

Formulaic Language as a Barrier to Effective Communication with People with Alzheimer's Disease

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Abstract: Carers recognize that the linguistic problems associated with Alzheimer's disease (AD) can be detrimental to effective communication, but they are often not sure what they can do to help. This article examines the use of formulaic language in AD, including routines, repetitions, and fillers, through the lens of a model of how cognitive and social priorities shape language learning and use. The model sheds light on the ways in which formulaic language can limit effective communication, but also shows how it can be used to support the declining command of novel language. Carers' tendency to adopt formulaic language in their own interaction is also examined. An agenda for future research is offered to further test the validity of these observations and to explore ways of using formulaic language constructively to support improved communication between carers and AD sufferers.

Keywords: Alzheimer's disease, discourse strategies, formulaic language, holistic processing, multi-word strings

Résumé : Les membres du personnel soignant conviennent volontiers que les problèmes langagiers associés à la maladie d'Alzheimer peuvent nuire à l'efficacité de la communication, mais dans la plupart des cas, ils ne savent pas comment aider leurs patients. À partir de l'observation, faite sur des patients atteints de cette maladie, de la façon dont les priorités cognitives et sociales modulent l'apprentissage et l'utilisation de la langue, l'article analyse le recours à des séquences linguistiques préfabriquées telles que routines, répétitions et mots de remplissage. Le modèle utilisé jette un éclairage nouveau sur les contraintes imposées à la communication par les séquences préfabriquées, et montre également comment celles-ci peuvent servir à ralentir la régression de l'usage original du langage. La tendance chez les soignants à adopter des séquences préfabriquées dans leurs interactions personnelles est également prise en compte. Nous proposons par ailleurs un programme de recherches, dans le but de mettre encore à l'épreuve la validité de nos observations et d'explorer les manières constructives d'utiliser les séquences préfabriquées afin qu'elles améliorent la communication entre les soignants et leurs patients atteints de la maladie d'Alzheimer.

Mots clés : maladie d'Alzheimer, stratégies discursives, séquences préfabriquées, processus holistiques, séquences multitermes

A recent study of communication in care homes for the elderly reported that 'the typical person in a home spent only two minutes interacting with staff or other residents over a six hour period of observation, excluding time spent on care tasks' (Alzheimer's Society, 2007, p. v). The same report confirmed that 'care staff perceive communication problems as one of the biggest challenges in providing good dementia care' (p. 4). At first glance, it might seem that the problem is all on one side, since it is the people with Alzheimer's disease (PADs) who experience language problems. However, communication is a two-way process, and carers can bring their own perceptual and linguistic challenges to the situation. In conversation, staff working with dementia sufferers – including doctors, nurses, speech and language therapists, and daily carers – admit that their understanding of how language might be operating in Alzheimer's disease (AD) is often shallow, linguistically ill-informed, under-theorized, and disjointed. Furthermore, the demands of working in a busy environment can create a conflict between meeting the physical needs of PADs and finding time to talk to them, particularly when conversation is laboursome. This article reflects on the role of formulaic language in PADs' and their carers' speech as it creates both barriers and potential gateways to effective and enjoyable communication. An agenda for future research is laid out, which could result in material improvements in the quality of interaction experienced in the context of AD.

Language in Alzheimer's disease

Alzheimer's disease is a degenerative condition that affects memory and cognition. The language used by people with AD presents a valuable window into the role of memory and online processing in the construction of language. The key language-related features of AD include the following (National Institute on Aging, 2009):

Mild AD: Has trouble finding words; may substitute or make up words that sound like or mean something like the forgotten word; may stop talking to avoid making mistakes; asks repetitive questions.

Moderate AD: Continuously repeats stories, favourite words, statements; cannot organize thoughts or follow logical explanations; has trouble following written notes or completing tasks; makes up stories to fill gaps in memory; may be able to read but cannot formulate the correct response to a written request.

Severe AD: Speaks in gibberish, is mute, or is difficult to understand.

However, such simple lists obscure the episodic nature of the trajectory of decline for an individual, who will have good and bad days. It should also be noted that language is not just a symptom of the stage of the condition but also a major way in which that stage is defined. There is, as a result, a risk of circularity in discussing the relationship between the two. Furthermore, as explained below, the language produced by a PAD might appear to involve more grammatical processing and lexical retrieval than it actually does, obscuring the extent of the speaker's available linguistic capacity.

Opinion varies as to whether linguistic changes are essentially secondary consequences of other aspects of decline (see, for example, Bayles, 2004) or are independently motivated (Grossman, 2004). PADs' word-finding difficulties can be attributed to general memory impairment, much as the tendency to repeat questions likely reflects the lost capacity to create episodic memories (Cullen et al., 2005). In a similar vein, the repeated use of phrases tends to be viewed as one aspect of more general perseverative behaviour in AD (Nyatsanza et al., 2003), which is associated with the cognitive and emotional consequences of damage to neurotransmitters (Asp et al., 2006).

Repetition and phrase overuse are usually construed as excessive, unnecessary, and undesirable. However, there may be a less negative side to the use of familiar strings of words in AD. PADs might be able to harness them in the service of aspects of communication that might otherwise be too difficult. There is certainly evidence that over-learned phrases can play a positive role in PADs' communication in certain contexts. Snowdon (2001, p. 22) observed that nuns with AD who 'could barely articulate a sentence ... managed to answer the priest with appropriate responses,' a capacity of considerable value to them as religious sisters. Similarly, Wray (2010) reports that a renowned singing teacher with AD drew on her stock of long-known, teaching-related expressions to sustain a master class over an entire weekend. Furthermore, the production of 'common social phrases such as *I don't care* and *I don't know*' even in the advanced stages of AD (Bayles, 2004, p. 292; for further examples, see Hamilton, 1994, pp. 65–66) invites consideration of how PADs may co-opt certain

kinds of language they can access to fulfill their most urgent communicative needs (Ramanathan, 1997).

