

Language and Communication: evidence from studying children

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Introduction

At birth, human individuals do not speak any language but the developmental process leading to full linguistic mastery is rapid leading some scholars to say that we ordinarily have a full mastery of language (barring vocabulary limitations) by the age of four or five (Pinker, 1994). The development of language is one of the most important cognitive developments that humans undergo and that raises the question of how it takes place. For example, is learning central to the process or are there bodies of language specific innate knowledge that obviate the need for learning? One particular aspect of this question will be the ultimate focus of this chapter: how do children come to grasp the meanings of the words that belong to their vocabularies?

Knowledge of Language

One natural way of viewing linguistic mastery is to see it as being based on knowledge of language (Chomsky, 1986). For example, I am able to communicate by means of English sentences because I possess the relevant knowledge of English and this includes, semantic, syntactic, morphological, phonological and pragmatic knowledge. How do children develop such linguistic knowledge? Recent decades have seen an explosion in the empirical study of language development (see Ambridge and Lieven (2011) for helpful comprehensive survey). A key aspect of the debate has concerned the question of whether language is something that is learned by means of domain general learning mechanisms or whether it has a substantial innate basis that is specific to language.

The concept of innateness looms large in debates about language acquisition and this raises the question of what it is for something to be innate. Unfortunately, the traditional characterisation of innateness in terms of presence at birth is problematic for two reasons. First, there are characteristics that are innate that are not present at birth but emerge in the course of development such as secondary sexual characteristics like pubic hair and breasts. Second, the notion of in utero learning is hardly incoherent. In fact, there is evidence that the developing foetus is sensitive to language spoken by its mother and learns on the basis of this. For example, in an experiment conducted by De Casper and Spence (1986) pregnant women repeatedly read aloud a particular story. After birth the children of these women were played recordings of their mother reading that very story. They were also played recordings of their mother reading new stories of a similar length and intonation pattern. The children displayed a clear preference for the story that their mother had read whilst pregnant suggesting that they had a familiarity with it gained from before they were born. This preference was indicated by their sucking whilst breastfeeding more enthusiastically when listening to the story that their mother had read whilst pregnant.

In the light of this how should we characterise innateness? As a rough and ready characterisation, for something to be innate is for it *not* to be learned and for it to be a feature of the organism at the beginning of its existence or for it to emerge reliably from that initial state in the normal course of development.

Syntax

By far and away the most prominent debate in the recent study of language development relates to the development of syntactic knowledge, knowledge of how to put together words to build more complex structures such as phrases and sentences. And by far and away the most prominent contribution to that debate is constituted by the work of Noam Chomsky who since

the late 1950s has been developing and defending a theory according to which our knowledge of syntax has a substantial innate basis. (See Chomsky (2016) for a recent accessible statement of his perspective.)

For Chomsky the mind-brain is made up of a number of functionally distinct yet interacting components that are akin to the internal organs of the body. These components are part of our biological endowment and they develop in a manner that is constrained and directed by our shared genetic makeup. One such component is the language faculty, a mental system that underlies language development and use. The initial state of the language faculty, its state before being subject to any linguistic input, encodes Universal Grammar (UG for short). UG is a system of syntactic rules or principles common to all human languages. It constitutes a template for language and constrains the form that any human language can take. That is not to say that all human languages are syntactically indistinguishable and as a consequence children do not have an innate knowledge of any particular spoken language. However, a child's language specific knowledge at birth is such that she only requires quite limited information to acquire a full knowledge of the local language she ends up speaking, a knowledge that is encoded in the mature state of her language faculty.

Chomsky's primary argument for this nativist perspective is the poverty of the stimulus argument. According to this argument, children typically acquire a complete knowledge of the syntax of their first language by the age of four or five. However, the experiences they have of language in the first few years of their lives are far too impoverished to have facilitated learning from scratch so they must have had language specific innate knowledge to aid the developmental process. Their linguistic experiences are impoverished in several respects. First, the language that they hear contains many grammatical errors (Chomsky, 1972). Second, many of the sentences that a child would need to hear to learn the syntactic rules of her language, particularly complex sentences, are rarely encountered. Third, children don't generally receive

negative data, that is explicit information that the ungrammatical sentences that they produce are ungrammatical (Pinker, 1989).

