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On the Role of Embodied Cognition in the Understanding and Use of Metonymy

Jeannette Littlemore[1]

Abstract

The majority of the chapters in this book focus on the symbiotic relationship between embodied cognition and metaphor. In contrast, this chapter focuses on the relationship between embodied cognition and *metonymy*. It argues that metonymy is also embodied, but in a different way, and that the social, environmental, dynamic and developmental aspects of embodied cognition can be expected to play an important role in shaping metonymic meaning. It is suggested that the relative transparency of the role played by embodied cognition in metonymy creation is influenced by the presence of movement and emotion, with increases in the amount of movement and emotion leading to increases in the transparency of embodied cognition. Following Deignan, Littlemore and Semino (2013), it is also suggested that the transparency of the role played by embodied cognition is affected by features of the genre (communicative purpose, staging and discourse community membership) and the register (field, tenor and mode).

Key Words

Metonymy, transparency, language, gesture, register.

1. Introduction

A key claim in the embodied cognition hypothesis is that "people's subjective, felt experience of their bodies in action provides part of the fundamental grounding for language and thought" (Gibbs 2003: 2). As other chapters in this book show, it follows from this that some metaphorical expressions will evoke actual bodily responses that correspond to the more basic or 'literal' senses of those expressions. Considerable empirical support has been found for this proposition, with numerous neuro-scientific experiments showing that metaphor comprehension does indeed often have a sensorimotor basis, particularly for those metaphors that have sensory source domains (Feldman & Naranayan 2004; Gibbs 2014). For example, in (1), the word 'grasp' is used metaphorically to mean 'understand':

(1)   Swann displayed a much firmer *grasp* of the significance of socio-economic circumstances

         (BNC: FAY)

Studies have demonstrated that when people hear metaphorical uses of words such as this, sensory-motor responses are triggered that correspond to those that would be triggered when hearing the more literal or 'basic' sense of the metaphors. For example, it has been shown that people comprehend metaphorical phrases, like 'grasp the concept' more quickly when they first make, or imagine making, a relevant bodily action, such as a grasping motion (Wilson & Gibbs 2007). As other chapters in this volume show, expressions such as this rely on correlational, primary metaphors which stem from an initial conflation of a perceptually defined concept and a subjective response to it, which later becomes dissociated (Grady 1997, *this volume*).

However, there have, to date, been no such empirical investigations into the embodied nature of *metonymy*. Whereas metaphor is often defined as involving some sort of similarity

or correlation between the source and target domain or idealized cognitive model (ICM), metonymy involves a relationship of contiguity, or in cognitive linguistic terms, it provides mental access to another part of the same domain or ICM, rather than evoking a different domain or ICM. It has been shown that primary metaphors have a metonymic basis, insofar as they begin life as metonymic extensions from bodily experiences, which are then projected onto abstract domains (Kövecses 2013). There is also work in gesture studies showing that gestural realisations of primary metaphors have a metonymic basis (Mittelberg & Waugh 2009). In these cases, one would expect metonymy to be embodied to some extent, by virtue of its association with embodied primary metaphor. However, no studies of the type described above have been conducted on metonymy when it stands alone, independent of metaphor. The principal reason for this is that metonymy does not relate concrete to abstract concepts in such a clear-cut way as metaphor, and therefore does not lend itself well to this kind of experimentation. We can see this in the following examples of metonymy:

(2)   a.   *Dickens* is full of such characters (BNC: A06)

        b.   you could *boil your vegetables* in the saucepan and *boil the kettle* at the same time (BNC: D8Y)

        c.   when *Germany* defeated *France* and caused lasting resentment (BNC: CLX)

In (2.a), 'Dickens' metonymically represents 'stories written by Dickens', the word 'boil' in (2.b) refers to the water containing the vegetables and the water in the kettle, respectively, and in (2.c) 'Germany' and 'France' refer to the German and French armies. Evidence from eye tracking studies has shown that when faced with metonyms such as these, participants

develop an underspecified, schematic representation of the word's meaning and then home in on the appropriate sense (literal or metonymic) once sufficient contextual cues have been provided (Frisson & Pickering 1999). It is therefore not really relevant to ask whether any full-blown 'literal' meaning of the word is activated, and then to compare this with its metonymic sense—the two senses, or uses, are too close together in the first place. With metonymy, there are different questions to be asked when it comes to the role of embodied cognition.

In order to explore the role played by embodied cognition in the processing of metonymy, it is necessary to draw on an extended definition of embodied cognition which incorporates an understanding of the fact that human cognition is not confined to the individual. Rather, it is shaped by one's physical and social environment as well as one's personal and social history. It is thus environmentally, socially and temporally 'distributed' (e.g. Clark & Chalmers 1998; Semin & Cacioppo 2008; Zhang & Patel 2006; *this volume*: Jensen). The notion of distributed embodied cognition emphasizes the fact that embodied cognition takes place in a world populated by other people and things, and that it changes over time. It has the following three dimensions:

(i) *Environmental embodied cognition* emphasizes the coordination between internal embodied cognition and the physical environment.