A brief examination of a short example illustrates some of these points:

Excerpt 1 (Asp & de Villiers, 2010, p. 183)

And then she'd turn right around and disconnect what I had been talking about and I mean she's everybody used to think you know I'll be luck if I'm doing that or I'll be lucky if I you're not lucky girl you've had it.

The speaker is a 76-year old woman with moderate AD symptoms (Asp & de Villiers, 2010, p. 5). Even these few lines illustrate repetition (*I'll be luck, I'll be lucky, you're not a lucky girl*), fragmentation of ideas, unexpected lexis (*disconnect*), referential vagueness (*if I'm doing that, what I had been talking about*), and fillers (*and then, I mean, you know*).

One clue to what happens in AD language is the fact that formulaic language is also observed in several other conditions and situations in which full expression through language is in some way compromised. Such circumstances include first language acquisition (e.g., Bannard & Lieven, 2009; Peters, 1983), second language acquisition (e.g., Wong Fillmore, 1976, 1979), various types of aphasia and other acquired language disorders (e.g., Paul, Van Lancker-Sidtis, Schieffer, Dietrich, & Brown, 2003; Van Lancker, 1987), and autism (e.g., Roberts, 1989). As a result, we should seek an explanation that accommodates in as straightforward a manner as possible the tendency for language patterns to converge in this range of challenging conditions.

Examining the nature of formulaic language

The repetitive and routinized language used by people with AD constitutes one sub-part of formulaic language, a larger phenomenon observed in normal linguistic behaviour. Formulaic language – and the countable instances of it termed *formulaic sequences* – can be broadly defined as strings of words that have a particular holistic status (Wray, 2002, p. 9). This status may reside in a meaning that is not fully derivable from the parts (e.g., *high time, come of age*, and the majority of 'true' idioms such as *take it on the chin*), or in a grammatical form that is unconventional (e.g., *go great guns, you pays your money you takes your choice*). Alternatively, the expression as a whole may have its

own function, as with routine expressions (e.g., *see you later, thank you very much*), or a layer of additional pragmatic weight (e.g., *I don't think so!*). An increasing number of researchers also regard common turns of phrases as formulaic. These are simply the native speaker's preferred way of expressing an idea that could, in theory, be expressed in other ways (e.g., *take a look at, health and safety*). These expressions are characteristically shared across a speech community, though individuals may also use expressions to mark themselves out from others, perhaps expressions associated with another community to which they have belonged (e.g., childhood dialect), something they once heard from an influential friend or relation, jargon expressions from their work, or a phrase they once coined and still find useful. Other commonly recognized sub-types of formulaic language include filler phrases (e.g., *you know*), rhymes, songs, proverbs, learned expressions in foreign languages (e.g., *c'est la vie*), and quotes, including repetitions of others' and one's own previous speech.

There are deep-rooted challenges in reliably identifying word-strings as formulaic in real spoken and written texts (see Wray, 2002, 2008a, 2009, for extensive discussions of this issue and how it can be resolved; see Wray, 2008a, Chapter 9, for a practical criterion-based approach to identification). In corpus-based research, a different solution is operationalized – a frequency threshold, such that the 'lexical bundle' is defined as a word-string of a certain length that occurs more than a certain number of times per million in the corpus (e.g., Biber, Conrad, & Cortes, 2004).

The precise relationship between frequency and formulaicity is unclear, however, and nowhere more so than in AD language. For instance, Joan (Wray, 2010) made repeated use of some personal turns of phrase, such as *tip of the tongue to teeth* and *because it makes such a lot of difference*. They had a clear interactional function, they were frequent in her usage, and there was no evidence that they were newly constructed at the time of use. Yet, they would not reach the threshold for identification as lexical bundles in a general corpus of English.¹

It is a notable curiosity that formulaic language is ubiquitous in a range of different language disorders including AD and autism (Wray 2008b), and, best documented, aphasia (see Van Lancker, 1987, for one useful overview). Yet not all types of formulaic sequence are equally resilient. In AD language, while routine expressions, rhymes, songs, and fillers are commonly retained and repetitions of a previous utterance are also common, the holistic, non-literal meanings of idioms are not easily understood (Papagno, Lucchelli, Muggia, & Rizzo, 2003) and it is not clear that proverb knowledge is well-retained (Lindholm &

Wray, 2011). Understanding the roles of formulaic language in AD therefore requires some consideration of the distribution of different types, and this entails adopting a theoretical model of how formulaic language fits into language and communication more generally.

Locating formulaic language in a theoretical model

The definition of the formulaic sequence offered by Wray (2002, p. 9) states that it 'is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language grammar.' In other words, Wray, in line with many before, adopts the position that we can store in our mental lexicon not only morphemes and words but also multi-word strings.

The idea that the lexicon contains multi-word units has a considerable impact on how the linguistic system is conceptualized. The streamlined, atomic lexicon of classic generative grammar models outlaws any item that can be constructed by rule from smaller lexical units, and such a lexicon will only admit fully non-compositional idioms such as *double Dutch* and *well off*. But what counts as a rule-based configuration? Are there rules to predict limited sets, such as 'go' as a transitive verb (e.g., *go great guns*, *go the whole hog*) and noun-adjective pairings (e.g., *battle royal*, *heir apparent*, *devil incarnate*, *body politic*), or are these limited sets simply stored complete? How should layers of meaning that affect only the whole and not the parts be accommodated if not through a holistic marker? And how legitimate is it, within one's theory, to increase lexical storage to save processing effort?

Recently, several grammatical theories have found ways of accommodating formulaicity by conceptualizing the entire grammar around usage and frequency, rather than around abstract rules. *Pattern grammar* (Hunston & Francis, 2000), *emergent grammar* (e.g., Hopper, 1998), and *construction grammar* (Goldberg, 2006) all allow meaning to be conveyed within a structure, somewhat independently of the content lexis. By deprioritizing the role of the individual lexical item in determining meaning at the phrasal level, it becomes much easier to explain how a multi-word string can have a meaning that is partly or entirely different from the meanings of the component parts. A useful additional effect is that novel uses of words can be explained in terms of existing semantic frames. For instance, *she negotiated her way to the shop* successfully conveys the information that she *went* to the shop, even though there is no verb of movement in it.

