Jagoe, C. & Smith, M. (2016). Relevance in the context of multimodality and aided communication, in, editor(s)M. Smith , *The silent partner? Language learning and language use in aided communication.*, London, J&R Press.

Introduction

Multimodality is a feature of all human communication, but individuals who use augmentative and alternative communication may rely in a unique way on multimodal communication, incorporating unaided modes such as gaze and vocalisations, as well as aided modes, as they participate in the co-construction of meaning with communication partners in interaction. The impact of multimodal communication on the conversation process, in terms of how aided components are "treated" in the interaction, how a speaker makes choices of which message elements to encode in aided communication and how listeners receive and interpret messages have been explored through various different paradigms, including structural-linguistic (Binger & Light, 2008; Soto, 1997), conversation analysis (Bloch & Beeke, 2008; Bloch & Clarke, 2013; Clarke & Wilkinson, 2007, 2008; Clarke & Wilkinson, 2009; Hornmeyer & Renner, 2013) and discourse analysis (Light, Collier, & Parnes, 1985a). A theoretical framework that has seen less application in the field of AAC is that of Relevance Theory (RT), a cognitive-pragmatic approach to interpreting communication and interaction phenomena. RT offers the potential to increase our understanding of the cognitive-pragmatic processes at play in interactions involving the use of aided communication, offering a potential explanatory framework for interpreting communication behaviours.

This chapter will present a brief introduction to the notion of *relevance* as it evolved from Gricean pragmatics and will then provide an overview of some key

concepts in Relevance Theory, before applying specific features of the theory to data involving the use of aided communication in interactions between a child, a teacher and a researcher.

The Roots of Relevance: Gricean Pragmatics and Aided Communication

The role and importance of relevance in communication has long been recognised. In his classic analysis of discourse, Grice (1975) proposed that a fundamental organisation principle supporting successful conversations was the *Co-Operative Principle*: "Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged" (p. 45). From this fundamental principle flow four categories of maxims or rules governing conversations: quantity, quality, relation and manner. The maxim of quantity presumes that a speaker's contribution provides sufficient but not excessive information for a communication partner, given the context (*make your contribution as informative as is required*). Quality refers to a speaker's efforts to make a contribution a truthful one. Manner relates to the clarity of an utterance, encompassing sub-maxims such as avoiding obscurity and ambiguity of expression, and being orderly and brief. The maxim of relation is formulated succinctly: be relevant. The terseness of the formulation of the maxim belies the complexity of the notion of relevance, and of the processes that allow speakers to negotiate shifts in relevance in the course of a talk exchange. However, a fundamental tenet of the cooperative principle is that interactants should assume that a contribution is intended as relevant by the speaker and so should be interpreted in that light. While Grice's maxims are not prescriptive, if the overt meaning of a sentence does not seem consistent with the maxims, and yet the circumstances suggest that a speaker is complying with the cooperative principle, a communication partner typically seeks to

discover what the speaker might mean in that context. A key question supporting this search for alternative meanings could be framed in terms of relevance: *given what I know, how could this contribution be relevant to what has gone before and therefore what interpretation is available and potentially appropriate*? This search for a relevant meaning offers a framework for explaining how it is possible for an interaction partner to interpret "it's ten o'clock*"* as an adequate response to an invitation to a cup of coffee.

As pointed out by Bedrosian, Hoag and McCoy (2003), individuals who use aided communication frequently face situations where it is extremely difficult for them to comply with the above conventions of orderly, structured conversation behaviours. Many of these difficulties arise from the necessarily slow rate of aided communication, as well as vocabulary constraints that mean that both ambiguity and obscurity may be unavoidable. In a series of studies, (Bedrosian, Hoag, & McCoy, 2003; Hoag, Bedrosian, McCoy, & Johnson, 2004, 2008; McCoy, Bedrosian, Hoag, & Johnson, 2007), Bedrosian and colleagues explored the impact of competing pressures in relation to three of Grice's maxims (quantity, relation and manner) on the attitudes of observers towards individuals using voice output devices. Participants in these studies observed scripted events where actors used a voice output device to interact with service personnel in a bookstore, a movie theatre and a hair salon. The scripts were constructed to simulate situations where the contribution provided using aided communication was manipulated, to mirror a range of possible situations: a pre-stored context-relevant utterance (i.e., complying with the maxims of both manner and relation); a pre-stored partially relevant utterance (rapid but violating the maxim of relevance); a pre-stored utterance that was edited within the interaction causing a

delay, (i.e., relevant but slow, violating the maxim of manner); a pre-stored utterance that contained repetitions (relevant, but violating the maxim of quantity).

Not surprisingly, observers consistently rated interactions that combined relevance and speed more favourably than other interactions, although floor-holding contributions that alerted listeners that there might be a long delay in generating the next contribution ("*I am going to communicate a message but need a bit of time*"), enhanced observers' tolerance of slow communication. However, scripts that involved some violation of the principle of relevance were consistently rated least favourably of all the scenarios. Together, this series of studies suggests that for naïve communication partners at least, messages that are delivered slowly, but that are clearly relevant are perceived more favourably than messages that are delivered quickly, but where the relevance is hard to determine. Additionally, it seems that violation of the maxim of manner (i.e., through slow rate) can be ameliorated or attenuated through the use of a floor-holder.

While the work of Bedrosian and her colleagues has yielded important insights into the judgments made by observers about the relative impact of message relevance and speed of delivery on the success of an interaction, this work does not explore how participants in an interaction negotiate the complex landscape of relevance against a backdrop of limited resources for disambiguating contributions in aided communication. Faced with vocabulary limitations, children and adults using aided communication must often deal with a situation where the vocabulary they need to express a specific communicative intent is either not available to them, or cannot be located. In such a situation they often must select what could be described as a 'least bad – most relevant' match between an internal lexical representation and an external lexical option, while their interaction partner must often also struggle to determine

how an apparently tangential contribution could be interpreted as relevant to the context of the specific conversation. The rest of this chapter explores some of the principles of relevance and the struggles implicit in wrestling with the conundrum of *being relevant,* when the requisite resources are not easily available.