(ii) *Social embodied cognition* emphasizes the distribution of embodied cognitive processes across the members of a social group.

(iii) *Dynamic/developmental embodied cognition*, emphasizes the ways in which current cognitive processes are affected by earlier processes, and change over time.

In sections 2, 3 and 4 of this chapter, I look at how each of these features of distributed embodied cognition is involved in the processing and production of metonymy. In section 5,

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I discuss ways in which contextual features, such as genre and register, may affect the salience of embodied cognition within metonymy.

2.   Environmental Embodied Cognition

Environmental embodied cognition emphasizes the relationship between internal embodied cognition and the physical environment. It takes as its starting point the fact that we understand things in terms of what they mean to us and how we can best make use of them or interact with them (Glenberg 1999). In this section, I explore four aspects of environmental embodied cognition that have a direct bearing on the processing of metonymy. These are: affordances, perceptual salience, part-whole processing, and cognitive off-loading.

2.1.   Affordances

A number of scholars have pointed out that when we encounter an object, one of our first (automatic) responses is to think about what that object means to us and what we can use it for. In other words, we think about what the 'affordances' the object might offer us in terms of its purpose and function (Gibson 1979; Glenberg & Robertson 2000). Thus, if we see a chair we perceive of it first and foremost as something that we can sit on; if we see a glass, we understand it first and foremost as something that we can put liquid in, and drink from. This view of the physical world affects the way in which we use metonymy and the direction of the metonymy; the responses to the objects just described involve OBJECT FOR ACTION

and CONTAINER FOR CONTAINED metonymic relationships (e.g. Radden & Kövecses 1999). These relationships license linguistic metonyms, such as 'would you like a glass?' (meaning 'would you like a glass of wine?'). Affordances also license discourse-community specific metonyms, such as the utterance 'you've got a foot there, out to the left', which might be said by one climber to another to mean that there is a hold nearby where they can put their foot. Incidentally, the word 'hold' in this explanation is also metonymic, as it involves an ACTION FOR OBJECT relationship, which reflects a human affordance of the object in question.[2]

There is some evidence to suggest that affordances such as these have a neuro-physiological basis in that they generate corresponding synaptic connections in the brain (Bierwiaczonek 2013). In other words, certain clusters of neurons are specifically designed to relate the physical properties of objects to the most suitable cognitive motor programs that will allow us to interact with them manually in a purposeful way (Cuccio, *this volume*). Thus, when we see a teapot, or even a picture of a teapot, neuro-synaptic connections are activated so that we automatically prepare to take hold of the handle and pour the tea. Strong synaptic connections develop between the sight of the teapot and the action of making tea. It therefore follows that metonymic relationships which involve a link between PERCEPTION AND ANTICIPATED CORRESPONDING ACTION have a clear neurological substrate.

Related studies have shown that if one concept is used to refer to another on a regular enough basis, a synaptic link will form between those two concepts, and this synaptic link will become stronger as the association between the two concepts becomes more conventionalized. For example, fMRI studies have shown that words denoting activities, such as 'smile', 'hit' or 'kick', activate the face, arm and leg regions in the motor and pre-motor

cortex (Hauk et al. 2004). Moreover, as infants, we develop powerful cause-effect relationships, which we then use to infer a cause from an effect and vice versa. For example, Michotte (1963) showed that if people see one object making contact with a second object and the second object then starts to move after a short delay, then they assume that the movement of the second object is the direct result of its contact with the first object, even if this is not the case. Similarly, when we hear a sound related to a particular action, the pre-motor cortex associated with that action begins to fire (Kohler et al. 2002). These synaptic relationships are likely to underlie many RESULT FOR ACTION or CAUSATION metonyms (such as 'the car screeched to a halt'). There is even evidence to suggest that these synaptic connections exhibit some of the characteristics of embodied cognition that were described in the introduction: the activation of a social stereotype has been shown to cause the unintended mimicry of behavior that is strongly associated with the stereotyped group. For example, if people are asked to think about old people, they are more likely to start to walk more slowly (Bargh et al. 1996). This finding suggests that some of the metonymic shorthand that underlies social stereotyping (here SALIENT FEATURE FOR CATEGORY) is embodied, in that it is both perceptual and conceptual.