Usage-based models offer a plausible account of the operation of formulaic language, though they can display ambivalence about how form-meaning relationships arise in the first place. Frequency of use as the basic cause of the patterns is often as much inferred as demonstrated, and it has been argued (e.g., see Wray, 2008a, p. 83) that other variables must also be taken into account, including salience – how important the message is – and *relative* frequency – that is, how often a particular configuration is used relative to the number of opportunities to express that message.

Evidence for how formulaic language is processed and stored

It may seem that the best way to decide between theories is to test them against empirical evidence of how processing works. However, experimental approaches do not necessarily provide definitive information. Even the question of whether words like *rejuvenate* and *unhappy* are stored whole or as a stem and prefix has remained a matter of discussion for several decades (Aitchison, 2003, pp. 112–114). Nevertheless, there is an increasing body of evidence which indicates that formulaic language enjoys privileged processing. For instance, Tremblay and Baayen (2010), measuring the electrical activity in the brain during language processing, found that lexical bundles such as *in the middle of* were processed faster than equivalent bundles of lower frequency. The speed at which they were processed was too fast for each word to be accessed separately and this, they claim, ‘suggests that (at least some aspects of) regular four-word sequences are retrieved in a holistic manner’ (p. 170). As noted earlier, it is not clear whether observations about lexical bundles, defined in terms of frequency, can be directly transferred to other types of formulaic sequence.

Sivanova-Chanturia, Conklin, and Schmitt (2011) tracked and timed eye movements during reading. In a confirmation of earlier results (Conklin & Schmitt, 2008), they found that native speakers processed idioms such as *at the end of the day* faster than non-idiom equivalents such as *at the end of the war*, though non-native speakers did not. Ellis, Simpson-Vlach, and Maynard (2008) found that native speakers had accelerated processing for word-strings with high mutual information (MI) scores – that is, where each of the words frequently occurred with the other (relative to their occurrence with other words) – while non-native speakers had faster processing for word-strings that had a high absolute frequent as a combination. Millar (2011) tested native speakers on typical non-native collocations produced by learners and found that they processed them more slowly

than native-like collocations. Again, it is not clear whether findings about idioms, the most semantically striking type of formulaic language but one of the rarest in use, can be applied to all other types of formulaic language, though it is generally assumed that they can. Idioms are selected for experiments because they are viewed as one of the most reliable archetypes of formulaic language.

Insofar as these experimental findings can be generalized to the intermediate types of formulaic language – those neither very frequent nor very semantically marked – they raise some important questions in relation to a more central explanation of what formulaic language is and how it is used. The first concerns why, across several studies, non-native speakers and native speakers are found to process formulaic sequences differently. The second is whether there are consequences to that difference. This matters in the context of AD because, in many countries, a significant proportion of carers are not native speakers of the language used by the people for whom they care. Millar (2011, p. 136) proposes that ‘learner failure to use the appropriate formulaic sequence will create greater processing demands for the [native speaker] addressee.’ What impact might this have on the language behaviour of carers, and how might those with AD respond?

The third question regards the capacity of these experiments to inform our understanding of the role played by frequency in creating formulaic language and thus the extent to which we might expect frequency to account for the formulaic expressions that are still available in AD. It was noted earlier that some types of formulaic language are either characterized, or specifically defined, by their frequency of occurrence in the language. Yet idioms, though classically formulaic, are far from frequent (Moon, 2006). Tremblay and Baayen (2010) and Ellis et al. (2008) both successfully contrasted the processing of frequent and less frequent configurations. So, is frequency a determinant of formulaicity or not?

One possible answer is that we have both fast-track serial processing and holistic storage. The former would be brought about by the repeated use of the same neural pathways (Ellis & Frey, 2009) and would thus directly produce frequency. The latter would arise not from frequency but from salience – that is, consistent mapping between meaning or function and form. This double explanation is not elegant, however. Nor does present experimental evidence offer convincing backing for it since it is difficult to differentiate very fast access from instantaneous access (Tremblay et al., 2011).

Perhaps more challenging yet is the meta-theoretical question of just what either explanation truly signifies in relation to the real world.

Both holistic storage and serial access are simplified metaphors for the actual neurological activity in the brain. This consideration, along with the fact that our current approaches to measuring frequency are insensitive to the linguistic experience of individual language users and are bound to count what can be counted rather than what might be most important (e.g., the frequency of occurrence of a word-string in relation to the number of opportunities for it to occur), reminds us that there is still a long way to go before we will understand how the patterning of language comes about.

An alternative explanation for formulaicity

If, as suggested above, raw frequency is not the only determining factor of formulaicity, something else must be playing a part too. In what follows, the explanation adopted is that presented by Wray (2002) because it not only offers a means of accounting for why both frequent and infrequent formulaic sequences exist, but also accommodates the evidence that non-native speakers respond differently from native speakers in experiments. The model is briefly outlined below, with the focus particularly on the parts most relevant to the main purpose of this article, namely to establish a basis for understanding the roles of formulaic language in AD communication.

Wray's (2002) model, also summarized in Wray (2008a, Chapter 2), accounts for the formation and sustaining of formulaic language as a function of two dynamic components. One is a cognitive drive on the part of the speaker to minimize processing. This drive comes about because the linguistic system of words and rules evolved by humans is not a good match for our cognitive abilities. Our short-term memory capacity constrains the potentially infinite length and complexity of sentences, while our limited ability to track independent objects restricts the semantic complexity of sentences (Hurford, 2007). It follows that all language users may experience conflict between their expressive ambitions and the elasticity of the cognitive support for language – how much they can hold in memory while they construct their utterances (Wray & Grace, 2007). Formulaic language is used as a means of coping with this overload. It can provide a large unit, containing more information, for little effort. And it can help sustain the flow of speech when dysfluency threatens. Thus, we use filler phrases such as *you know* and *I mean* to hold the turn while we plan what to say next, and experienced interviewees such as politicians can draw on a repertoire of expressions to perform the same function (e.g., *I'm really glad you asked me that* and *That's a very important issue*).