Relevance Theory: An Overview

Although RT has its roots in Grice's (1967) co-operative principle, it differs from Gricean pragmatic theory in fundamental respects. The most significant departure is in relation to the maxims proposed by Grice. RT sees *Relevance* as superseding all of these maxims (Sperber & Wilson, 1986/1995). The claims of Relevance Theory are embedded within claims about the nature of human cognition (Carston, 2002) and the notion of relevance is defined very specifically. Relevance is seen as a property of human cognition, allowing us to attend to stimuli that are "worthwhile". In other words, rather than expending cognitive effort on inputs that are not worth processing, human cognition is aimed at processing information that is potentially pertinent and will "benefit" the person involved. In RT terms, such benefits are called cognitive effects, in recognition that a stimulus is only relevant if it results in some "worthwhile difference to the individual's representation of the world" (Wilson & Sperber, 2004, p. 608). Relevance, therefore, is a property of two variables – the cognitive effects of the input, balanced against the processing costs to achieve that cognitive effect (Sperber & Wilson, 1986/1995) – in other words, a balance between effect and effort (van der Henst, Carles & Sperber, 2002).

Any input to the cognitive processes of an individual is potentially relevant and inputs can be either external (such as perceptual stimuli) or internal (such as assumptions or the output of inference, imagination, stimulus processing) (Sperber & Wilson, 1986/1995). An input (such a natural speech utterance, voice output from a

communication device or a physical point to a graphic symbol) is processed in the context of assumptions already held by the individual; the effect will be to allow the individual to "update" their representation of the world. When an interaction involves the use of aided communication, these principles, seen as universal by RT, still apply. However, the nature of the aided communication contributes another element of "inputs" that are potentially relevant. For example, in selecting an item from a device using symbols and orthographic representations, the listener has available the speech output of the device (equivalent to the fleeting auditory input in a spoken utterance), the symbol itself and the written word. While we can assume that in most cases the meaning of these different modes overlap, and hence all contribute to the relevance of the utterance, that aligning of relevance may not always apply.

Assuming that cognitive processes are geared to maximising relevance, communicative utterances that demand the hearer's attention (are "ostensive" in RT terms) create an inherent expectation of relevance (Carston, 1997). The hearer is entitled to assume that the speaker produced the utterance for a reason; indeed, in attracting the hearer's attention the speaker provides this tacit guarantee of relevance (Sperber & Wilson, 1986/1995). However, it would not be feasible for communicators to consistently produce utterances with the lowest possible processing costs and highest possible cognitive effects. The hearer is therefore entitled to expect that the speaker has produced the most relevant utterance that they are *willing* and *capable* of producing at that time and in that context, in other words, an utterance of optimal rather than maximal relevance (Sperber & Wilson, 1986/1995). It is this presumption of optimal relevance which guides both how communicators produce utterances and the process which hearers undertake in interpreting these communicative events.

This cognitive drive for relevance has far-reaching implications for explaining how communication occurs. A hearer is entitled to exploit the expectation of optimal relevance, in guiding their interpretation of an utterance, "follow[ing] a path of least effort in computing cognitive effects" (Wilson, 2000, p. 420). However, expectations of optimal relevance have implications, not only for the hearer of an utterance, but also for the speaker. As stated by Carston (2006) "It also follows from this [RT] view of communication that a speaker/writer should formulate her utterance […] in such a way that her intended meaning can be grasped with a minimal expenditure of effort by her audience" (p. 3). In formulating utterances therefore, speakers are engaged in inferring what information is both worthwhile for their listener and easy to process (van der Henst, Carles & Sperber, 2002).

Utterance Construction by Aided Speakers and Expectations of Relevance

Based on their inferences about potential cognitive effects and processing demands, all speakers make choices about what elements of a message to encode to maximise the possibility that a specific hearer, in a specific context will derive the intended inferences, and arrive at the target interpretation of an utterance. Decisions about which elements to encode are arguably far more complex in the context of aided communication. One important decision is about which message elements to encode using the aided modality and which elements may be more effectively or more efficiently encoded in unaided modes. Unaided modes of communication have been reported to dominate in many interactions where aided modes are potentially available (Clarke & Wilkinson, 2007; Falkman, Sandberg, & Hjelmquist, 2002; Light, Collier, & Parnes, 1985). Adults who use aided communication have reported that they rely more frequently on unaided modes of communication (McCall, Marková, Murphy, Moodie, & Collins, 1997; Smith & Connolly, 2008) and that a decision to encode a

message using an aided modality is influenced at least as much by consideration of who they are talking with, as what they are talking about (Smith & Connolly, 2008). It might seem intuitively sensible to encode simple affirmative agreement messages using head nods, vocalisation or facial expression, rather than selecting *"yes"* or *"no"* on a communication board or a speech output device, especially if such a selection involves both physical effort and time delay. However, strategic use of aided communication for such apparently unnecessary situations may enhance the illocutionary force of the agreement or disagreement (Hornmeyer & Renner, 2013).