Chomsky's views have dominated linguistics and cognitive science for several decades but recent years have seen something of a backlash. Probably the most prominent contemporary alternative to Chomsky's linguistic nativism is constituted by an approach known as the usage-based theory the key champion of which is Michael Tomasello. For Tomasello (2003; 2008) language is a system of communication that is both used and learned in a social context; for him there is no such thing as the language faculty or UG.

Tomasello is committed to an approach in linguistics known as construction grammar. A construction is "symbolic unit with meaning" (Tomasello, 2003: 160). Hence any concrete word or sentence such as 'aardvark' or 'the aardvark ate a termite' is a construction. But as concrete sentences exemplify more abstract forms the following are also constructions:

- X ate a termite
- X ate Y
- TRANSITIVE-SUBJECT TRANSITIVE VERBed TRANSITIVE-OBJECT

For Tomasello, a language is an inventory of constructions that is learned in a gradual and piecemeal manner beginning with concrete words and sentences and moving on to increasingly abstract constructions. Constructions, even the most abstract ones, differ from the rules and principles that lie at the heart of Chomsky's vision in that they are inherently meaningful; for example, "the pattern *X VERBed Y the Z* is a construction of English that signifies some transfer of possession (either literal or metaphorical)" (Tomasello 2003: 99). Thus, Tomasello's approach doesn't involve drawing a firm distinction between syntax and semantics and, accordingly, accounts for semantic development just as much as syntactic development.

For Tomasello the language learning process begins at about age one when the child has developed certain key perceptual and cognitive capacities. The first of these involves the possession of basic concepts and the ability to represent a viewed scene in terms of those concepts. This capacity would be utilised when, for example, seeing a person throw a ball to someone else, a child conceptualises the scene as having three participants (two people and a ball) and involving one of the people acting on the ball so as to transfer its possession to the other. The second capacity is that of recognising patterns exemplified in items of data that differ at the concrete level. The third capacity is that of having sophisticated mind-reading skills. This capacity involves being able to discern the higher-order mental states of other people, where a higher-order mental state is a mental state the having of which involves attributing a mental state to someone (as when you believe that I believe that aardvarks eat termites and when I believe that you believe that I believe that aardvarks eat termites). Higher-order mental states are central to the phenomenon of joint attention when two people are not only attending to the same thing but are mutually aware that they share that attention.

The key thing about these capacities is that though they are not specifically linguistic they can be brought together so as to facilitate the learning of language in the following manner. From infancy children participate in routinized activities with their carers such as being fed, being dressed, playing, and so. In this context the child and carer will often jointly attend to an element of the viewed scene and employ language. For example, suppose a child in the early stages of language learning and an adult are playing with a ball and the adult hides the ball behind her back and says “ball gone.” The fact that the pair have been jointly attending to the ball whilst playing a familiar game and that they mutually know that the ball has disappeared from view enables the child to work out that the adult intends to say that the ball has disappeared. Now suppose a cat that has been sleeping in the corner of the room noisily stirs and slinks out of the room. The adult looks at the cat, turns to the child and then returns to

watching the cat thereby establishing joint attention of the cat with the child. The adult then says “cat gone.” Given the evidence, the child can easily work out that this phrase means that the cat has disappeared.

At this stage the child knows the meaning of two distinct sentences but doesn't appreciate the connections between them. This changes when she applies her pattern recognition skills to the sentences. For, she recognises that both sentences talk about something disappearing and contain the component “gone.” This enables her to work out that “gone” relates to disappearance and in a similar manner she can work out the meaning of “cat” and “ball.” Moreover, by reflecting on the similarities between distinct sentences she can recognise that distinct sentences can exemplify a common pattern. For example, both “ball gone” and “cat gone” have the form “X gone.” Realising this, the child stores the construction “X gone” representing it as meaning that X, whatever it is, has disappeared. This construction can then be used in building and understanding sentences that the child has not encountered once she has learned the meaning of further words such as “dog”, “man” and the like. In this manner the child can gradually add more constructions to her store of linguistic knowledge moving towards increasingly abstract constructions. What is noteworthy about this process is that learning the meaning of words and that of larger abstract structures goes hand in hand and is mutually supportive.

