as well as emotion knowledge as well as the visual perception of graphical symbols representing emotions and facial expressions. International and South African studies on aided communication and in particular iconicity were also discussed. The final section focused specifically on emotions depicted by graphic symbols.