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The semiotics of aided language development

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ABSTRACT

Some children fail to develop speech due to motor impairments, and have to use graphic symbols on communication aids to express themselves. Young aided communicators typically hear and produce different language forms. The adults' child-directed language hence has a different form from the child's utterances and their expansions of the child's utterances tend to contain many linguistic elements that the children are unable to construct and produce. Reading and writing typically develop late in children who lack speech, and sometimes remain limited. The small graphic vocabulary of young aided communicators implies that they often have to rely on unusual and untaught ways of constructing meaning. The semiotics of their expressive communication appears to be a blend of the spoken language they hear, the graphic representations of the communication system they use, and the strategies they use to construct the expressions. Young aided communicators may show significant achievements, even when the language environment gives poor constructive support. This atypical form of language development may shed light on the children's language situation and on language and semiotics in general.

1. Introduction

Most children learn language provided they grow up in a community with a form of language that they can understand and use (Nelson, 2007; Tomasello, 2003, 2009). For the vast majority of children, this is a spoken language but some children are unable to produce speech due to motor impairments and develop language produced with various forms of communication aids, *aided language* (von Tetzchner & Basil, 2011). However, this development does not come of itself but depends on the availability of a language form that can replace the functions of speech. Various graphic communication systems have been designed for use in communication aids and there has been a strong focus on ease of recognition and pictorial similarity with the referent (iconicity), hence contradicting the principle of arbitrariness in linguistic signs. The present article discusses how the graphic communication form provided to nonspeaking children may influence their language development and whether the current approaches contribute to limiting the scope and generativity of the children's language.

Language development is influenced by the child's abilities and the quality of the language environment (Hoff, 2006; Veneziano, 2013; Weisleder & Fernald, 2013), but also by the characteristics of the language forms that are accessible (e.g., De Houwer, 2009; Klima & Bellugi, 1979; Slobin, 1985). Children who develop aided language – emergent aided communicators – constitute a heterogeneous group with different abilities and disabilities which influence the conceptual and social transactional processes involved in language development and potential ways and means of scaffolding (Eddins, 1987; Gerber & Kraat, 1992; von Tetzchner, 2009; von Tetzchner & Grove, 2003). The present article addresses the early development of aided communicators who belong to the *expressive language group* which is characterized by a large gap between

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their comprehension and production of speech (von Tetzchner & Martinsen, 2000), and have comprehension of spoken language within the normal range. The semiotics of their expressive communication appears to be a blend between the spoken language they hear, the graphic representations of the communication system they use, and the strategies they apply to construct utterances. The major issue discussed here is how the use of communication systems with mainly pictographic symbols may influence the utterances and conversational interactions of young aided communicators. The claim is that the pictographic quality of the symbols will have a decisive influence on the communication partners' interpretation of graphic utterances and hence on how aided communicators come to use the symbols and construct utterances.

2. Graphic communication systems

Spoken words may be regarded as a blend of form and function, of articulated sound and concept (de Saussure, 1974; Fauconnier & Turner, 2002). A graphic communication system is a set of graphic representations designed for being used in social interaction and fulfil all or most of the functions of spoken language. It should be noted that in the field of augmentative and alternative communication the term symbol is used about graphic representations belonging to a graphic communication system, like Blissymbols (Bliss, 1965), Picture Communication Symbols (PCS) (Johnson, 1981) and Pictogram Ideogram Communication (PIC) (Maharaj, 1980), of which many would be classified as icons by Peirce (van Langendonck, 2007).