2.2   Perceptual salience

A second aspect of environmental embodied cognition that is involved in metonymy creation is perceptual salience. When we survey our environment, some features will inevitably stand out more than others. This can be because of their distinct physical features (for example, if they are brightly colored, well delineated or moveable) or because they have particular relevance to us (for example, for a human viewer, in most situations, other

humans are more likely to stand out than animals or inanimate objects). The fact that we are more prone to notice things that are of immediate relevance to us, and that this drives the way we process information, is likely to play an important topic in our understanding of the role played by embodied cognition in metonymy production and comprehension. The phenomenon of perceptual salience explains why, for example, the metonym 'being at the wheel' is readily understood by speakers of English to mean 'driving a vehicle' (Littlemore 2015), though the exact nature of the vehicle that is evoked (be it a car, a lorry, a tractor or even a boat) will depend on both the context and the hearer's previous experience with different sorts of vehicles (Giora 1997).

Perceptual salience also explains for example the choice of the words 'summer' and 'winter' rather than 'spring' and 'autumn' to stand metonymically for the idea of an event occurring year round in the following example:

(3)   She always has a log fire in the hearth, *summer and winter*. (BNC: A61)

Here, summer and winter are more perceptually salient in that they are respectively hotter and colder than spring and autumn, which is presumably why they are chosen as metonymic vehicles (Panther & Thornburg 2012). This phenomenon, in which two or three words stand for a larger entity, is referred to as 'merism' and is typical of ancient Hebrew poetry (Watson 1986: 321).[3] It has been found to be widespread in Chinese (Wu 2014), where, for example, the term 'have young, have old, have tall, have short' means 'people of different ages and heights'. Similarly, 'have long, have short' means 'all lengths' and 'have fat have thin' means 'people of all sizes'. These expressions all focus on the people or objects that would be the most salient in a crowd or in a collection of items because they are the most extreme

instantiations. These extreme instantiations stand for the entire scale. There are also more abstract examples of this phenomenon in Chinese: 'good, bad' is used to refer to 'quality' and 'cold, hot' refers to 'temperature' (ibid.). The semantic interpretation of such expressions can be attributed to metonymic inferences triggered by the co-occurring antonym pairs.

2.3   Part-whole processing

A third aspect of environmental embodied cognition, which has been shown to play a key role in metonymy creation, is part-whole processing. In life, we rarely see the whole of an object in a single viewing: we usually only see it from a particular angle, and have to use our world knowledge to make assumptions about what the rest of the object will look like. As humans, we are very good at doing this. Gestalt psychologists have used a number of studies, both linguistic and non-linguistic to show that when pieces of information are missing from a pattern, people will complete the pattern for themselves, sometimes not even noticing that there are pieces missing. People only need to see parts of a shape such as a square or circle to recognize the whole shape intended. In a study designed to demonstrate the power of part-whole processing, Cutting and colleagues (1978) found that when people are taken into a dark room and asked to observe the movements of someone dressed in black, but with lights attached to various points of their body, they can tell what the person is doing, their gender and (if they know them), who the person is, simply by watching the movements of the lights. This finding reflects the strength of the PART-WHOLE schema in humans. We are able to perceive a whole object, scene or event, when we have only been shown parts, and we are able to use the whole object, scene or event to infer the

presence of parts that were not even there. This skill is necessary for us to understand and interact with our environment, as it is virtually impossible to view all aspects of an object, scene or event at the same time. These connections underlie two of the most basic metonymic relationships: the PART FOR WHOLE relationship and the WHOLE FOR PART relationship. These two relationships have been found to account for a substantial amount of the metonyms discussed in the literature (Radden & Kövecses 1999) and, according to some accounts, are thought to explain all cases of metonymy (Ruiz de Mendoza Ibáñez & Diez Velasco 2002). There is clearly a strong relationship between the ability to complete patterns (*gestalts*) and the ability to relate the functional parts of a complex entity to the entity itself, as both of these involve the ability to perceive and process part-whole relationships.

I would like to end this section with an example of metonymy that displays the three aspects of environmental embodied cognition discussed thus far. In British Sign Language (BSL), the sign for 'computer' involves both hands being held next to each other in front of the body with palms facing down, with fingers wriggling up and down. This sign evokes the act of typing, which is perceptually the most salient act associated with a computer, and foregrounds what a human actually does with a computer, thus drawing attention to one of its main human affordances. There is also PART FOR WHOLE processing involved as typing is only one of the many things that one might associate with working on a computer. Others might include turning on the computer, clicking on the mouse button or looking at the screen.