The other component is a social drive to manage other people as a way of protecting one's own interests. All humans, but particularly infants during first language acquisition, have limited agency to control their physical environment and their cognitive and emotional experience. Language is a major means by which we attempt to influence others to behave in ways that will be beneficial to us; we attempt to influence others, for example, to give or sell us things, impart information to us, reassure us about our status in their eyes.

The cognitive and social components are connected. While, as a speaker, one can save one's own processing effort by using prefabricated word-strings, there are also benefits in minimizing the processing of the hearers whom one is trying to influence. If intent on producing manipulative utterances, it makes sense to mirror in one's output the linguistic patterns that one knows the hearer will understand – patterns that the hearer has previously used him- or herself. The closer the child can keep to these patterns, the less risk there is that the hearer will misunderstand. Furthermore, if there is a direct form-meaning pairing for the word-string, there is less chance of it being examined for other possible meanings or implications.

Wray (2002) proposes that by this means, the twin driving forces of minimizing processing and promoting one's interests through the manipulation of others lead to a strategy for dealing with linguistic input by which nothing is changed unless it has to be – Needs Only Analysis (NOA):

The process of analysis which the [native speaker] child engages in [is] not that of breaking down as much linguistic material as possible into its smallest components. Rather, nothing [is] broken down unless there [is] a specific reason (p. 130).

Of course, simply copying input will not be adequate for self-expression, and in response to her need to create additional flexibility so as to better meet her communicative needs, the child gradually identifies places where input material can be segmented (Peters, 1983). Segmentation takes place at locations where variation is observed to occur. The result is that the child learns to substitute paradigmatically at precisely those locations where she has observed paradigmatic variation, but she does not precipitately assume that variation is possible anywhere else. This naturally leads to idiomatic linguistic behaviour in that the tendencies within the speech community to favour certain fixed patterns in phraseology will automatically be

adopted by the child along with a sensitivity to the precise scope of variation experienced in input.

By virtue of the parsimonious practice of segmentation according to communicative need, rather than according to an underlying drive to identify all of the possible moving parts of the language, the child accumulates in her lexicon a mixture of units to which meanings and/or functions can be assigned, ranging from completely fixed multi-word expressions – quotes (e.g., *What's up Doc?*), routines (*thank you mummy for a lovely dinner*), and songs, through partly fixed frames (e.g., *I want some ___; I don't want you to ___*), to separate words, particularly common nouns and morphemes. In short, the child assembles in her lexicon the set of units that can most economically contribute to the construction of utterances like the ones she has encountered from others, this being simultaneously a means of minimizing her own processing effort and ensuring, as much as possible, that even when she expresses an idea that no one has ever thought of before, the decoding procedure will be as simple as possible for the hearer.

In the process by which new learners adopt the patterns of the speech community, a secondary effect occurs whereby formulaic sequences become a gesture of inclusion by marking the speaker as a member of the group familiar with the expression and, by implication, also marking the hearer as one of the people expected to recognize and understand it. Conversely, the deliberate use of jargon with non-initiates then becomes a distancing mechanism. Our language knowledge is thus shaped into a relief map of socio-interactional signals between users so that we are obliged to master different styles, registers, dialects, and, indeed, different languages if we are to ensure a secure place in the different speech communities in which we seek acceptance.

The processes of NOA are attested in linguistic patterns observed in ordinary first language acquisition (Bannard & Lieven, 2009) and they also occur in early childhood second language acquisition (Wong Fillmore, 1976, 1979). In both cases, the underlying motivator described above, that of self-protection and self-promotion, can be observed in the adoption of adult-like multi-word strings for the purpose of manipulation (e.g., Ellen's approximation, aged 1 year 9 months, of *time for a cup of coffee?* as a request for a biscuit [Wray, 2002, p. 107]). The formulaic mechanisms used to integrate into a group of native-speaker peers were, for Wong Fillmore's 5- to 9-year-old second language learners, one of the most powerful drivers (see also several examples in Wray, 2002, Chapter 9). Meanwhile, evidence that

segmentation has to be learned, and that it is learned in response to a developing need for flexibility in interaction, comes from observations of language acquisition in autism, where the capacity to substitute pronouns in echolalia is a significant sign of communicative development (Roberts, 1989).

Although NOA is primarily conceptualized in relation to children's language acquisition, it never stops operating because the underlying drive for self-promotion and self-protection continues through life. However, an adult's experience of learning a new language is very different from that of a child. First, even in a naturalistic or immersion setting, an adult has considerably more agency in relation to meeting basic needs: money, mobility, pragmatic knowledge, and a first language. These will jointly reduce the necessity on the part of the learner to adapt input in a way that maximizes the chances of manipulating the hearer. Second, in a classroom setting adult learners tend to be focused on meeting other kinds of needs, including mastery of the abstract linguistic patterns required for completing tasks and passing exams, which rarely prioritize effectiveness in communication over accuracy. Consequently, when adult learners analyze according to their need, they tend to segment more and end up with smaller lexical units. Indeed, their decisions about where to segment are likely to be driven by other considerations than where they have observed variation, and they may make broader, unattested assumptions about which items in their lexicon can legitimately (i.e., idiomatically) be substituted paradigmatically.

Thus, Wray (2002) proposes that many of the errors displayed by adult language learners are the product of combining small units in ways that perhaps ought, logically, to be possible, but which simply are not part of the idiomatic native language patterns. Returning to the experimental finding reported above that non-native speakers do not have a processing advantage for idiomatic word-strings over non-idiomatic equivalents, NOA explains this in terms of the over-analysis of input in post-childhood learners – they are less likely to have retained a memory of the larger unit in its own right and therefore have to process it piecemeal, which takes longer.

Turning now to speakers with an acquired cognitive impairment such as AD, it is possible to ask some important questions of the Wray (2002, 2008a) model:

1. Can the increased use of formulaic language observed in AD be attributed to the pressures arising from reduced cognitive capacity?