Graphic communication systems vary with regard to how pictographic and ideographic their symbols are, and to what extent they primarily constitute a code for spoken words (see Fuller, Lloyd & Stratton, 1997; von Tetzchner & Jensen, 1996). At one end of the pictographic–ideographic dimension are the mainly pictographic systems such as PCS and PIC (Fig. 1) with images representing categories of people, animals, objects, actions and qualities, usually depicting one instance of the category represented by the symbol. For example, a drawing of a small round ball may represent all objects belonging to the category "ball" independent of their size, colour and shape, and a drawing of a German shepherd dog may represent the category "dog". Images of a stickman may be used to represent action categories like "jump" and "throw" (Fig. 1). It is possible to combine pictographic symbols, for example *ICECREAM CAR or DOG RUN*, but most graphic communication systems do not have explicit syntactic rules or grammatical symbols that modify other symbols, for example by adding plural or tense.

At the other end of the pictographic–ideographic dimension is the Blissymbolics system (Bliss, 1965). It is mainly ideographic but contains many pictographic elements (see Fig. 2). It has 100 basic symbols, or *radicals*, that can be combined to form new meanings. For example, *ELEPHANT* usually consists of *ANIMAL + NOSE* and *HOME* is *HOUSE + FEELING* (Fig. 2). Blissymbols include markers for grammatical inflections such as *PAST-TENSE*, *PLURAL* or *ACTION*. When *ACTION* is added to the symbol, nouns are transformed into verbs, for example *CAR + ACTION* becomes (to) DRIVE (Fig. 2). Some Blissymbols are strategic in the sense that they represent an instruction to the communication partner about the interpretation of a Blissymbol, for example *OPPOSITE-MEANING*, *SIMILAR-TO*, *SOUND-LIKE* and *LOOK-LIKE*. The element SOUND-LIKE illustrates how graphic and vocal language elements may blend in the use of Blissymbols. The aided communicator indicates SOUND-LIKE and a symbol with a corresponding spoken word (gloss) that sounds similar to a spoken word that express what the aided communicator wants to say, for example SOUND-LIKE + CAR may be used to express "care" or "can". Communication aids with Blissymbols usually consist of basic, modifying and strategic symbols, and combinations that the user often needs.

Minspeak – an acronym for «minimum effort speech» – is the most common code system. It is used only in electronic communication aids and the aided communicator produces pre-stored words and sentences in synthetic speech by constructing sequences of icons, for example "drink" by sequencing JUICE + VERB, and "thirsty" by sequencing JUICE + ADJECTIVE. A given sequence will always produce the same premade word or sentence spoken with a synthetic voice. Minspeak also includes inflectional markers based on the spoken language, like *-ed* and *-ing* (Baker, 1982, 1986; Binger, Maguire-Marshall, & Kent-Walsh, 2011).

There is no record of how much the different communication systems are used today. The majority of children who use communication aids start with a mainly pictographic system, and PCS is the most widely used pictographic system in most parts of the world. In the past, many children changed to Blissymbols after using PCS or PIC for some years, but the use of Blissymbols has gradually been reduced (McNaughton, 2003, 2013; von Tetzchner, 1997; von Tetzchner & Oxley, 2013). Most aided communicators continue to use PCS or another mainly pictographic system until they learn to read and write. However, the acquisition of reading and writing is difficult for nonspeaking children and many aided communicators never learn to read and write so well that letters can fulfil all communicative functions (Smith, 2005). Coding systems like Minspeak are complex and may be difficult to learn (Light et al., 2004) and are mainly used by older children and adults. They are therefore not considered here.

3. Vocabulary development

The age at onset of speech in naturally speaking children varies, some start to speak at ten months of age, others at 17 month of age (Bates, Dale, & Thal, 1995). Onset of aided communication, that is, the age when non-speaking children are provided with graphic symbols for expressing themselves is considerably higher, often when they are three years or older (Light, Collier, & Parnes, 1985; Soto & Hartmann, 2006; von Tetzchner, 1997; von Tetzchner et al., 2010). Moreover, while naturally speaking children may learn 5–9 nine words per day throughout childhood and adolescence (Anglin, 1993; Carey, 1978), young aided communicators may have a total of 200–300 graphic symbols in their aids, and older children and adolescents 400–1000 symbols with word, phrase and sentence glosses (Hjelmquist & Sandberg, 1996; von Tetzchner,