2.4.   Cognitive off-loading

An important consequence of the environmental nature of embodied cognition is that it facilitates the off-loading of cognition onto physical or environmental artefacts. A good example of the role played by cognitive off-loading in metonymy can be found in Deignan et al.'s (2013) study of the language and gesture employed by a lecturer in International Development. In this study, the lecturer was explaining management models to two interlocutors, one of whom was a colleague (and therefore a member of the same professional discourse community), the other one was not. One of the models that she was explaining to the interlocutors was the 'Competing Values Framework'. This model is used to describe different types of organizations in terms of how centralized or decentralized they are, and how inward or outward-focused they are. The lecturer illustrated this framework by means of a diagram which she drew on a flip chart before the arrival of the interlocutors. In this diagram, she drew the two variables sitting along two intersecting axes. Each of the four resulting quadrants represented a particular type of organization, namely: 'bureaucracy', 'human relations', 'open systems' and 'goal-oriented'. Organizations that were 'open' and 'outward-looking' sat towards the top and the right of the diagram, whereas centralized and inward-looking organizations sat towards the bottom left.

In both the exchanges, the lecturer described the framework by referring specifically to previous bosses in her department, with each boss metonymically representing one of the four styles of management. In both exchanges, the lecturer metonymically 'off-loaded' the management styles onto the diagram that she had drawn on the flip chart. She used the diagram metonymically to locate the bosses according to their management styles, pointing to various parts of the diagram and explaining to her interlocutor that the various heads of department were 'definitely over here', 'over to this side', 'probably towards the left', or that 'we made loads of money when that boss was in charge'.

3.   Metonymy and the social nature of embodied cognition

Social embodied cognition, which involves the distribution of embodied cognitive processes across the members of a social group, is an important concept, as bodily experiences are interpreted very differently according to the socio-cultural meaning resources that are available to us (El Refaie 2014). These meaning resources provide the framework within which embodied experience is interpreted.

There are a number of socially sanctioned ways of interpreting embodied metonymy, which affect what we do with our own bodies. One important factor is gender. In all languages, there are strong social conventions concerning what males and females are *supposed* to do with their bodies, and what these actions 'mean'. In her study of the role played by body language in Dickens' novels, Mahlberg (2013: pp112-113) shows how the term 'standing with his back to the fire' is often used to portray male characters in powerful positions. As Mahlberg points out, the fact that the fireplace is a prominent part of the room means that standing with one's back to it puts these men in a prominent and powerful position. They are also, rather selfishly, absorbing all the warmth from the fire. Women, in contrast, are almost never portrayed as standing with their backs to the fire, but they are occasionally portrayed as *sitting* with their backs to the fire. There is only one instance in Dickens of a woman standing with her back to the fire, and this is Mrs. Pipchin, in the novel *Dombey and Son,* who runs a strict children's boarding house, which she rules with a rod of iron. She is a widow and a 'marvellous, ill-favoured, ill-conditioned old lady':

(4)   [...] and Mrs Pipchin, *with her back to the fire*, stood, reviewing the newcomers, like an old

soldier. ('Dombey and Son', in *The Works of Charles Dickens,* Vol. III, New York: D. Appleton

and Company, 1868, p. 44.)

Mahlberg points out that by presenting Mrs Pipchin in a male pose, Dickens is emphasizing

the fact that she is in charge, without a man in her life. These examples demonstrate the

important role played by social embodied cognition in metonymy. Having one's 'back to the

fire' works as an embodied metonym for certain types of behavior and characteristics, but

the precise meanings that are intended differ considerably according to gender, and

according to whether the person is standing or sitting, and whether these meanings are

socially sanctioned.

In another example, Mahlberg (ibid.: p.102) compares occurrences of the act of

'putting a hand on one's shoulder' in the novel *Nicholas Nickleby*. When this action is carried

out by male characters, it serves as metonymic shorthand for friendship, emphasis or

control. In the one case where this act is carried out by a female character, it is used in the

literal sense and the character (Mrs Snevellicci) is holding onto someone for physical support

(ex 5). Again, there is evidence of embodied cognition in both cases, but the precise

metonymic meanings that apply to each gender are determined by social conventions.

(5)   She actually *laid her hand upon the shoulder* of the manageress (Charles Dickens, *The Life

and Adventures of Nicholas Nickleby,* Chapman and Hall, 1839, p. 288.)

Another place where we can see the impact of socially-constructed body roles on

metonymic thinking is in the area of 'enclothed cognition', the idea that one's body schema

can be extended to the clothes that one wears.[4] For example, Adam and Galinsky (2012)

conducted a study in which they had participants complete an experimental task wearing a white lab coat. Half of the participants were told that it was a doctor's coat and half were told that it was a painter's coat. There are metonymic connections here between the coats and the types of people who wear them. The participants who were told that they were wearing a doctor's coat performed the task with considerably more attentiveness than those who were told that they were wearing a painter's coat. In a previous study these researchers had found that participants who had been asked to wear a lab coat outperformed those who were not asked to wear a lab coat. Their findings suggest that the behavior of the participants was affected by the symbolic meaning of the coat, as well as by the physical experience of wearing it.

