On the Origins of Human Questioning

by

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For Anna Denton,

with thanks for a long and lovely conversation
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What is a Question?

My investigation began with some reflection on the finding, to which I was first introduced through research for a Primate Behavior course with Professor Joyce Powzyk, that non-human primates do not appear to ask questions. At first reading, this may not sound like a particularly shocking revelation. After all, there is a large swath of behaviors that are exhibited by one primate species and not by others. Question asking is an interesting case, however, because non-human great ape linguistic research has uncovered significant latent capacities for language in common chimpanzees, bonobos, gorillas, and orangutans. Non-human primates have not only acquired large vocabularies in signed and lexigram languages (Gardner and Garner 1969)(Raffaele 2006), but have used these vocabularies to perform sophisticated linguistic tasks including sentence formation (Gardner and Garner 1969)(Terrace et. al 1979, 895), displaced reference (Miles 1990, 528)(Gorilla Foundation n.d.b), and deception (Miles 1990, 529). Given the numerous and complex linguistic feats displayed by non-human primates, it is surprising that question asking, which appears earlier in human development than many of these other abilities, should not be present.

The finding that non-human primates do not ask questions suggests a philosophical and biological problem that I will refer to as the Question of
Questioning. This problem might be most easily posed as: why don’t non-human primates ask questions? However, such a formulation relies too heavily upon the anthropocentric assumption that other primates or intelligent beings ought to behave as humans do. I suppose this formulation also misses some of the most intriguing and human aspects of the problem. Perhaps a more interesting and fruitful formulation of the Question of Questioning is: why do humans ask questions?

There are a myriad of ways one could attempt to address such a problem. One could conduct behavioral studies to determine the functions that questions serve for contemporary humans—and indeed some such studies will be referenced in this essay. One could approach the issue from an abstract linguistic perspective, drawing upon speech act theory to categorize exactly what constitutes a question (this has been done and will also be drawn upon) and derive from there why questions are generally performed. In this essay, however, I have chosen to pose and address the Question of Questioning from an evolutionary biological perspective. Among other reasons, I have chosen this approach because I believe that an evolutionary account of questioning presents an opportunity for interesting interplay with the growing body of work in naturalistic philosophy of mind. I will be drawing upon work by philosophers of mind and of science, psychologists, non-human primate researchers, and more. At the core of my approach, however, is an evolutionary query: how and why did question asking evolve in humans? My hope is that in formulating an answer, I will be addressing the Question of Questioning as well. If I can present a robust account of the evolutionary origins of human question asking, then perhaps it will be
unsurprising that non-human primates do not ask questions. If questioning is an outcrop of our specific evolutionary history sometime after our divergence from our closest living relatives (common and pygmy chimpanzees), then one would not expect the latent capacities for linguistic behaviors we find in other primates to be sufficient for questioning.

The form of my answer to the Question of Questioning will be an evolutionary stage theory. I will propose three stages, based loosely around those put forward by psychologist Michael Tomasello in A Natural History of Human Thinking. In contrast to Tomasello’s stages, however, each of the stages I propose will center on a type of question. At each stage, I will attempt to demonstrate how a particular sort of questioning would have been enabled by and played a crucial role in that phase of early human evolution. Ultimately, what I am attempting to demonstrate is the special character of questioning, as opposed to other linguistic forms. Questioning, I will argue, is not an ad hoc linguistic ability that arrived late along with any number of other such behaviors. Rather, it is fundamental to and constitutive of a constantly transforming human way of life.

So, my answer to the Question of Questioning will consist primarily of a threefold evolutionary stage theory. Before I can present in detail the relevant evolutionary stages, however, I must do some preliminary work. In this chapter, I will seek to establish the relevant vocabulary to be used throughout the remainder of the essay. First, I will endeavor to explain the theory of evolutionary niche construction and how I will use it in my stage theory. Second, I will turn to the term ‘question’
itself. I have included a brief review of some relevant speech act and pragmatics theory, especially as it relates to questioning. My aim with this section is not make any groundbreaking claims about the constitution of questions as speech acts but rather to provide some context for my general treatment of them going forward.