Vocabulary development

Chomsky's nativism relates to syntax and at first appearances it might seem that there is no mileage in extending a nativist perspective to vocabulary development for several reasons. First, suppose that we adopt the standard view that a word is a pairing of a sound and a meaning so that when a person has a particular word in their vocabulary they know that the relevant sound-meaning pairing holds in their linguistic community. Clearly, languages vary widely in

how they pair sounds and meanings and that is why it is difficult to understand speakers of another language even when the thoughts they express by means of their words are very familiar. It seems uncontroversial that such sound-meaning pairings are matters of convention that need to be learned if they are to be known. Second, vocabulary development is a much longer process than syntactic development and cannot plausibly be characterised as complete by age five; indeed we add to our vocabularies throughout our lives. This seems to leave plenty of time for learning thereby suggesting that poverty of the stimulus considerations are not at work. Third, although adult speakers of any given language will have vocabularies that overlap there will also be a lot of divergence reflecting differences in experience.

Nevertheless, I think that there is something important that is innate with respect to vocabulary development and this has to do with the meaning side of the sound-meaning pairing. To appreciate this it is necessary to take a step back and reflect on the question of what meanings are and on the challenge that children face when working out the meaning of a newly encountered word.

Concepts are the ingredients of thoughts. For example, one cannot entertain the thought that all aardvarks eat termites unless one has the concepts ALL, AARDVARK, EAT and TERMITE. As thoughts exist in the mind then so do concepts. Concepts correspond to categories, be they categories of thing, event, state, process, or whatever. A concept is at least partly individuated in terms of the particular category that it corresponds to and it serves to pick out or represent that category. Accordingly, the content of a concept is at least partly a matter of which category it represents. Hence, for example, the concept AARDVARK has the content *aardvark* because it picks out or represents the category of aardvarks.

There is a close relationship between language and thought: we use sentences to communicate our thoughts and come to appreciate what others think on the basis of understanding the sentences that they produce. For this to be the case there needs to be a close

relationship between the contents of our thoughts and the meaning of the sentences that we use to express them.

Thought is compositional in that the content of a thought is determined by the content of its component concepts and the way that they are put together. Similarly, linguistic meaning is compositional in that the meaning of a sentence is determined by the meaning of its component words and how they are put together. The implication of this is that the meaning of the words we use in communicating our thoughts must align with the contents of the concepts that make up those thoughts. From this insight it is a small step to the conclusion that word meanings are concepts in the respect that the meaning of a word for an individual (or a linguistic community) is a matter of the identity of the concept the individual (or members of the community) associates with the sound half of the sound-meaning pairing that constitutes the word. So, for example, “aardvark” means *aardvark* for me (or my linguistic community) because I (or most members of my linguistic community) associate the sound I vocalise when I say ‘aardvark’ with the concept AARDVARK.

Associating a sound with a concept is itself a mental state. This mental state of associating a particular sound with a particular concept involves employing a mental representation of the sound in question and the mental representation that constitutes the concept in question. Linguists sometimes label this in-head store of an individual’s knowledge of the words of her language, how they sound and what they mean, a mental lexicon (Aitchison, 2012). Thus, vocabulary development involves adding items to the mental lexicon.

Many researchers of language development refer to a thought experiment developed by the philosopher W.V. Quine (1960) to show that children face a substantial challenge in learning new words (Bloom 2000). Quine imagined a linguist attempting to translate the language of an isolated tribe. He witnesses a member of the tribe utter “gavagai” whilst pointing at a rabbit. How should “gavagai” be translated? Quine points out that there are many competing

hypotheses that are equally consistent with the evidence. For example, for all the linguist can tell, “gavagai” could mean *rabbit*, *undetached part of a rabbit*, *time slice of a rabbit*, *rabbit flea*, or any one of infinitely many other possibilities. Quine ultimately draws the conclusion that words don’t have determinate meanings but that is not the moral that psychologists and linguists have tended to draw from his reflections. Rather, they have assumed that children do succeed in learning words and so somehow overcome the challenge that Quine so vividly describes.

This raises the question of how children manage to overcome Quine’s challenge as the empirical evidence suggests that they do so from an early age. For a long time a child’s comprehension of the words of her language lags behind production (Griffiths, 1986) but even if we focus on production it is evident that vocabulary development proceeds at a heady rate. Most children produce their first word at about one year of age and by the time they are two they typically have a productive vocabulary of between 200 and 300 words. This vocabulary is dominated by nouns that pick out categories of objects (such as “dog”, “milk” and so on) but it also includes verbs, adjectives, and other types of words (Bloom et al, 1993). From this age children acquire on average 3.6 words per day giving rise to a vocabulary of over 2000 words at four years of age. Some researchers have claimed that at this age children are capable of fast mapping, that is learning a word on the basis of a single exposure to that word (Carey, 1978).