Social embodied cognition also operates in metonymic entailments of conceptual metaphors. We can see an example of this in Musolff's (2013) comparison of the way in which the 'body politic' metaphor is exploited in English and Chinese. He found that English speakers conceptualize the political system as a body, following a hierarchical approach. In contrast to this, the Chinese also have the political system as a body, but the different cities are viewed as different parts of the body through a process of metonymic extension. For example, he found that Chinese participants in his study referred to Guangzhou as 'the guts' ('where the peasants are perpetually bound to the soil') and the 'feet'; Tianjin as 'the hands' ('because there is manufacturing'); Shenzhen as 'the eyes', and Tibet as 'the stomach' ('because it makes Chinese people feel uncomfortable'). Thus we have metonymic links in the source domain of the metaphor (for more on this point, see Ruiz de Mendoza Ibáñez 2014, *this volume*), with the focus of the cities and their respective contributions to the Chinese economy being grafted onto the 'body politic' metaphor.

4.   Metonymy and the dynamic/developmental nature of embodied cognition

Embodied cognition is by no means stable, straightforward or permanently fixed in early childhood. It is more appropriately viewed as a highly complex, dynamic and developmental process, whose nature varies according to the specific situations in which we find ourselves, and the extent to which we are consciously aware of our bodies at any given moment. The nature of our embodied cognition is also likely to develop as we grow older. The dynamic/ developmental view of embodied cognition therefore encapsulates its characteristics as both a developmental and an adaptive process. In any study of the way embodied cognition impacts on the way we use metonymy, we need to consider how it changes over time and in accordance with changing circumstances.

We can see evidence of the developmental nature of embodied cognition in the comprehension of metonymy by young foreign language learners. Piquer Piriz (2005) explored how 5, 7, 9 and 11 year-old Spanish learners of English understood and reasoned about the meanings of figurative extensions of the words 'head', 'hand' and 'mouth. She found that the children's reasoning strategies varied significantly according to their ages. Her findings for the word 'head' are particularly interesting. She discovered that, in comparison with younger children (aged 5 and 7), who reasoned metaphorically, using a vertical schema, with the head at the top, the older children (aged 9 and 11) displayed a strong tendency to reason metonymically using the BODY PART FOR FUNCTION (i.e. HEAD FOR GIVING ORDERS) metonymic relationship. Whilst this metonymic reasoning was helpful in interpreting expressions that were congruent with that schema, expressions that were incongruent with the schema (for example 'head of the stairs') were more likely to be misunderstood by the

older children than by the younger children. This particular expression was understood correctly by 82% of the 7 year-olds, but only 58% the 11 year-olds. Piquer Piriz found that the deployment of preferred reasoning strategies gave rise to correct and incorrect responses at all ages. These findings show that children's domain knowledge develops as they experience more bodily and psychological interactions with the world, and these interactions make some metonymic relationships more accessible. However, although the children's domain knowledge becomes more elaborate as their knowledge of the world increases, the elaborate nature of this knowledge is not always advantageous. Piquer Piriz's finding complements findings from laboratory studies (e.g. Rundblad & Annaz 2010) in that it emphasizes the complex and developmental nature of metonymic reasoning.

I would like to close this section with an example that not only displays the dynamic nature of embodied cognition in relation to metonymy, but also reflects the other two characteristics of embodied cognition just discussed. In other words, the metonymic meaning in this example appears to be shaped by the environmental, social and dynamic features of embodied cognition. In British English, the words 'upstairs' and 'downstairs' can be used to refer respectively to 'bosses' and 'workers'. In the Bank of English (BofE) corpus, bosses are nearly always 'upstairs' and workers are nearly always 'downstairs' (ex 6, taken from Deignan et al. 2013: 179):

(6)   a.   … whizz kid managers '*upstairs'* don't take any notice of experienced people.

        b.   Tell them *downstairs* that I have specifically requested you.

        c.   If the *upstairs* don't get you the *downstairs* will.

We do not know whether in practice, managers are more likely than workers to be located upstairs rather than on the ground floor, although a simple Google search for the expression 'the boss upstairs' yields three times as many hits as 'the boss downstairs'; and the expression 'the manager upstairs' yields twice as many hits as 'the manager downstairs'. The fact that usage tends to reflect what is actually the case, suggests that there is a complex interaction between real social experience (including the role of the vertical axis in buildings), and the embodied metonymies drawing directly on it. In addition, a range of primary metaphors coherently map the UP/ DOWN image schema onto the social hierarchy (POWER IS UP, STATUS IS UP, CONTROL IS UP), presumably reinforcing the power of the metonyms (see also Matlock & Winter, *this volume*).