In the next chapter, I will conduct a thorough literature review of non-human primate language studies, looking at question asking (or lack thereof). My hope with this chapter is to establish, using empirical research, that the evolution of questioning involves more than the application of latent capacities for language in all primates. Rather, it seems that questioning behavior is an outcrop of the particular evolutionary history of humans. Furthermore, it is surprising, given what we know of human developmental timelines and the sophisticated linguistic abilities of non-human primates, that questioning behavior does not appear in linguistically enabled non-humans primates. The conclusions drawn in this chapter will help to further explain why the stage theory to come is interesting and worthwhile.

Each of the three stages of my theory of questioning will be examined in a dedicated chapter. These stages are loosely correlated with three evolutionary transitions outlined in psychologist Michael Tomasello’s recent book *A Natural History of Human Thinking*. At each stage, I will orient us in terms of Tomasello’s account, while also making clear the points where I disagree with his approach. I will, for each stage, begin with a broader review of the relevant philosophical material and then apply it to that particular moment in question evolution. Each stage will be, for clarity and precision, encapsulated by an interrogative word.
The first stage concerns the question ‘What?’, a shorthand for what I call *factual* questions. I will outline Tomasello’s account in detail, and proceed to explain how, in the context of his findings regarding early human collaborative behavior, factual questions would have emerged. The second stage concerns *instructional* questions, characterized by the question ‘How?’. This chapter will draw upon Tomasello’s work as well as that of philosopher Kim Sterelny. I will demonstrate how Sterelny’s apprentice learning model can be productively integrated with Tomasello’s evolutionary framework. From there, I will show that ‘How?’ questions would have likely played an important role at this stage and speculate about how they arose. Finally, the third stage will examine the question ‘Why?’, emblematic of *normative* questions. Here, I will integrate Tomasello’s work with that of philosopher Joseph Rouse. Rouse reworks traditional notions of conceptual understanding, objectivity, and normativity to create a naturalistic account of a conceptually articulated human way of life. I will attempt to demonstrate that normative questions are essential for the way of life that Rouse puts forward.

It is difficult to elucidate in any detail what will be argued in the coming chapters without first reviewing the work of Tomasello, Sterelny, and Rouse. I hope that I have at the very least provided a general sense of the structure that this essay will take, as well its central project: to construct a three-stage evolutionary-philosophical theory of the emergence of human question asking. I will now, before proceeding to the tasks outlined above, address what I understand to be the most closely-related published work on this topic.
Who Asked the First Question?

It is important to make note here of the inspiration I derived from the work of Georgian-Australian ethnomusicologist Joseph Jordania. His 2006 book entitled *Who Asked The First Question? The Origins of Human Choral Singing, Intelligence, Language and Speech* was essential in helping me realize the significance of the evolutionary conundrum posed by question asking. Like me, Jordania was struck by the finding that non-human primates do not appear to ask questions. While our approaches are entirely different, the inspiration for this essay is similar to that of *Who Asked The First Question*. Jordania was surprised by the lack of academic work on the evolution of what he calls “the question phenomenon” (Jordania 2006, 328). He recognized that question asking is of such great significance in human communication (and life, more broadly) that its evolutionary origins merit further attention and consideration (329). As I will in the next chapter, Jordania turns to primate language research to substantiate his intuition that there is something different about questioning as compared to other linguistic forms (335). That said, he does not, as I will, construct a full review of the relevant literature. Thus, the points of overlap between this project and Jordania’s book are as follows: a) it appears that non-human primates do not ask questions, b) question asking is an important facet of the human way of life, and c) as such, its evolution warrants further speculation.

Just as it is important to explicate the similar inspirations of our work, it is equally important to be clear regarding how different my project is from that of Professor Jordania. Perhaps unsurprisingly, given his background, Jordania focuses
primarily on issues surrounding question intonation. Indeed, he was originally drawn
to exploring the evolution of questions after noting the universality of human question
intonation (Jordania 2006, 328). He goes on to craft some fascinating connections
between certain types of polyphonic phenomenon singing behaviors and
conversational types (e.g. relating antiphonal and responsorial singing to dialogue,
and questioning by extension) (329). Beyond intonation, the only other evolutionary
prerequisite he explicitly references is curiosity (339). While I consider both
innovation and curiosity to be fascinating topics of high relevance to the origins of
questioning, neither of them will be explored in any length in this essay.