Having decided on an element or aspect of a message to encode in aided communication, a second layer of decision-making involves how best to capture that element with the available resources. While spoken language represents one representational system (phonemes and morphemes), most aided communication systems offer multiple representation options. For example, communication boards frequently display a range of picture symbols, photos, letters and words or phrases (e.g., Binger & Light, 2007). Graphic symbols themselves typically incorporate at least two layers of information: a pictorial icon and a text label. The relationship between the icon and the text label can vary greatly. The label may name the referent (e.g., cat), may refer to a feature of the pictured referent (e.g., elbow). It may refer to a context where the pictured element may occur (e.g., countryside), or it may refer to a phonological rather than semantic feature of the pictured element (e.g., a picture of knees together to represent need) Additionally, each person viewing the icon may infer additional meanings or interpretations, based on prior experience and specific experience with pictures (Stephenson, 2009).

As a child selects a graphic symbol, multiple potential layers of information are offered to the speaker. The question is, how do both interactants come to understand

which dimension of the selected symbol is the one the child intends the interaction partner to pay attention to? If graphic symbols are displayed on a speech output device, another layer of complexity comes into play. Speech output devices offer the option of programming a range of different kinds of messages linked to a symbol. For example, a page may contain a cell with a line drawing of a partly-filled glass, and a text label *drink.* When selected, the speech output may match the verbal label (*"drink"*). Alternatively the speech output may be the name of a specific drink (e.g., *"lemonade"*) or a longer stored phrase *("My favourite drink is milk"*). A child using the device may select a symbol, focused on the icon, (i.e., *DRINK*), thereby generating a spoken message that bears only a tangential relationship with his or her communicative intention. For example, Light (1997, p. 165) recounts how Tim, a child sitting at dinner, vocalized to get his mother's attention, then looked at his dinner, looked back at his mother and then selected a single symbol that contained a line-drawing of a dog and the written label *dog* on his speech output device. The message generated by the device was a pre-programmed phrase *"My dog's name is Skippy".* As Light recounts, after numerous attempts, Tim's mother eventually determined that Tim intended her to attend to the orthographic label *dog* rather than the pre-stored speech message and that he was trying to tell her to give his dinner to the dog, because he didn't like it.

Even a text-based communication board typically offers a combination of single, frequently used words, short phrases and letters. Prospective speakers may have to make a strategic choice between spelling out a specific message, with associated time considerations, or selecting an available whole word or short phrase that may offer a less-than-perfect but acceptable match to the intended message. For example, if Peter wishes to persuade a busy nursing assistant to open his window, he may choose to

spell out "I-s t-h-e-r-e a-n-y c-h-a-n-c-e y-o-u c-o-u-l-d o-p-e-n t-h-e w-i-n-d-o-w f-o-r m-e?" (thereby meeting his desire to be persuasively polite, but risking losing the nursing assistant's attention). Alternatively, he may select an available phrase I'm too hot, which may be more quickly expressed, but has a potential mismatch with his desired tone, as well as being potentially more ambiguous (Should the assistant remove a blanket? Open the door? Turn down the heating?)

All these choices occur within the context of considerations of efficiency in item or utterance selection, as speakers using aided communication must navigate through their available options, in order to produce the utterance that best matches their communicative intent and in a way that is likely to be interpretable by a communication partner. How these complex decisions, affecting both participants in interactions involving aided communication, manifest within conversations is of interest from a pragmatic perspective and may have implications for interventions with those using AAC and their conversational partners.

Relevance, Modality and Aided Communication

Relevance and Modality Choices: Considerations for the Aided Speaker

In the extract below (Extract 10.1^{BAC}), Noel aged eight years is describing a picture to a teacher, who has worked with him over several years and who is very familiar with his communication. The teacher is sitting beside Noel and cannot see the picture he is describing (a bald man combing his hair with a toothbrush, see Figure 10.1). Noel is using a voice output device, with a dynamic display. He uses two switches to access the device, one a head-switch and the other a switch mounted on his tray, which he activates using his fist. Noel finds physically accessing his device challenging, and his rate of aided communication is slow. He uses directed scanning,

his head switch moving the highlighter across a row or block of cells and then using a switch on his tray with his fist to select a specific cell.

INSERT FIGURES 10.1 AND EXTRACT 10.1 ABOUT HERE

The interaction in Extract 10.1 *BAC* unfolds over a period of almost seven minutes. Throughout the interaction, the teacher can see Noel's display, and his attempts to find and select symbols. As Noel's device is set up with vocabulary organised in hierarchical branching pages, many top-layer pages contain folders that themselves open into lexical sets. Therefore Noel often must make several selections before finally accessing the specific symbol he wishes to select and send to the message bar. Given his increasing literacy skills, Noel has several pages that contain written words only, and others that contain a combination of graphic symbols and written words. He also has a choice as to whether he activates the synthetic speech output as he selects each symbol, or whether he only generates the spoken output once all elements have been sent to the message bar[1].

Decisions about what elements to encode linguistically in this interaction are complex. The picture Noel is describing represents an unlikely scenario (a bald man brushing his hair with a toothbrush). The unpredictable nature of the scenario makes it likely that it will be effortful for the listener to process, as it will involve potentially setting aside assumptions that the listener might reasonably make (e.g., that a toothbrush is for brushing teeth). However, there is also a lot of other detail in the picture that Noel could choose to describe, such as the age or physical appearance of the man, his clothes, what he is holding. His challenge is to determine what the most

[1] In the extract of aided communication, following the conventions of von Tetzchner and Basil (2011), natural speech is presented in italic font, while synthetic speech is in italic font within parentheses. Graphic symbols are presented in upper case italic font, and written words are underlined. The left-hand column sets out the interaction as it unfolds. In the right-hand column, detail is provided about the operational construction of aided communication output. A superscript [F] beside a symbol label indicates that selecting this symbol opens a pop-up folder containing additional vocabulary.

salient element of the picture should be and then from his aided communication system, determine selections based on the key components required to communicate the message, as would be expected by his communication partner. He has decisions to make about modality, the processing effort required by the hearer and, in addition, message efficiency.