This interaction is likely to be motivated by the environmental, social and dynamic features of embodied cognition. The environmental contribution to this apparently 'embodied' metonymy accounts for the relationship between the location of the individuals and who they are. However, as we have just seen, the explanation does not get us very far, because it does not account for the fact that we are more likely to refer to the bosses as 'upstairs' even when in reality, they are just as likely to be located downstairs. In order to explain this pattern, we need to appeal to the social and dynamic features of embodied cognition.

The social contribution comes from the British Class system, and the idea of the manor house, where the rich owners lived upstairs (possibly for reasons of security) and their servants lived downstairs. This arrangement has arguably been reinforced in the national consciousness by the popularity of British television costume dramas, such as 'Upstairs Downstairs', and more recently, 'Downton Abbey', where, week after week, viewers are exposed to this spatial and class division.[5] Programs such as these may serve to 'distribute'

this particular metonymy amongst British speakers of English thus reinforcing our existing cultural schemas. Interestingly, these metonymic usages appear to be virtually non-existent in American English. A search of 200 corpus lines containing the term 'upstairs' in the Contemporary Corpus of American English (COCA) reveals no such uses of the term. A search of 200 corpus lines containing the term 'downstairs' reveals only one instance, and, somewhat ironically, this is a reference to the British costume dramas 'Downton Abbey' and 'Upstairs Downstairs':

(7)   The wealthy and upper-class folks of Downton Abbey and Upstairs Downstairs long ago outsourced their kitchen and scullery work to *downstairs* staff. (COCA: 2011 MAG)

The dynamic contribution comes from the time lag between a time in Britain, when people really did live like this, and nowadays, where, for the most part, they do not. Deignan (2003) has shown that there is often an indirect link between figurative expressions and the culture they represent.

In this section, we have seen how the environmental, social and dynamic features of embodied cognition shape its role in metonymy. The extent to which these different features are highlighted in metonymy is likely to depend on a number of factors, such as the context in which the metonym is used, one's reasons for using it, and the relationship between the individuals who are using it. In different contexts, one would expect to find considerable variation concerning the intensity and transparency of the role played by embodied cognition in the creation of metonymy. In some instances, the role will be clear, in others it will be harder to identify. In the following section, I explore some of these contextual factors.

5.   The influence of genre and register on the transparency of embodied metonymy

The range of ways in which language use varies according to context is encapsulated by the notions of 'genre and 'register'. Genre and register have a significant effect on the ways in which both metaphor and metonymy are used (Deignan et al. 2013). Deignan et al propose a framework for analysis, which allows for an accurate and complete description of the ways in which figurative language use is shaped by the genre and register in which it appears. They illustrate the effectiveness of this framework by applying it to a range of datasets that vary in terms of genre and register. In this section, I draw on examples from different datasets to show how the transparency of the role played by embodied cognition in metonymy is shaped by both genre and register. Although I do not conduct a detailed analysis of a single dataset, using Deignan et al's framework, I do make use of the essential elements of the framework. That is to say, I focus on the three defining characteristics of genre (communicative purpose, staging and discourse community) and the three defining characteristics of register (field, tenor and mode).

The three defining characteristics of a genre are its discourse community, its communicative purpose and the way in which ideas are staged (Swales 1990). The three identifying characteristics of a register are its 'field' (what is being talked about), its 'tenor' (the relationship between the interlocutors) and its 'mode' (whether it is written, spoken, visual or gestural, and whether the language is ancillary or constitutive) (Halliday, 1985). Although to date no studies have directly investigated the ways in which genre and register affect the transparency of the role played by embodied cognition in metonymy, a number of

findings do point towards some possible patterns. In this section, I examine these findings and propose some tentative hypotheses concerning the ways in which the salience of embodied cognition within metonymy might be affected by genre and register.

5.1   Genre

Communicative purpose

Beginning with genre, an example of the way in which the embodied nature of metonymy appears to vary according to communicative purpose can be found in Hodder and Houghton's (2014) study, in which they compared the language used on Twitter by the British University and College Union (UCU) during strike periods with the language used during non-strike periods. During non-strike periods, the main communicative purposes of UCU Tweets are to create and develop a feeling of community, to relay news of what is happening in different universities across the UK, and to maintain and increase membership of the union. During strike periods, the Tweets serve more as a 'call to action', in which members are exhorted to join the strike. Using corpus linguistic techniques, Hodder and Houghton found that during strike periods, there was a significant increase in the number of words that related to the human body, including action words. The majority of the words in this category were used metonymically and appeared to involve explicit references to the body, in such a way as to imply that embodied cognition is involved (ex 8).