2. Why might PADs use the 'wrong' formulas for a routine situation (Hamilton, 1994; Wray, 2010)?
3. Can the subset of types of formulaic language typically observed in AD (e.g., routines, repetitions, fillers, songs) and the absence of others (e.g., idioms, proverbs) be explained?
4. How would Wray's (2002) NOA model predict hearers to respond to PADs' formulaic language?

Interpreting formulaic language in AD as a response to cognitive and social pressures

Can the increased use of formulaic language in AD be attributed to pressures arising from reduced cognitive capacity?

The model offers an explanation for why native speakers prefer certain word-strings to others with the same meaning, how and why the knowledge is accrued, and how it is perpetuated. As observed earlier, even in normal adult native speakers' usage there can be short-falls in fluency and/or grammatical or semantic coherence arising from over-ambitious propositional content at the conceptual level. In such circumstances, formulaic language patches the gaps, providing a fast-track selection route for complex ideas that have been encoded in the past, buying time for planning and filling spaces to promote fluency. Fluency is important because speakers who cannot sustain it are likely to be interrupted or overlooked, which undermines their capacity to self-promote and achieve the things they need for their own comfort and well-being.

Perceiving formulaic language as a patching mechanism (though it is not *only* that) offers an explanation of its ubiquity in the language of PADs since, as cognitive dexterity and memory capacity decline, more patching will be needed. PADs draw on the lexicon they developed during their lifetime to find the least demanding units with a meaning suitable for the present needs. This process is well-exemplified in Wray's (2010) study, where Joan used general filler expressions in place of the specific detail she was unable to express:

Excerpt 2 (p. 523)

So that you do that, darling

It makes it go on like that all the time

It's that kind of feeling, you know, of doing it

You've got to watch the high note that's got the feel of it, this business.

As noted earlier, Joan also used a great many personal turns of phrase that expressed key ideas from her professional sphere (e.g., *tip of the tongue to teeth*), though, since she was no longer able to explain them in other terms, for some listeners they amounted to inexplicable jargon.

Second, PADs may shy away from the more effortful aspects of communicating meaning and, finding they are often misunderstood anyway, increasingly withdraw from the attempt to communicate their real needs and thoughts because it is simply too difficult to see the process through. In such cases, formulaic language can be used to deflect responsibility, as with *you tell (her)*:

Excerpt 3 (Davis & Maclagan, 2010, p. 205)

MM: How long were you in hospital? Were you there a lot?

MB: Several time and – um you tell her (*addressed to her daughter*).

Excerpt 4 (Davis & Maclagan, 2010, p. 205)

MB: The nurses and staff – had you in hospital but – oh you tell (*addressed to her daughter*).

Carers and family members, with their own complex responses to the situation (discussed below), may conspire in this development. They may lack the time or patience to encourage painstaking novel communication, increasing the PADs' tendency to offer formulaic responses or defer engagement. In due course, carers may fail to expect novel information, and when it is produced they may not responded to it appropriately, preventing PADs from expressing aspects of their personality (Lindholm & Wray, 2011).

The model assists further in understanding two additional aspects of AD language that relate to cognitive load. One is that, despite plenty of evidence for it in discourse-oriented studies (e.g., Asp & de Villiers, 2010; Davis & Bernstein, 2005; Davis & Maclagan, 2010; Hamilton, 1994; Wray, 2010), formulaic language tends *not* to feature much in reports of formal experimental and clinical testing and may be generally elusive in that kind of study. There is no reason to

doubt that the patterns of deficit observed using formal tests are valid markers of AD, but many of them fail almost entirely to examine language as more than a detached encoding and decoding system within which formulaic language will rarely be triggered given its social orientation.

The other issue regards the challenges of using linguistic behaviour to contribute to a diagnosis of AD. As should be evident from the discussion so far, formulaic language has the potential, in discourse terms, to be a sign both of abnormality and of continuing normality. It also potentially muddies the waters in relation to underlying grammatical and lexical ability since a formulaic word-string, retrieved with relative ease, might contain within it words and structures no longer under separate control. For instance, Excerpt 1 above can be easily divided into a sequence of common formulaic expressions:

Excerpt 5 (Asp & de Villiers, 2010, p. 183)

[And then] [she'd] [turn right around] and disconnect [what I had been [talking about]] and [I mean] [she's] [everybody used to] think [you know] I [I'll be luck(y) if] [I'm doing that] or [I'll be lucky if I] [you're not lucky girl] [you've had it].

We cannot, of course, be sure whether this is an appropriate way to interpret the utterance in production terms, but it does illustrate how the assembly of multi-word lexical choices might result in relatively fluent output that has a semblance of coherence and accuracy because of the internal content of those units, while the overall semantic structure is more tenuous because the speaker cannot easily keep track of the progression of ideas. And if little cognitive effort is required to produce a phrase such as *VERB what I had been talking about* because it is a formulaic frame or fixed string, the speaker has given no evidence of having the mastery to embed clauses using a relative pronoun.

Why might PADs use the 'wrong' formulas for a routine situation?

Language production entails identifying the components required for expressing the desired message within the mental lexicon. Of course, in normal circumstances, adult native speakers will have plenty of resources for creating an accurate compilation of larger and smaller units to precisely match their intended message, complete with fine-grained choices about register and pragmatic weight. However, in less ideal cases we should see compromise.

We might liken the PAD to a travelling odd-job worker hoping to find in his portable kit some kind of tool that is adequate for the task in hand. While his customer bemoans the worker's dearth of tools, the worker might equally well congratulate himself on completing the job by imaginatively redeploying the tools he does have. In a similar way, the PAD attempts to express a message but finds that the lexical units that would normally be used cannot be accessed. The selection of another item constitutes a reasonable compromise that solves an immediate problem and rescues the interaction.

If this proposition has any validity, it should be possible to find some sort of pattern in 'incorrect' choices. Wray (2010) presents examples of Joan appearing to break the rules of turn taking by asking questions and not waiting for them to be answered before continuing to speak:

Excerpt 6 (p. 528)

How do you feel? Up to those lovely top notes and everything like that.
How do you want them to work? So they ... ((*she continues*)).