Beyond the disparate foci of my and Jordania’s essays, the most significant
point of divergence between the two is our differing evolutionary approaches.
Jordania outlines ways in which question asking would have been advantageous for
early humans, but for the most part remains relatively vague in his account (Jordania
2006, 331-2). His ultimate proposition is that certain early call-and-response singing
practices laid the foundation for the question intonation (334), and that in
combination with increasing sociality (334), this predisposition eventually led to a
genetic mutation that enabled the first human to ask a question (333). As will be
evident in the coming chapters, my project takes a significantly different evolutionary
approach. I will relate the emergence of questioning to processes of ongoing change
encompassing many facets of organism and environment, including various forms of
human cooperative behavior. In particular, I will be drawing upon theories of
evolutionary niche construction, whereby the organism continuously constructs its own environment through its behavior.

**Niche Construction**

Niche construction is a powerful tool for rapid evolutionary change because it can create a kind of feedback loop when combined with received notions of natural selection. Organisms choose and impact their environments through their ecological activity in a myriad of isolated and patterned behaviors. In this sense, they can be described as constructing their own environment (Laland, Odling-Smee, and Feldman 2001, 117). As organisms shape the nature of their world, they are also shaping the selection pressures to which they and their descendants are exposed (120). Those traits and behaviors that will be advantageous in the niche constructed environment are, then, partially resultant from those traits and behaviors present in current or past generations. A feedback loop emerges when organismal activity of a certain kind shapes the environment such that traits and behaviors of that kind will be selected for, which will then further shape the environment such that those kinds of traits are adaptive, and so on (119). Through this exploitation of a niche, evolutionary change could occur on a more rapid timeline than would be expected under traditional theories of natural selection (122). The reason for this is that the organism and environment are evolving in tandem, creating unusual evolutionary dynamics. Rather than a changing organism evolving to be well adapted to a static environment, niche construction highlights the possibility of a system in which with each subsequent
generation, both organism and environment become more specialized to exploit a particular niche, and simultaneously shape each other to further perpetuate and intensify that niche.

For the purposes of this essay, niche construction will play a crucial role in addressing an evolutionary conundrum known as Wallace’s Problem. Alfred Russel Wallace was a contemporary of Charles Darwin who recognized that the rapidity and scope of human cognitive evolution could not be accounted for by standard natural selection (Bickerton 2014, 2). Wallace chose to resolve the dilemma through spiritual means, and while Darwin was less convinced of the problem, he suggested that if a solution was needed it would likely derive from human linguistic capacities (4).

Based on typical expectations associated with traditional evolutionary theory, our rapid, rather than gradational, development of highly divergent cognitive capacities is indeed surprising (2). The cognitive ability that “nature needed” for humans to thrive was only marginally superior to that of other apes (2). Somehow, though, our capacities developed far beyond what standard modes of evolutionary understanding would lead us to expect and positioned our species as uniquely possessed of certain cognitive features, including question asking. Niche construction, and various resultant developmental-evolutionary feedback loops, will help to explain certain rapid changes in early human cognition and behavior, question asking being central example thereof in this account.
Is this Philosophy?

There may be, at this point, some uncertainty regarding the domain of my project. I will be drawing heavily upon research in evolutionary biology, developmental psychology, and primatology. My work will also be addressing points of inquiry that are no doubt relevant to these fields. It is ultimately not of especially high consequence, given the deeply interdisciplinary nature of the topics at hand, in what domain I or others locate this essay. An effort of this kind ought to be convincing to members of any related field, as well as to those with little relevant experience at all. That said, I consider this essay to be a work of philosophy for a number of reasons.

Firstly, I have taken an approach that is more in keeping with the conventions of the philosophical tradition than those of any other related domains. While the essay draws upon a great deal of empirical research, I have chosen to explore my area of interest not through original empirical research, nor through formal literature review (perhaps with the exception of that in Chapter 2), but rather in the form of an argumentative essay.