(8)   a.   Want to know *just how much money our universities are sitting on*?

       b.   Another *big shout out* to all our pickets this morning

c. To those Vice Chancellors who say they'd like to pay their employees more, *you know where the phone is.*

The use of metonymy in all of these tweets adheres to Radden and Kövecses' (1999) 'human over non-human' principle of vehicle selection, which is inspired by Langacker's (1991; 306-7) 'empathy hierarchy', which places humans above physical objects in terms of their potential to attract empathy, and by extension attention. The first tweet personifies the universities, allowing them to be construed as living organisms that can physically 'sit on' money, and thus involves a metaphtonymy (see Ruiz de Mendoza Ibáñez 2014, *this volume*). The second contains a cause for effect metonymy in which the word 'shout' is used to indicate a desire for a large number of people to hear and respond to the message being conveyed, and the third refers a hypothetical 'phone' via an OBJECT FOR ACTION metonym; it is highly unlikely that a Vice Chancellor would, in person get on the phone to the UCU. These metonyms are all emotive to some extent. What we have here is a possible indication that embodied metonymy is likely to be more prevalent in instances where there is high emotional intensity. The 'physicality' in the text reflects this intensity of feeling. There are also elements of personification in these texts, which also underscore the embodied nature of metonymy.

One possible explanation for the sudden increase in the salience of embodiment in these metonyms relates to the physical relationship between metonymy and motion itself. When our bodies are actually moving, or when we are witnessing or talking about movement, the language that we use reflects that movement (El Refaie 2014). Evidence for this contention can be found in the large amount of embodied metonymy that exists in football commentary (Levin 2008). Deignan et al. (2013: 191-229) also analyzed figurative

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language use in texts produced by a group of people associated with a children's football club, comparing the language used by supporters standing on the touchline at the matches with that used in the online post-match reports. They were thus comparing two related genres with slightly different communicative purposes. They found that twice as much metonymy was used by the supporters (although the figures were low in both corpora). Much of this metonymy appears to have involved embodied cognition in the broad sense discussed in Section 1. For example, they found that in the supporters' discourse the players were frequently defined metonymically by their position on the pitch, as in the following example (ex 9, cf. ibid. 211):[6]

(9)   Matthew, you're centre midfield

Here the centre of the pitch is used metonymically (via a PLACE FOR PERSON relationship) to stand for the player who is supposed to be based there.

They also found that the word *ball* was often used metonymically (via an OBJECT FOR ACTION relationship) to refer to an especially good piece of play, or to a missed opportunity for good play (ex 10, cf. ibid.: 214). There were also some hyperbolic uses of metonymy (ex 11, cf. ibid.):

(10)   Boys that was a great ball, and we're not attacking it
(11)   Patrick, Patrick, Patrick, stand on it

In ex 11, the boys are being exhorted to get near the ball, rather than actually 'on' it. Here an extreme action metonymically represents a related, less extreme action. The exaggerated

feel of the utterances reflects the urgency of the situation, and makes the embodied feel of the utterances even more salient. The increased salience of the embodied cognition underlying these metonyms is likely to be related both to the overall communicative purpose of the genre (to exhort the children to play well) and to the fact that it involves a need for immediate action.

Stage

Evidence for the effect of the stage of the genre on the transparency of embodied cognition within metonymy can be found in Deignan et al's (2013: 128-164) study of an academic exchange, discussed in Section 2. They found that in both of the exchanges, dense clusters of metonymy were found towards the end of the exchange, and in both cases, these clusters served a summing-up function, drawing together themes that had been covered in the earlier part of the discussion. Similar findings have been made for metaphor by researchers looking at academic lectures (Corts & Pollio 1999; Low et al. 2008), reconciliation talk (Cameron 2007) and religious sermons (Corts & Meyers 2002). These researchers identified dense clusters containing both metaphor and metonymy, which were found at the end of the lecture or sermon, and whose purpose was to combine the various threads that have been proposed during the lecture or homily into a kind of summing up paragraph. These clusters were often accompanied by increased levels of gesture use (Corts & Meyers 2002; Corts & Pollio 1999).

These findings are also partially mirrored by findings in English Literature. Toolan (2015) observes that, at the end of a short story or novel, we often find a powerful passage, in which the key ideas are summed up, with references back to earlier themes. When commenting on the typical characteristics of these passages, he observes that, among other

things, they include a high density of lexical and structural repetition and para-repetition, picking up on themes that have occurred previously in the novel, strong internal rhythms, a slight confusion caused by a loss of grammaticality, words and feelings of strong intensity and single sentences that combine an externally reported event with a report of the protagonists' state of mind. Most importantly, Toolan reports such passages have a high emotional intensity. Example (12) provides one of the passages used by Toolan to illustrate his point:

(12)   She'd thought it was touch. *Mouths, tongues, skin, bodies*, banging *bone* on *bone*. Inflammation. Passion. But that wasn't what had been meant for them at all. That was child's play, compared to how she knew him, how far she'd seen into him, now. ("Passion", Alice Munro, *Runaway*, London: Vintage Books 2006)

The first sentence in this passage contains a number of metonyms whose embodied nature is highly transparent. This is also true of some of the other passages he discusses. The italicised body part metonyms work together to build a vivid scene; a scene that has been at the back of the protagonist's mind throughout the second half of the story. The scene is then negated in the following sentence. The salience of embodied cognition within these metonyms provides extra force to this already powerful summing-up passage.