Noel first navigates through two folders to establish the actor in the picture, *"granddad"* (line 4). Prompted to provide more information on what granddad is doing, he searches his *THINGS* folder, then closes it and opens a folder of *DESCRIBING WORDS.* After a long pause as he looks at the page, he selects the symbol *BEFORE*, sends it to the message bar, but does not activate the speech output (line 13). There is a strong visual similarity between the visual icon representing *BEFORE*, (an older man with messy hair and a brush with which to comb it) and the picture that Noel is trying to describe. The teacher appears confused, and the researcher steps in, interpreting the lack of speech output as indicating that the intended message is related to the symbol selected, but that the symbol is not to be interpreted literally. Of course, the researcher has the advantage of having seen the picture to be described, and so is able to establish the relevance of the selected item, inferring that it is the visual dimension of the symbol rather than the orthographic label that is optimally relevant. Noel's next selection of *CD* raises further confusion. Again, he selects this symbol, but does not initially activate speech output. Once he has activated the speech output, he rejects this selection. He returns to his *DESCRIBING WORDS* folder and after hovering for some time over *OLD* he selects *PRETTY* (line 27) and repeats his selection of *BEFORE* (line 31), once again without activating speech output.

The choice to encode the concept of brushing hair in this way is not only transparent but also creative when one has access to the context – the picture to be described. It appears that Noel has used *BEFORE* for the icon dimension of symbol (representing hair that needs brushing), rather than for the orthographic label. Noel does not activate the speech output for this item, treating it differently to other lexical items in the interaction. This decision is itself potentially significant in terms of signalling relevance, plausibly reflecting a decision to foreground the icon and minimise the linguistic label. In selecting this item, Noel is aware that the communication partner has visual access to his selection (in other words, that the teacher can see both the icon represented and its written label). In RT terms the item is mutually manifest; both parties are able to perceive the stimulus. Noel's choice of item appears to provide the potential for a hearer to infer the concepts of old man, messy hair, made pretty and (assuming the inferential process progresses as anticipated), Noel could introduce the concept toothbrush to complete the message. However, it quickly emerges through the sequence of meaning negotiation, that the relevance of the item *BEFORE* is not readily accessible to the communication partner, who prioritises the unspoken linguistic label over the symbol content (a process perhaps driven by her own considerations of relevance). Noel is clearly aware of this breakdown. Demonstrating further creativity in his attempt to create relevance for the hearer, he moves into his Irish language section of the device, where he can access vocabulary for body parts and produces "*gruaig*", (hair), along with "*fiacla*" (teeth).

Focusing on the cognitive processes undertaken in this sequence of aided communication, it is clear that Noel is aware of the hearer's needs, but has a complex balancing act of choices across modality (orthographic/linguistic label, graphic symbol, language) in the context of accessibility for the hearer. There is some

evidence that speakers tend to act in such a way as to minimise the effort on the part of their hearers, even when there is extra processing cost to themselves: "they spontaneously adjust the level of accuracy of their utterances — up or down as the context requires — so as to optimise relevance" (van der Henst, Carles, & Sperber, 2002, p. 465). In choosing to capitalise on the visual dimension of the symbol associated with *BEFORE*, Noel makes a choice that involves greater effort for him (i.e., recalling that the symbol *BEFORE* includes a representation of messy hair, finding and navigating to the appropriate folder) but offers a potentially rich pictorial context to support message interpretation. His selection of this item involves 16 steps and approximately 48 seconds. In contrast, the selection he makes to repair the interaction through using his Irish vocabulary page, takes 9 selections and approximately 23 seconds. This contrast suggests that even within the complexity of this aided interaction, Noel is taking his hearer's expectations of relevance into account. Given his choices, the impact on the hearer will be considered next.

Relevance and Modality Choice: Challenges for the Hearer

Relevance Theory acknowledges that speakers are not always able to formulate an utterance that represents the most efficient communication of their message, or they may change their message mid-utterance. Speakers may assume information to be relevant to a person when it is not, for example, pointing out information without realising that the hearer is already aware of the facts communicated (Sperber & Wilson, 1986/1995). Given the universality of the cognitive processes underlying communication, an RT approach suggests that speakers using aided communication can expect their hearers to engage in the same process of utterance interpretation, following the relevance theoretic process of "consider[ing] interpretations in order of

accessibility [and] stop[ping] when your expectation of relevance is satisfied" (Wilson, 2000, p. 420).

While Noel adjusts his utterance to convey the key elements initially missed by his communication partner (lines 43-51), the question arises to why the utterance still fails to achieve relevance for the hearer? The key issue appears to be the partner's inability to move past the linguistic/orthographic label of *before*. It appears that the hearer remains stuck on what is arguably a literal interpretation of the utterance (or utterance component in the case of *BEFORE*), despite the fact that Noel treated this item differently to other selections, by avoiding activating the speech output.