Excerpt 7 (p. 528)

Now darling, how are you doing? Not too bad. French alright. Then when you get to the top notes, so you do more of that, doing it all the time.

Wray (2010) suggests that Joan is actually not breaching turn-taking conventions. Rather, Joan has selected the wrong formulaic sequence for opening her turn. Some of the turn openers in her repertoire are questions and others are not. She does not need a question opener here, since she has more to say after it. However, her selection is at least from the class of openers, and is thus a reasonable substitute for what she needed.

The use of the 'wrong' formulas to deliver the desired message is also seen in Excerpt 8. Meg draws on expressions to which she has access, first to request assistance from Clegg (who is recording her language at the time) and then to express thanks:

Excerpt 8 (Clegg 2010, pp. xix–xx)

Meg is trying to remove a plastic apron, which has become knotted tightly round her neck and fingers

I can't properly ... I don't know ... I don't know ... I don't know ...
good night ... good night ... good night

I remove the apron

Thank you ... thank you ... for helping me ... one thousand times thank
you ... you're a nice lady ... I'll write to you privately. You're my brother!
Will you see me home now? ...

*Can the presence of some types of formulaic language and the absence
of others be explained?*

Different predictions will be made about the relative resilience of formulaic sequences depending on the theory used to explain them. For instance, if frequency is considered to determine the strength of a sequence's presence, we should anticipate that the most frequent word-strings will be most persistent. On the other hand, if salience in relation to meaning and/or function in social interaction is seen to play a major role in determining formulaicity, then we should predict that the formulaic sequences still available in AD will be those that have the most significance to the PADs' needs and interests. This is an empirical matter for future research, since it should be possible to differentiate, albeit in only a rough way, between frequency and salience as predictors of observed behaviour.

Regarding the reduced capacity to interpret idioms (Kempler, Van Lancker, & Read, 1988) and complete proverbs (Lindholm & Wray, 2011), the first thing to note is that the idioms used in empirical studies tend to be highly figurative (e.g., *skating on thin ice; pay an arm and a leg for something*) rather than the sort of lower grade idioms that would be more likely to occupy their own semantic or pragmatic space (e.g., *turn [a situation] around; give [something] a go*). The tested idioms are therefore usually both low frequency and rarely, if ever, the primary way of expressing an idea. That leaves little to choose between the frequency and salience explanations for the difficulties with interpreting them. In either case, it is likely that the specific social roles played by idioms and proverbs in communication are no longer salient to PADs, rendering them of little use, while the PADs' reduced cognitive capacity will cause difficulty in holding competing literal and figurative interpretations in memory long enough to use context or cotext to decide between them (see Wray, 2008b, for a review and discussion).

As for the resilience of routines and fillers, the semantic/functional explanation for their retention is easy to justify, while the case for a frequency explanation awaits detailed empirical work on the relative incidence of different attested items. Songs are a more difficult case. One might certainly argue that knowing by heart the words of a song reflects a considerable measure of repeated exposure to them at some point in the past. Why songs should be retained for communicative reasons is less clear, though they may resonate strongly with earlier periods of life and thus represent an anchor into self-identity.

Finally, verbal perseverations, such as asking the same question many times or repeating the same phrase, can reasonably be interpreted non-linguistically – that is, as evidence of poor immediate episodic memory. But since Wray's (2002) model proposes that the infant imitates input to gain power in an alien world, it is also possible that self-imitation and the imitation of others perform a primitive function associated with locating oneself in relation to other significant people.

How would Wray's (2002) NOA model predict hearers to respond to PADs' formulaic language?

As noted above, it is generally recognized that formulaic language expresses and develops social roles within a speech community, particularly in relation to signalling identity. In addition, Wray (2002) proposes that much of the formulaic language acquired in the early years is manipulative in nature. A third consideration is that if a multi-word expression is habitually treated holistically within a speech community, it can acquire additional layers of pragmatic meaning that do not belong to the component parts. As a result, there is often no neutral way of using a formulaic expression; yet a non-formulaic equivalent can also be socially marked. This means that anyone forced into using more formulaic language than normal (e.g., a PAD) enters a minefield of unintended implications, while anyone using formulaic language with a PAD may be wrong-footed by the PAD's lost capacity to read between the lines.

Formulaic language is, in normal interaction, a fine tool for nuance, and interpreting nuance as it was intended entails established tacit agreements between the interlocutors, which may not exist between a PAD and a carer, even when the carer is a close family member. The selection of the wrong expression (discussed above) has considerable potential to undermine such agreements and could easily mislead or offend the hearer. Hearers may also be disconcerted by apparently inconsistent evidence of linguistic ability since, as noted earlier, formulaic expressions

often contain accurate grammatical and lexical forms that the PAD no longer independently commands. Furthermore, since in the normal population formulaic responses can characterize inattention or boredom, increased reliance on them by PADs could be misconstrued by family members as a lack of interest in their concerns, leading to insecurities, resentment, and changes in the balance of emotional power.

NOA predicts that carers may respond to this situation by producing their own formulaic language. Carers, including family members, have to find a way of coping with the abnormal behaviour of PADs, which can include a failure to recognize them, expressions of anger, depression, insensitivity to others' feelings, an inability to make decisions, dangerously impaired judgment, false accusations, rudeness, and physical aggression as well as a range of challenging linguistic behaviours (National Institute on Aging, 2009). Despite patience and understanding, those dealing with PADs may find themselves emotionally wounded (National Institute on Aging, 2010), engendering defensive reactions.

Formulaic language can be used as a means of distancing oneself from an interlocutor (Wray, 2002). At various points, carers might (1) use expressions that they know the PAD will not understand but that count as appropriate communicative gestures so they can self-justify as having done everything they should; and/or (2) respond to the sense of dehumanization that arises from being treated disrespectfully or inappropriately by the PAD by using formulaic language to create a detached, automatic approach to interaction, never expressing any new information or personal feelings. Potentially unkind to the PAD as these gestures may be, carers might perceive them as preferable to physical roughness or neglect.