In explaining how children overcome Quine’s challenge, some researchers have attributed to them biases that lead to them ruling out certain hypotheses that are in principle consistent with the data. These biases are often conceived as being innate but only operative in the early stages of language development. For example, Woodward and Markman (1998) postulate a whole object bias whereby children assume that nouns refer to whole objects rather than parts. Operating with this assumption would enable a child in Quine’s situation to discount *undetached rabbit part* as a possible meaning for “gavagai.”

Even if children have biases to help them narrow down the possible meanings of new words they encounter, they still need appropriate concepts in order to represent any possibilities they consider. This is clear from Tomasello's account of language learning; the child attempting to learn what 'ball' or 'ball gone' means in the manner he describes must have a prior grasp of concepts that enable her to represent the communicative intentions of the adult producing those words. In the case of that example, those concepts would be BALL and DISSAPEAR. That raises the question of how those concepts are acquired: are they learned or are they innate? Suppose that we have to learn what the words of our language mean (what sound-meaning pairings hold in our linguistic community). It is still consistent with this that the concepts that we combine with sounds in building our vocabularies are innate. I'm not seriously suggesting that all of the concepts for which we have words are innate; no doubt we learn plenty of them. However, what I will argue is that there is a stock of abstract concepts needed to make language learning possible that belong to our innate endowment.

Abstract concepts

The term "abstract" is ambiguous. In one respect, an abstract concept is one that is general rather than just referring to a particular; for example, the concept AARDVARK is abstract in that it applies to many distinct particular things (Gauker 2011; and Laurence and Margolis 2012). There is a question about how we acquire concepts that are abstract in this sense as our experiences are always of particulars; I experience particular aardvarks rather than aardvarkness in general. In the second respect, an abstract concept is one that refers to something that cannot directly be perceived, something that doesn't have a characteristic look, sound, taste, smell or feel. Arguably, the concept CAUSE is abstract in this sense. We might perceive a particular scene involving distinct objects, states or events and conceptualise them as being causally related. For example, I might perceive a striking of a match followed by a

lighting of that match and take the former to be the cause of the latter. But I don't perceive any causation; rather I apply the concept of causation in interpreting the nature of the relationship between the events I do perceive.

My concern is with concepts that are abstract in this second sense. We have many abstract concepts and words in our vocabularies that have such concepts as their meaning. As well as the concept CAUSE concepts of mental states such as those of BELIEF, DESIRE and INTENTION are abstract. For, not only can we not directly perceive the mental states of another person but many of our own mental states are unconscious. Even when we do introspect one of our own mental states we do so indirectly via an awareness of their internal effects such as their in-head vocalisation (Jakendoff, 2002, 2012). Another important abstract concept is that of an object in general, that is, the concept of something that continues to exist when it is not being perceived. Moral concepts such as RIGHT, WRONG, FAIR, UNJUST, and so on, are also abstract.

How do we acquire abstract concepts? Within the empiricist tradition such concepts are generally portrayed as appearing relatively late in development with the implication that an infant's conceptual scheme is very different from that of a typical adult being much less intellectually sophisticated. For example, Jean Piaget (1952; 1954), the founding father of developmental psychology, portrayed a child's development as passing through several distinct stages of increasing sophistication that begins from a very meagre base such that a child in her early years would not even possess the concept of an object or be capable of logical thought.

In recent years much work in developmental psychology has served to undermine Piaget's views by suggesting that infants have a sophisticated perspective on reality as part of their innate endowment. For example, Elizabeth Spelke (1994), Susan Gelman (2003) and Susan Carey (2009) have argued that infants carve the world into distinct domains and utilise different abstract concepts and knowledge involving those concepts to deal with each of those domains.

These domains include those of inanimate physical objects, minded agents, and biological entities. For example, Elizabeth Spelke (1994) argues that we have a core system of concepts and knowledge for dealing specifically with inanimate physical objects. Such concepts and knowledge are in place before a child has had any chance to learn it on the basis of her experiences suggesting that it is innate. A classic experiment supporting this kind of view was conducted by Karen Wynn (1992). Wynn's experiment on five-month old infants involved a stage, two puppets and a screen. At first one puppet was placed on the stage in full view of the infants. Then a screen was lowered to hide the puppet from view and a second puppet was placed behind the screen, with the infants seeing this manoeuvre. Then the screen was lowered sometimes revealing one puppet and sometimes revealing two with each participating infant seeing both of these scenarios. Wynn employed measures of looking time to determine which of these scenarios most surprised or violated the expectations of the infants (the assumption being that if an infant looked longer at one of the scenarios than the other then that indicated that she was more surprised by it). What Wynn found was that the infants were more surprised when only one puppet was revealed rather than two. From this she concluded that the infants had an innate concept of an object as something that continues to exist over time when not being perceived and innate knowledge that the world is populated by such objects.