RT argues that an utterance is a "piece of evidence about the speaker's meaning" (Wilson & Sperber, 2012, p.20), and therefore that the words in an utterance act to point the listener towards the intended meaning. It is on this basis that RT argues that speakers may choose to use approximations which may not be literally true, in order to satisfy the expectations of relevance. Interaction is arguably full of examples of "loose use", in which the hearer is expected to construct an *ad hoc* concept from a lexically encoded concept during utterance interpretation. Carston (2002) illustrates this notion of loose use of a concept with an example where someone introduces a friend to a new cat saying, *"Here's my new flatmate"*. In this example, the concept *flatmate* must be broadened to include non-humans if the utterance is to be interpreted as intended. The question arises as to whether such processes of loose use can be followed by hearers, when an aided speaker uses a pictorial symbol in such a manner. Noel appears to expect his hearer to act in this manner – to interpret the item *BEFORE* in a loose sense, less constrained by the linguistic label, and embracing the pictorial content. Indeed, Noel provides his hearer with a cue that this is how he intends the item to be interpreted, through his lack of

voice output for the item (in both lines 13 and 31). It appears that the communication partner disregards the pictorial content of the message, perhaps considering symbols as primarily supporting the aided speaker (for example, in navigating the vocabulary items), rather than adding to the message itself. Within the interaction in Extract 10.2 at least, the lexical-orthographic dimension of the symbol seems to assume priority for the communication partner as she seeks a potentially relevant interpretation. Noel clearly anticipates his partner will engage in the inferential work implicit in concept broadening and when this doesn't happen, he takes steps to repair the conversation, thereby explicitly drawing attention to hair and teeth (lines 43-51).

A second extract (Extract 10.2^{BAC}) demonstrates a similar situation in which the aided speaker (again Noel) appears to expect the hearer to interpret his utterance in a loose sense, directing her towards an intended meaning. A key source of ambiguity in this example is the use of pre-stored messages. As noted previously, there is some evidence that pre-stored messages containing content that is not transparently relevant may be particularly problematic for interaction partners (e.g., Bedrosian et al., 2003; Hoag et al., 2008).

Pre-stored messages are typically relevant for very specific situations, often including frequently used phrases or specific information, such as personal introductions or salient items of news. These messages may, however, also contain linguistic elements that are not available to the aided speaker in other forms, unless their literacy level allows them to use spelling. For example, it is plausible that an individual may have a very specific utterance such as, *"My grandmother lives in Paris",* but not have *"Paris"* stored as an individual element. In this case, creative use of the pre-stored message may help in directing a hearer towards the intended concept. In this type of scenario, the interactant using aided communication arguably

expects his hearer to interpret the utterance very broadly – extending the interpretation from referring to a specific event to more loosely referring to one linguistic element.

As with all communication, the interpretation of the utterance is significantly context-bound. In other words, in the context in which the individual was asked, "what were you doing in France?" the use of the pre-stored message, *"My grandmother lives in Paris"* should, (and most likely would) be interpreted in its narrowest sense, that the speaker was visiting his grandmother, specifically in Paris. If the same utterance were used in response to a question "what did you think of the rugby match?" additional processing effort is likely to be required to define the potential scope of meaning that is relevant. The hearer is entitled to infer that the utterance has some meaning in the context, either related to the concept "grandmother" or to "Paris". The production of an utterance itself guarantees relevance but the utterance requires additional processing on the part of the hearer: it is not fully specified for the context of interpreting a description of an unseen picture. The outcome is that the hearer must engage in additional inferential work to link the utterance to that specific context. Relevance Theory suggests that the hearer who is engaging in this additional work, is likely to take a cautiously optimistic approach to the interpretation of the utterance, considering "what interpretation the speaker might have thought […] was relevant enough" (Wilson, 2000, p.421).

In the example that follows Noel has viewed a video where a child driving a powered wheelchair has completed a circle and Noel is describing the video to his teacher, who was not present when the video was viewed. He selects three pre-stored messages, none of which are fully relevant, but each of which contain partially relevant information. An alternative option might be for him to attempt to spell out

the target message, but it is not clear that he has the necessary literacy skills for this strategy. There may also be physical considerations in relation to spelling, given his very slow and effortful access. Using a pre-stored message may in Grice's terms, meet the demands of manner, but at the cost of the maxim of relation (i.e., relevance).

INSERT EXTRACT 10.2^{BAC} ABOUT HERE

In this extract, Noel needs to communicate the concept "powerchair", as well as communicate an action of turning around in a circle. His hearer is aware that the purpose of this communication exchange is to describe a video clip. In this instance, without access to the stand-alone concept "powerchair" Noel is arguably justified in selecting a pre-stored message containing the relevant word *"powerchair"* and expecting his hearer to draw the inference that the video was about a powerchair. Noel's use of the pre-stored messages, similar to the example cited earlier from Light (1997), shows a high degree of creativity and efficiency. With knowledge of the content of the video, his rationale for selecting the pre-stored message seems clear. However, his listener does not interpret the utterances in the manner intended and, in this case, Noel does not attempt a repair. Again the hearer prioritises the "literal" linguistic content, despite her clear uncertainty that this is indeed the intended message (evident from her questioning in lines 5, 9 and 16).

Noel accepts the hearer's slightly inaccurate interpretation (that the video was of him moving left and right in the chair), perhaps because he has decided that the repair is too complex. Alternatively he may feel that the hearer's interpretation of the video, (that a child is moving in a powerchair), is sufficiently close to satisfy expectations of relevance, particularly if he was tiring of the activity. The implications of an inaccuracy (who was in the powerchair and the precise type of movement that was made) may not seem sufficiently consequential to warrant

engaging in complex meaning negotiation. This preference may be explained by the notion of optimal relevance, "a speaker aiming at optimal relevance may prefer a formulation that requires less effort from herself and more from the hearer, provided that the resulting utterance is still relevant enough to be worth the hearer's attention" (van der Henst et al., 2002 p. 459).