For example, Clegg's (2010) work often records apparent instances of detached formulaicity in carers' interaction with PADs. In Excerpt 9, the carer's second turn begins with an opening greeting and makes little sense given her previous turn. Although the remarks are contextually pertinent, they seem superficial and undermotivated interactionally. Excerpt 10 shows how a nurse responds appropriately but without engagement to Daisy's input (which is part of a frequently repeated routine).

Excerpt 9 (Clegg 2010, p. xxvi)

CARER: Hello Meg . . . That's nice. That's nice. Did you like your breakfast?
(*She picks up the bowl and puts it on top of the piano. Meg mumbles a few words*)

CARER: Good morning, Meg. You look lovely.

Excerpt 10 (Clegg 2010, p. xxiii)

DAISY: Are you my mother?

NURSE (*without turning round*): No, Daisy,
I'm not your mother

DAISY: I'm your daughter ... say I'm pretty

NURSE: You're pretty

There are at least two other reasons why PADs could encounter considerable quantities of formulaic language from their carers. First, it is easy for professional staff to become linguistically institutionalized, using terms and expressions that are jargonistic and impenetrable to the outsider (Rösler, Schwerdt, & von Renteln-Kruse, 2005). The daughter of one PAD related how her mother, told that her hospital room was next to the *nurse station*, believed that she must be on or near a train. While doctors may aspire, with some success, to avoid jargon in medical consultations (Skelton & Hobbs, 1999), they may not always fully recognize which expressions, commonplace and formulaic in their own speech, are unfamiliar to patients.

Second, since care of the elderly is a poorly paid, socially undesirable occupation (Alzheimer's Society, 2007, p. 39), it attracts a large number of immigrant workers who often have poor knowledge of the language used in the care environment. Such learners, forced to interact every day, are likely to use formulaic language as a means of bootstrapping themselves into basic communication (Wray, 2002, pp. 172–176). However, it is common for their learning to become fossilized at a point where they can just about manage, but they still are very non-native-like. The result is a personal kind of formulaic language that they are unable to repackage, but which is often very difficult for others to understand and particularly so for hearers with their own linguistic challenges. Consequently, interaction with a PAD can fail to break into real information exchange and may be bedevilled by pretence, on both sides, at greater understanding than there really is. To the casual observer, such exchanges might appear effective, but they could be frustrating, isolating, and disturbing for both parties. For an outline of the complex interaction of differently motivated formulaic language in the care home setting, see Wray (2008a, pp. 279–284).

Converting a vicious circle into a virtuous one

Communication problems make PADs increasingly vulnerable to exclusion and isolation and make it difficult for them to form

relationships. If care staff do not have the skills to communicate appropriately in this extreme context, PADs are at risk of being neglected and ignored. The effect that a PAD's formulaic language can have in making a carer feel ignored or undervalued, combined with the effect that a carer's formulaic language can have in making a PAD feel under-acknowledged, will easily create a vicious circle. Both the PAD and carer may be increasingly trapped inside repetitive, routine expressions, while the scope for truly meaningful exchange might potentially be compromised from both ends. Creating a virtuous circle from this vicious one requires attention to the complex interplay of PADs' and carers' needs and the training of carers to use their own linguistic resources, however limited, in a manner that opens up rather than closes down opportunities for real communication.

On the positive side, the capacity of formulaic language to carry complex messages at minimal processing cost means that it can help sustain turn taking, convey ideas and emotions, and be an anchor of familiarity and routine. Is there, then, a way to harness it to good use? Research by Davis and colleagues (e.g., Davis, 2006, 2007; Davis & Bernstein, 2005; Davis & Maclagan, 2007, 2010; Moore & Davis, 2002) suggests that there may be. These researchers have used formulaic language creatively to enhance communication with PADs by training carers to harvest piecemeal information and build on it ('quilting') as a means of overcoming repetitive output and by providing carers who are non-native speakers with appropriate, native-like formulaic language that can be used in practical care situations.

Clegg's work (e.g., 2010) also offers a very practical and effective approach to using formulaicity. He visits PADs to record their life stories, which he then writes up and brings back to them. He is thus equipped to feed detailed information back to them once they can no longer easily access it for themselves, enabling them to re-enter a familiar set of memories about which they can then talk (see Excerpts 11 and 12). This is a means by which they can anchor their identity.

Excerpt 11 (Clegg, 2010, pp. 181–182)

Rosa still enjoys listening to parts of her story and finishing off each sentence.

CLEGG: 'We were all happy, my brothers and ...'

ROSA: Sisters! Eight girls and four boys she had [...] ((*she continues*))

CLEGG: 'My mother ruled ...'

ROSA: The roost! You're not kidding. She was a big woman [...] ((*she continues*))

CLEGG: Should I read your story?

ROSA: Yes ... that's nice ... that's good. Start at the beginning.

Excerpt 12 (Clegg, unpublished transcript, January 2011)

They are talking about swimming in the Serpentine lake in Hyde Park, London, in midwinter

CLEGG: Did your husband do it?

SHIRLEY: Husband? Was I married?

CLEGG: You had a house near Hyde Park ... you persuaded your husband not to invest his money in pens.

SHIRLEY: Oh ... aren't you good ... what a good memory ... I remember now ... (*she continues to reminisce*)

The pathology of AD does not result in consistent levels of cognitive and linguistic impairment for all individuals (Prince & Jackson, 2009, p. 6), which is generally taken to mean that lifestyle, including social and cognitive behaviour (Snowdon, 2001; Stern, 2006), can delay the onset of symptoms and/or alleviate their impact. It is within the gift of carers, if appropriately supported and trained, to create the conditions whereby PADs gain and sustain maximum access to their remaining capabilities and are not undermined by self-consciousness (Davis & Bernstein, 2005) or a low sense of agency or personal responsibility (Sabat 2001, pp. 127ff, 147). In short, better communication is linked to greater empowerment, both for PADs and for carers, and if the conditions are right, the formulaic language observed should be associated with getting others to help you change your world, rather than with social distancing and minimal engagement.