In addition to inanimate physical objects, children have to deal with other people who are minded and act on the basis of their mental states. To do this they need a theory a mind that is made up of a body of concepts for mental states and knowledge about how mental states causally relate to one another, to external stimulation and to behaviour (Bloom, 2004; Epley, 2014). There is considerable evidence that infants draw a distinction between people and inanimate physical objects very early in life and have different expectations concerning how they behave. For example, infants express surprise when an inanimate physical object moves without something external making contact with it but become disconcerted when a face that

was mobile suddenly becomes still (Tronick et al, 1978). Such data leads many psychologists to attribute to us an innate theory of mind (Spelke 2003; Baillargeon et al 2010).

Even with respect to putatively concrete concepts such as DOG and WATER, there is evidence that children take an abstract perspective on them. In particular, children are essentialists with respect to many of the categories for which they have concepts. That is, they regard the items that belong to such categories as being bound together in virtue of having a hidden essence, a collection of properties that makes them what they are and is causally responsible for their perceivable features (Keil 1989). Susan Gelman (2003) argues that children adopt this essentialist viewpoint before they begin school suggesting that it is part of an innate perspective on reality.

Moral concepts are also abstract and research suggests that infants morally evaluate behaviour before the age of one. For example, Hamlin et al (2007) showed infants a little under one year of age a puppet show in which a duck tries to open a toy box with a heavy lid. Two bears then appear one of which attempts to help the duck open the box whereas the other attempts to hinder the duck. After the show the infants were given the opportunity to play with the bears and almost all of them chose to play with the kind bear suggesting that they had morally evaluated the behaviour of the bears and preferred one to the other on that basis.

In short, there is considerable evidence that children have a body of innate abstract concepts and knowledge involving those concepts and that this is part and parcel of a metaphysical picture that carves the external world into different domains that work in different ways.

How do such abstract concepts relate to vocabulary development? Many of these concepts do get lexicalised and the words corresponding to them enter the vocabularies of most speakers in the form of a relevant sound-meaning pairing. Now there is a respect in which that sound-meaning pairing will have to be learned. For example, I had to learn how the concepts of

CAUSATION and BELIEF are conventionally expressed in English. But in order to learn this I didn't have to learn the concepts CAUSATION and BELIEF.

If the abstract concepts that I have highlighted are innate then there is another implication with respect to vocabulary development that can be brought out by returning to Tomasello's theory of language learning. Tomasello portrays language learning from the beginning as drawing upon the child's ability to mind-read and to conceive of the viewed scene in a manner that lines up with that of the adults with whom she is interacting. This requires having a metaphysical picture akin to that attributed to children by the developmental psychologists discussed above. In particular, it requires drawing a distinction between inanimate physical objects and minded individuals and conceiving of both of these in terms of abstract concepts such as that of an object that continues to exist when not perceived and of numerous psychological concepts. This metaphysical perspective and the concepts that are bound up with it is both needed to get the language learning process off the ground and is central to all further attempts to learn elements of language. In short, it is not a peripheral aspect of a child's world view.

Is it possible to learn abstract concepts?

Is it possible that the kinds of abstract concepts that I have portrayed as being innate are in actual fact learned? There are some prominent attempts to explain how we can learn abstract concepts on the basis of our experiences and I will now consider two of these.

Jesse Prinz (2002) has developed an influential theory of concepts – namely, the proxytype theory – according to which all concepts are constructed out of perceptual primitives. He addresses head on the challenge that this theory cannot deal with abstract concepts. He argues that on anyone's account we apply abstract concepts to phenomena that we can perceive and do so on the basis of how we perceive them to be. This implies that perceivable properties

correlate with abstract properties so that the instantiation of the latter can be detected on the basis of the instantiation of the former. He thinks that the upshot of this is that abstract properties can be expressed or encoded by means of perceptual representations.