Conclusion

A Relevance Theory analysis of the interactions between Noel and his teacher portray a child clearly engaged in sophisticated and creative utterance formulation. An RT account demonstrates the high degree of complexity involved in modality choices for speakers using aided communication as they balance relevance for their hearer with efficiency in finding and selecting relevant elements for the intended utterance. Both participants in the interaction must engage with multiple modalities in parallel, to produce and interpret a single utterance, utilising pictorial content, linguistic labels, verbal output and novel behaviours, such as withholding voice output to signal the primacy of the visual element of the message. These complex communicative decisions on the part of the speaker appear to be made with the expectation that the hearer will follow the process of utterance interpretation, using the elements as a blueprint to guide interpretation. The speaker using aided communication clearly expects the hearer to engage in an inferential process. In both analyses, however, the hearer appears to privilege the linguistic element or the surface form of the utterance produced through voice output. In the first extract analysed, this approach to aided utterance interpretation leads to misunderstanding and subsequent repair by Noel. In the second extract, a misunderstanding is clear to the researcher who is aware of the intended message, but the participant using aided communication in this case appears to elect to allow the slightly erroneous interpretation to stand.

In interactions involving aided communication, instances in which the hearer foregrounds the literal elements of the utterance, have been reported previously (Basil, 1992; Light, 1997). The reasons for the apparent privileged status of the verbal element or label requires some exploration. Two explanations will be proposed here, explored within a RT framework. This first is whether the verbal elements of the utterance are privileged in a cognitive sense for hearers. The second issue raised is whether there is a socio-pragmatic element to the hearers' behaviour in these interactions.

RT argues that utterances have unique features as inputs to the cognitive system. The first characteristic of utterances as stimuli is that they are ostensive (i.e., they place an overt demand on the hearer's attention), and therefore place a direct demand on processing. In so doing, utterances create an expectation of their own relevance (Carston, 1997, p. 4). This ostensive characteristic is arguably present no matter what modality is used. However, selection of a less frequently used modality (e.g., aided communication) may draw additional focus on such utterances, placing an even more overt demand on the hearer's attention, perhaps to highlight a pragmatic intent (see for example, Hornmeyer & Renner, 2013).

The other unique characteristic of a linguistic stimulus is that an utterance employs a coded element that acts to direct the hearer's processing and constrains the possible interpretations of the stimulus (Sperber & Wilson, 1986/1995). It could be argued that in the context of aided communication, the verbal label associated with a particular symbol, or the full surface form of a pre-stored message, each provide more constraints on possible interpretations (i.e., the meanings of both the label and the pre-stored message are specified more explicitly) than the associated graphic dimension of the symbol. Processing the verbal label or the pre-stored message therefore should

logically involve a lower processing effort. The concept of optimal relevance implies that hearers are entitled to expect that the speaker has produced the most relevant utterance that they are *willing* and *capable* of producing (Sperber & Wilson, 1986/1995) to allow the hearer to interpret that utterance, "follow[ing] a path of least effort in computing cognitive effects" (Wilson, 2000, p. 420). It is possible that a lexically encoded concept (whether as a written word or a pre-stored utterance) is perceived as guaranteeing a greater degree of relevance than a picture symbol (in that it provides a specific blueprint of meaning, reducing the guesswork associated with inferring meaning, and thereby reducing processing effort). A logical implication is that hearers might be expected to consistently foreground lexical labels in interactions involving graphic symbols and icons.

The second explanation for the privileging of the verbal over graphic symbol information by the hearer involves a sociopragmatic element. A hearer approaching interaction involving aided communication may do so with a predisposition to 'treat the interaction as naturally as possible'. This approach may result from a general desire to demonstrate respect and acceptance of the communication form, or it may even arise from communication training in which conversation partners might be encouraged to "treat the person using aided communication as they would any other speaker". From an RT perspective, this general disposition towards the speaker would be treated as an assumption, an internal cognitive input that makes up part of the context in which utterances are interpreted. The result of such an approach may be that the hearer works from the assumption that the output of the device (the linguistic elements of the utterance, whether selected or selected and spoken through voice output) comprises the intended message. The hearer may therefore approach the utterance as a code to be decoded – the exact approach to pragmatics that RT has

demonstrated is unable to yield a reliable inferential interpretation. Treating the device as a conduit in which the output (product) is the meaning intended by the aided speaker may have its benefits (communicating acceptance for the aided modalities, respect for the individual as an independent communicator) but from a cognitive pragmatic perspective it may act to limit the assumptions available to the hearer, thereby potentially undermining the success of the interaction.

An individual using aided communication has a potential challenge with regards to "loose use" of language. As a speaker they may intend the listener to interpret an element of their utterance loosely, but in which modality? Creative use of a device may be useful to signal the relative supremacy of a modality in any given utterance, for example by avoiding voice output when the pictorial content is to be foregrounded. In the examples analysed in this chapter, these strategies were not immediately successful and the lexical concepts encoded either in the orthographic label or the speech output of the device seemed to take priority for the hearer in the search for possible relevant meanings.

Whether the act of privileging the verbal element of the utterance is a feature of the cognitive-pragmatic processes at play, or of sociopragmatic expectations, there are clinical implications. One potential implication is that conversation partner training may require specific focus or sensitisation of conversational partners to these features of interactions involving aided communication. The potential for creative use of multiple modalities, and evidence of "loose use" of nonverbal modalities, and their associated pragmatic consequences should perhaps be explicitly discussed in order to enhance perceived success for all participants in interactions involving aided communication. Increased metapragmatic awareness may serve as an additional tool in facilitating successful navigation of these sophisticated modality choices. In sum,

what a Relevance Theory lens suggests in the examples explored here is that communicators such as Noel can demonstrate exceptional creativity in the tools of communication available to them, in trying to provide evidence for a listener to guide meaning construction. However, the benefits of such creativity can only be realised where communication partners approach meaning construction with an awareness of the potential for such creativity and an openness to the 'loose use' problem-solving such creativity implies.

References

Basil, C. (1992). Social interaction and learned helplessness in severely disabled children. *Augmentative and Alternative Communication, 8*(3), 188-199.