Discourse-community membership

In order to focus on discourse-community membership, we need to return to Deignan et al's (2013: 128-164) study of academic conversations. Amongst other things, they observed that whereas the colleague picked up on the metonyms and used them to extend the discussion

of different management styles, the outsider failed to do so. The shared use of metonymy here appears both to have resulted from, and perhaps helped to develop a sense of shared understanding between the lecturer and her colleague. Similarly, in their football study, they found that many of the embodied uses of metonymy had meanings that were specific to that particular discourse community, and that were different from mainstream meanings.

5.2   Register

Register can also affect the transparency of the role played by embodied cognition in metonymy. Deignan et al (ibid.: 191-229), in their football study found higher levels of metonymy in the supporters' discourse than in the match reports, which they attributed to the fact that the language in the former was spoken and ancillary, and that there was a need for rapid communication. These factors may also have contributed to the embodied feel of the metonyms used in this context. The increased salience of embodiment may also have resulted from the fact that the *tenor* was more informal and the *mode* was more ancillary; there was also a high level of immediacy to this situation, the metonymy being in and of the moment. Moreover, the relationship between the parents (mostly fathers) on the touchline to the children was more familiar, less formal, and less hierarchical than the relationship between the manager and the players. The *field* of the discourse may also have increased the salience of embodied cognition within the metonyms used: the focus is very much on the action, and action is, by necessity, embodied. Finally, as with the UCU Tweets mentioned above, there is a high level of emotional intensity in these 'calls to action'; many of the fathers are highly competitive; they want to see their sons win the match, levels of 'personal involvement' are high.

Mode

Of all the genre and register features likely to affect the degree to which embodied cognition is salient in metonymy, the strongest is probably mode. The embodied nature of metonymy is much more visible in modes of expression that involve the body, such as gesture (Mittelberg & Waugh 2009), sign language (Taub 2004) and dance (Gibbs 2014) than it is in spoken or written language, simply because these forms of communication involve the body itself. A good example of the transparency of embodied cognition in metonymy in gesture can be found in the data used by Deignan et al. (2013) in their aforementioned study of academic communication. Although they do not report it in their chapter, there is an interesting episode in which the lecturer imitates the act of writing really small letters in order to illustrate the activity of 'doing paper trails'. Here, the most salient, physical action metonymically represents the complex process with which it is associated.

Müller (*this volume*) demonstrates how the use of gesture can foreground, and thus intensify the 'metaphoricity' of an expression or an entire passage by emphasizing the embodied nature of the metaphor. Here we see a similar phenomenon with respect to metonymy. Moreover, within these modes of expression, when a communicator becomes more passionate about the topic, the metonymic gestures, signs and dance movements become bigger and more elaborate, thus making the role played by embodied cognition in the creation of metonymy even more transparent.

In this section, I have proposed a number of hypotheses concerning ways in which genre and register features may affect the transparency of the role played by embodied cognition in the creation of metonymy. In addition to genre and register features, the amount of *movement* (or *motion*), and by extension the amount of *emotion* that is involved,

are both likely to affect the transparency of the role played by embodied cognition in the creation of the metonyms that are being employed.

6.   Conclusion

I have looked at a number of ways in which metonymy is likely to be motivated by embodied cognition. I have shown how a broader, extended notion of embodied cognition allows us to focus on its environmental, social, dynamic and developmental features, and to explore the ways in which these features manifest themselves, in different ways, in metonymy. I have also suggested a number of ways in which the involvement of motion, and the intensity of emotion may increase the transparency of the role played by embodied cognition in the creation of metonymy. Finally, I have shown how this relationship is mediated by genre and register. More research in this field should be conducted in order to shed further light on the fundamental question of how and why we think and communicate using metonymy.

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Notes

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[2] Joe and Oscar Malt, personal communication.

[3] Thank you to Francisco Ruiz de Mendoza for this observation.

[4] Cuccio (this volume) provides an extended discussion of the notions of 'body schema' and 'body image'.

[5] Fiona MacArthur, personal communication.

[6] In these examples, which are taken from Deignan et al. (2013), solid underlining denotes metaphor and dotted underlining denotes metonymy.