My objection to Prinz's line of thought runs as follows. Suppose that we concede that a particular abstract property reliably correlates with certain perceptual ones. It wouldn't follow from this that the abstract property could be expressed or encoded by means of perceptual representations. This is because the mere correlation of two properties x and y does not imply that in representing an object as a y one is thereby representing it as an x ; in addition, one needs a distinct representation that facilitates representing the object as an x *as such*. This can be seen by considering a simple example. Suppose a person is familiar with a particular species of bird for which she has a concept. She notices that members of this species come in two colours, namely, black and brown. Unbeknownst to her the colour of the birds correlates with their sex, the black ones being male and the brown ones being female. Because of her lack of knowledge of the link between colour and sex she does not represent a bird of this species as being female in representing it as being brown. In other words, the mere correlation of sex and colour does not imply that in representing a bird as having a particular colour one is thereby representing its sex. Consequently, in order to represent a bird's sex one needs a representation distinct from representations of colour. This undermines Prinz's line of thought by suggesting that one cannot represent something as having a particular abstract property by merely perceptual means even if there is a correlation between that abstract property and certain perceptual properties. Therefore, Prinz has not shown how abstract concepts can be built out of perceptual resources and so learned on the basis of perception.

A second attempt to explain how we learn abstract concepts on the basis of concrete concepts is suggested by George Lakoff and Mark Johnson's treatment of metaphor (Lakoff and Johnson, 1980; Lakoff, 1987). According to Lakoff and Johnson metaphor is ubiquitous

in language and thought. In cases of metaphor we understand a concept or word on the basis of analogy with some more concrete concept. For, example, suppose a colleague says that they cannot join me for a coffee because they are currently bogged down answering a backlog of emails. I won't understand them as been literally stuck in a bog and unable to move whilst on a walk through the countryside. But I will understand their situation as being analogous to that in that they are currently unable to extract themselves from their office until they have answered a large volume of emails.

For Lakoff and Johnson not all of our concepts are metaphorical; rather, there is a stock of concepts that form the basis of our metaphors, that provide the analogies in terms of which the metaphors are understood. Such basic concepts relate to our perceptual experiences of the outside world and to our bodily experiences. For example, we often conceive of mental states in spatial and postural terms as when we say such things as:

“I'm feeling down today” to attribute a state of depression or a lack of enthusiasm.

“She is walking with a spring in her step” to attribute a state of confidence, happiness or enthusiasm.

“You should walk tall after your recent successes” to tell someone they should be proud of their achievements.

This treatment of metaphor suggests one way of dealing with the charge that abstract concepts cannot be learned. The suggestion is that we learn such concepts on analogy with more concrete concepts relating to perceptual and bodily experiences. So for example, an individual could learn concepts for psychological states on the basis of a prior understanding of spatial concepts and concepts relating to posture and manner of locomotion.

I accept that metaphor is commonplace in language and that when we appreciate the aptness of a metaphorical expression we often do so by noting an analogy between two distinct domains. However, I am sceptical of the claim that metaphorical extension provides a reliable way of acquiring new abstract concepts. The basic problem is that one can only appreciate the aptness of the metaphor when one has a prior grasp of the concept expressed in metaphorical terms. For example, I appreciate the aptness of the expression “walk tall” as a term meaning *proud* because of my understanding that people who are proud often hold themselves very upright as opposed to those who are ashamed who often slouch. Similarly, I appreciate the aptness of “down” as a term for depression as I know that depressed people typically do not hold themselves upright and spend a large proportion of their time lying or sitting down and are difficult to coax into activity that involves them being physically up and active. In short, I have a theory about such psychological states and how they manifest themselves in behaviour and this theory enables me to understand and appreciate the metaphorical expressions. But having such a theory requires having the psychological concepts in question. In other words, prior possession of the target concept is necessary for appreciating the aptness of its metaphorical expression. Thus, if one didn't have the target concept, the metaphorical expression would appear opaque. This suggests that one cannot learn abstract concepts on the basis of a prior possession of more concrete concepts as without a grasp of the target abstract concepts one just would not be able to appreciate the relevant analogy.

Conclusion

Acquiring knowledge of language is one of the most important cognitive develops that we undergo as children. A key element of this development involves building a vocabulary each item of which consists of a pairing of a sound and a meaning that is represented in the mental lexicon. In this chapter I have discussed the question of how we acquire the meaning side of

these pairings and have assumed that such meanings are constituted by concepts. I have argued that although learning does play an important role in vocabulary development in that we have to learn the conventions governing sound-meaning pairings that hold in our home linguistic communities, such learning is only possible because we have a battery of abstract concepts and an associated metaphysical perspective on the world that is part of our innate endowment.

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