Bedrosian, J., Hoag, L., & McCoy, K. (2003). Relevance and speech of message delivery trade-offs in augmentative and alternative communication. *Journal of Speech Language & Hearing Research, 46*, 800-817. doi: 1092-4388/03/4604-0800

Binger, C., & Light, J. (2007). The effect of aided AAC modeling on the expression of multi-symbol messages by preschoolers who use AAC. *Augmentative and Alternative Communication, 23*(1), 30-43.

Binger, C., & Light, J. (2008). The morphology and syntax of individuals who use AAC: research review and implications for effective practice. *Augmentative and Alternative Communication, 24*(2), 123-138. doi: 790496493 [pii] 10.1080/07434610701830587

Bloch, S., & Beeke, S. (2008). Co-constructed talk in the conversations of people with dysarthria and aphasia. *Clinical Linguistics and Phonetics, 22*(12), 974-990. doi: 10.1080/02699200802394831

Bloch, S., & Clarke, M. (2013). Handwriting-in-Interaction between people with ALS/MND and their conversation partners. *Augmentative and Alternative Communication, 29*(1), 54-67. doi: 10.3109/07434618.2013.767497

Carston, R. (1997). Relevance-theoretic pragmatics and modularity. *UCL Working Papers in Linguistics, 9*, 1 - 27.

Carston, R. (2002). *Thought and utterances: The pragmatics of explicit communication*. Oxford: Blackwell Publishing.

Carston, R. (2006). *Code and inference: The meaning of words in context.* Paper

presented at the Pre-proceeding of the SPRIK Conference. Retrieved 4th July 2009, from http://www.hf.uio.no/forskningsprosjekter/sprik/docs/pdf/proceedings.pdf

Clarke, M., & Wilkinson, R. (2007). Interaction between children with cerebral palsy and their peers 1: Organizing and understanding VOCA use. *Augmentative and Alternative Communication, 23*(4), 336-348.

Clarke, M., & Wilkinson, R. (2008). Interaction between children with cerebral palsy and their peers 2: Understanding initiated VOCA-mediated turns. *Augmentative and Alternative Communication, 24*(1), 3-15.

Clarke, M., & Wilkinson, R. (2009). The collaborative construction of non-serious episodes of interaction by non-speaking children with cerebral palsy and their peers. *Clinical Linguistics and Phonetics, 23*(8), 583-597. doi: 10.1080/02699200802491132

Falkman, K. W., Sandberg, A. D., & Hjelmquist, E. (2002). Preferred communication modes: prelinguistic and linguistic communication in non-speaking preschool children with cerebral palsy. *Int J Lang Commun Disord, 37*(1), 59-68.

Grice, H. P. (1975). Logic and conversation. In P. Cole & J. Morgan (Eds.), *Syntax and semantics: Speech acts* (Vol. 3, pp. 41-58). New York: Academic Press.

Hoag, L., Bedrosian, J., McCoy, K., & Johnson, D. (2004). Trade-offs between informativeness and speed of message delivery in augmentative and alternative communication. *Journal of Speech, Language & Hearing Research, 47*, 1270-1285. doi: 1092-4388/04/4706-1270

Hoag, L., Bedrosian, J., McCoy, K., & Johnson, D. (2008). Hierarchy of conversational rule violations involving utterance-based augmentative and alternative communication systems. *Augmentative and Alternative Communication, 24*(2), 149-161. doi: 10.1080/07434610802038288

Hornmeyer, I., & Renner, G. (2013). Confirming and denying in co-construction processes: A case study of an adult with cerebral palsy and two familiar partners. *Augmentative and Alternative Communication, 29*(3), 259-271. doi: 10.3109/07434618.2013.813968

Light, J. (1997). "Let's go star fishing": Reflections on the contexts of language learning for children who use aided AAC. *Augmentative and Alternative Communication, 13*, 158-171. doi: 10.1080/07434619712331277978

Light, J., Collier, B., & Parnes, P. (1985). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: Part III - Modes of communication. *Augmentative and Alternative Communication, 1*, 125-133.

Light, J., Collier, B., & Parnes, P. (1985a). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: Discourse patterns. *Augmentative and Alternative Communication, 1*, 74-83.

McCall, F., Marková, I., Murphy, J., Moodie, E., & Collins, S. (1997). Perspectives on AAC systems by the users and by their communication partners. *European Journal of Disorders of Communication, 32*(3), 235-256.

McCoy, K., Bedrosian, J., Hoag, L., & Johnson, D. (2007). Brevity and speech of message delivery trade-offs in augmentative and alternative communication. *Augmentative and Alternative Communication, 23*(1), 76-88. doi: 10.1080/07434610600924515

Smith, M., & Connolly, I. (2008). Roles of aided communication: perspectives of adults who use AAC. *Disability and Rehabilitation: Assistive Technology, 3*(5), 260-273. doi: 905849173 [pii]10.1080/17483100802338499

Soto, G. (1997). Multi-unit utterances and syntax in graphic communication. In E. Björk-Akesson & P. Lindsay (Eds.), *Communciating naturally: Theoretical and methodological issues in augmentative and alternative communication* (pp. 26-32.). Västeras, Sweden: Mälardalen University Press.

Sperber, D., & Wilson, D. (1986/1995). *Relevance: Communication & cognition*. Oxford: Blackwell Publishing.

Stephenson, J. (2009). Iconicity in the development of picture skills: Typical development and implications for individuals with severe intellectual disabilities. *Augmentative and Alternative Communication, 25*(3), 187-201.

van der Henst, J.-B., Carles, L., & Sperber, D. (2002). Truthfulness and Relevance in telling the time. *Mind and Language, 17*(5), 457-466.

von Tetzchner, S., & Basil, C. (2011). Terminology and notation in written representations of conversations with Augmentative and Alternative Communication. *Augmentative and Alternative Communication, 27*, 141-149.