An agenda for interdisciplinary research into formulaic language as a barrier and gateway to communication by and with PADs

In this article, Wray's (2002, 2008a) framework for conceptualizing the social and cognitive origins and uses of formulaic language has been used to interpret a range of current evidence from AD language. However, more research is needed to examine in detail the capacity of this model, or indeed any other, to account for the patterns of

linguistic behaviour observed in PADs and their carers. Major research questions that ought to be addressed include the following:

- How is formulaic language used by PADs in different contexts and at different stages of the disease?
- How does formulaic language enhance and/or diminish the scope and success of communication?
- What variables affect the type and amount of formulaic language used in communication with PADs (e.g., carer personality, relationship with PADs, whether the carer is a native or non-native speaker, care context)?
- How might the pathology of AD account for the retention of formulaic language?
- Why are certain examples of formulaic language, and not others, preserved in a PAD's speech?
- What sorts of interventions (especially in relation to formulaic language) might enhance the linguistic experience of PADs and carers?

A further research agenda derives from the relationship between formulaic language and a range of other language-related evidence from AD research. First, Craik, Bialystok, and Freedman (2010) reported that 'lifelong bilingualism confers protection against the onset of AD' (p. 1726). They hypothesize that 'bilingualism . . . contribute[s] to cognitive reserve, which acts to compensate for the effects of accumulated neuropathology' (Craik et al., p. 1726). Since early acquired second languages tend to feature native-like formulaic language (Wong Fillmore, 1976), there may be connections between age of acquisition and the level of cognitive resilience conferred by the use of two or more languages. How might formulaic language feature in explanations of why cognitive reserve and bilingualism (Craik et al., 2010) can reduce or delay the onset of AD?

Second, research into AD in a community of nuns in the US revealed that those who went on to develop AD in old age had lower scores for idea density (information per linguistic unit) and sentence complexity in autobiographical texts written during early adulthood (Snowdon et al., 1996). As noted earlier, formulaic language, if not taken directly into account, could confound measures of linguistic ability because it packages complexity inside easily retrieved lexical units. How, then, might attention to formulaic language in comparisons of pre-morbid and AD language affect the claim of predictive characteristics?

As intimated earlier, clinical testing is unlikely to offer reliable evidence of how PADs use formulaic language in real communication. Rather, two other approaches are to be preferred. The first is a basic observational approach, enabling the gathering of greater quantities of qualitative data to assist in evaluating what the overall shape of AD language is and how it varies in response to local circumstances, including the input of carers. Clegg's (2010) work indicates that it is possible to use the one-to-one, case study approach to assemble data from a wide range of individuals, so that generalizations become possible.

The second research approach is interventional. Sabat (2001, p. 116) observes, 'there can be striking differences in the behavior of persons with [Alzheimer's Disease] depending on the ways in which they are treated and the opportunities that are made available to them to manifest remaining intact abilities.' Research evidence already demonstrates how 'promot[ing] the person as an active participant rather than a passive recipient during communication' (Orange, 2001, p. 242) makes a difference to the experience of both PADs and their interlocutors. Joan in Wray's (2010) study was sustained in her role as an expert by her capacity to manage her own communicative problems with dignity, something in which she was supported by those with whom she was professionally engaged. Clegg's practical interventions reveal the power of drawing on old linguistic information (stories recorded and written down) to make a material difference to the life of a PAD:

Excerpt 13 (Clegg, unpublished transcript, 2010–2011)

Session 7 Shirley seems very excited. She explains that she has been anticipating my arrival and is keen to tell me something.

Session 10 Shirley greets me enthusiastically with open arms.

SHIRLEY: I have something to tell you . . . something on my mind that I need to tell you before I forget . . .

Session 11

SHIRLEY: I've remembered something else for you . . . would you be interested in Berlin?

Session 14

SHIRLEY: Oh David ... you are Mr. ... Clegg ... oh but I don't know where I am ... where I am with my toast (*she waves a triangle of buttered toast*) and my head ... but ... I so enjoy our conversations ... oh ... but ... that's good ... I love to think back through my life ... when do we start?

Interventional research studies by Davis and colleagues (Davis, 2006, 2007) have simultaneously addressed the needs of PADs and those of their native-speaker and non-native-speaker carers by means of training courses that highlight the potential of formulaic language to bridge gaps in communication. There remains, however, huge scope for additional research – research that can increase our basic understanding of how formulaic language both facilitates and prevents effective communication by and with PADs and that can evaluate the impact of practical interventions, directly employing formulaic language in improving the quality of interaction through the promotion of dignity, involvement, and information sharing.

Conclusion

Greater longevity and the post-war population bulge mean that the incidence of dementia worldwide is estimated to be doubling every 30 years. This would result in 65.7 million people by 2030 and 115.4 million by 2050 (Prince & Jackson, 2009). The inevitable social burden of geriatric care means that research must be done now to ensure information and practical tools are in place to facilitate a range of options for families, carers, and PADs themselves. This article has highlighted the role that formulaic language can play in erecting barriers to communication in AD. It has also indicated how formulaic language might contribute to breaking those barriers down. A better understanding of formulaic language in AD could enable those diagnosing AD stages to interpret the linguistic evidence with greater precision by, for instance, not over-estimating grammatical ability and not under-estimating the desire and potential to express views and needs in formulaic packaging. And it could point the way to future potential developments in carer training that maximize effective communication and promote PADs' self-determination.

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Note

- 1 At 155 billion words, the largest searchable English language corpus currently available is Google Books: American English (<http://googlebooks.byu.edu>). The largest strings that can be searched by using the BYU software are 5-grams, and there are 99 occurrences of *such a lot of difference* (0.00064 per million words) and 187 occurrences of *because it makes such a* (0.0012 per million words). The 5-gram *of the tongue to teeth* does not occur at all. For comparison, the five-word lexical bundles of interest to Hyland (2008) occur between 43.7 and 8.9 times per million and Tremblay et al.'s (2011) threshold was five per million.

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