Wilson, D. (2000). Metarepresentation in linguistic communication. In D. Sperber (Ed.), *Metarepresentations: A multidisciplinary perspective*. Oxford: Oxford University Press.

Wilson, D., & Sperber, D. (2004). Relevance Theory. In L. R. Horn & G. Ward (Eds.), *The Handbook of Pragmatics*. Oxford: Blackwell.

Figure 10.1. Picture illustration to be described by Noel

Extract 10.1

			Operational processes
1	N	(starts to navigate through system immediately)	*PEOPLE*^{F} <u>everyone</u>^{F} <u>granddad</u> (pause of 8 sec on this symbol but not selected)
2	T	*so who's in this picture?*	
3			*GRANDDAD*
4	N	*"granddad"*	
5	T	*[a granddad!*	
6	R	*very good!] do you remember anything else about this picture?*	
7	N	'no' (vocalizes)	
8	T	*what's granddad doing in the picture?*	
9	R	*do you need a look?*	
10	N	'yes' (vocalizes)	
11	R	(closes popup) *now*	
12			*THINGS*^{F} (7 sec) *CLOSE POPUP* *DESCRIBING WORDS*^{F} (11sec) *BEFORE* (the PCS symbol for 'before' shows two pictures, a person with uncombed hair and a person after combing their hair, with an arrow to the first picture)
13	N	<u>before</u> (word sent to message bar, no speech output activated)	
14	T	*before?*	

15	R	*very like before, ok, yeah, it's very like that*	
16	T	*ok?*	
17	R	*do you want another look?* (shows picture, pointing to elements silently)	
18	N		*HOUSE*^{F} (10sec) *CD*
19	N	<u>CD</u> (word sent to message bar, no speech output activated)	
20	N	*"Granddad before CD"* (activates the message bar)	
21	T	*granddad before CD?*	
22	N	'no' (moves head)	
23	R	*no? not quite? Ok. Do you want me to get rid of CD?*	
24	N	'yes' (vocalizes)	
25	R	*ok* (clears CD from display, shows picture again)	
26			*DESCRIBING WORDS*^{F} (4 sec pause on *OLD)* *PRETTY*
27	N	*"pretty"*	
28	T	*pretty? Huh?... so, granddad before and pretty, ok ...*	
29	R	(shows picture again) *do you want to tell her about that?*	
30			*ACTION WORDS*^{F} (CLOSE

			POPUP) *DESCRIBING WORDS*^{F} (scans the blocks on the page several times) *BEFORE*
31	N	before (no speech output activated)	
32	T	*pretty before?* (all laugh)	
33	R	*I don't know what picture T is imagining in her head! What are you imagining?*	
34	T	*there's granddad and he's pretty and it was before … did something happen? … no? … can you tell me anything else about the picture? No?*	
35	R	*can you tell her what granddad's doing?* (6sec)	
36	T	*what's he doing?* (4 sec)	
37	R	*you're allowed to use the exact words in this one to tell her exactly. Tell her exactly what he's doing and see can she get that picture in her head*	
38	N		*QUICK CHAT*^{F} *GAEILGE*^{F} (a folder of Irish vocabulary)
39	N	*"gaeilge"* (meaning Irish)	
40	R	*as Gaeilge?* (meaning 'in Irish?') *Ok?*	
41	T	*as Gaeilge? Now you're really going to trick me!*	
42			*AN CORP*^{F} *GRUAIG*

43	N	*"an corp"* (meaning=body) *"gruaig"* (meaning hair)
44	R	*wow! Yeah, gruaig*
45	T	*hair, uhuh*
46	R	*and is there anything else?*
47		*BEAL*
48	N	*"béal"* (meaning mouth)
49	T	*mouth? Ok … what's happening to grandad's hair and his mouth? (4sec) what's he doing?*
50		*FIACLA*
51	N	*"fiacla"* (meaning=teeth) *"fiacla"*
52	T	*oh, his teeth? Oh, (laughs) I'm creating all pictures in my head here N. So grandad's doing something with his hair and his mouth and his teeth?*
53	N	'yes' (vocalizes)
54	T	*is he washing his teeth?*
55	N	'yes' (vocalizes)
56	T	*is he?*
57	N	'yes' (vocalizes)
58	T	*are you sure?*
59	N	'yes' (vocalizes)
60	N	'yes' (vocalizes with emphasis)
61	T	*and is he combing his hair?*

62 N ‘yes’ (vocalizes)

63 T *he’s going to become all pretty after he does that is he?*

64 N ‘yes’ (vocalizes)

65 R *are we ready to show the picture?*

66 N C: ‘yes’ (vocalizes)

Time taken 6 min 54sec

Extract 10.2

			Operational processes
1	N		*POWERCHAIR NEWS*[F]
			WHEELCHAIR
2	N	*"I got my powerchair a few weeks ago"*	
3	T	*did that happen in the video?*	
4	N	'Yes' (vocalizes)	
5	T	*was the video about you in your powerchair?*	
6	N	'Yes' (vocalizes)	
7	N	'Yes' (vocalizes)	
8	N	'Yes' (vocalizes)	
9	T	*are you sure?*	
10	N	'Yes' (vocalizes)	
11	T	*yeah?*	
12			left
13	N	*"I can go left"*	
14			right
15	N	*"I can go right"*	
16	T	*and was that shown on the DVD?*	
17	N	'Yes' (vocalizes)	
18	N	'Yes' (vocalizes)	
19	T	*yes?*	
20	R	*and is there any more you want to say?*	

No? that's it? OK

Time taken: 1 min 5 sec

Context: Noel has viewed a video where a young girl in a power wheelchair drove her wheelchair on a path and did a 360degree turn before stopping