Secondly, the authors I have built my argument around—namely Michael Tomasello, Kim Sterelny, and Joseph Rouse—are all considered to be working, for the most part, within the philosophical discipline. Both Sterelny and Rouse are well-established philosophers, and Tomasello is somewhat of a special case. While his training is as a psychologist and he continues to conduct original research in evolutionary and developmental psychology, his book *A Natural History of Human*
Thinking, which will play an essential role in my account, is as much a philosophical project as a psychological one. The book has been reviewed and responded to by a wide variety of philosophers, and engages numerous ongoing philosophical discourses, as we will see in Chapter 3.

Finally, I consider this essay a work of philosophy because the questions addressed by my account are of special relevance to the philosophical discipline. It will engage with debates regarding how we ought to understand and identify conceptual thought/articulation, normative thought/articulation, and intentionality in humans as well as the myriad of different kinds of minds that exist. Additionally, my account will build upon a burgeoning effort to construct and maintain a mutual accountability between philosophy of science and philosophy of mind. Question asking, as I will argue, is an essential mechanism for ongoing normative negotiation, of which philosophy is one particular kind. In providing an evolutionarily viable (if quite speculative) account of how questioning may have arisen, I will by extension be constructing a fully naturalistic account of the capacities that enable philosophy and other normative practices.

Defining Our ‘Question’

Having established the motivation, inspiration, intent, and methodology for my project, we are left still with a significant remaining task: the definition of our central term. An independent essay of equal length could be written on the topic of defining what exactly constitutes a question. Indeed, the definition of a question is a
topic not resolved in any sense in the philosophical community. Because the linguistic classification of questioning is not the primary focus of this essay, however, a brief characterization will have to suffice for the present.

I will not be constructing any kind of comprehensive review or analysis of questioning as a linguistic form. Rather, I will draw upon some basic speech act theory in order to construct a plausible definition of questioning that will help ensure consistency and avoid some points of confusion in the coming chapters. We begin by looking at the *Speech Acts*, a foundational text written in 1969 by philosopher John Searle. While numerous challenges to Searle’s work have been raised since its publication—one of which will be discussed below—it still serves as a useful starting point for understanding speech act theory as it relates to and differs from other sorts of linguistic models.

Searle begins by introducing language as a rule-governed form of behavior (Searle 1969, 22) rather than a system of abstraction, as it is commonly conceived of (12). Being something we do rather than a fixed symbolic system, language is fallible (14). Linguistic characterizations are based in the knowledge and intuition of the speaker and are riddled with mistakes and ambiguities (14). Following from the characterization of language as a behavior, we must understand the basic unit of language to be speech acts rather than words (16). It is performances, not the symbols themselves, which constitute the essential parts of linguistic expression.

Searle begins crafting his speech act theory by drawing a myriad of distinctions. He distinguishes four types of speech acts: utterance acts, propositional
acts, illocutionary acts, and perlocutionary acts (Searle 1969, 24). These are not separate things that speakers do but rather three parts of an integrated behavior with different “identity criteria” (24). That is, different features of the behavior serve to define the utterance, propositional, and illocutionary acts that may or may not be occurring. Utterance acts are the physical production of sounds, which may or may not be accompanied by proposition or illocutionary acts. Propositional acts are referring and predicating acts (26). Note that expressions, not universals, are predicated to objects in Searle’s model (26). Referring expressions are picked out by their function: that is, they are used by a speaker to point to something (27). A propositional act is always expressed as part of an illocutionary act (29). That said, propositional acts cannot be used to determine the illocutionary act in progress. Because the same reference and predicates can appear in the performance of different illocutionary acts, they are largely un-useful for contrasting such act types (23).

An illocutionary act is a complete speech act which delivers, through a typical utterance, propositional content (references and a predicate) as well as what Searle calls “illocutionary force” (Searle 1969, 30). Illocutionary force indicators show how propositions are to be understood (30). Examples of illocutionary force indicators include: word order, stress, punctuation, verb mood, and many others (30). Finally, Searle identifies an additional fourth type of speech act, dubbed the perlocutionary act. Perlocutionary acts are the consequences of an act on the hearer(s) (25). Such consequences could include: persuading, alarming, inspiring, or enlightening one’s hearer (25).
Having established his central four categories for speech acts, Searle begins the arduous process of laying out rules for these acts. There are two categories of speech act rules: regulative, which govern the particulars of pre-existing patterns of behavior; and constitutive, which serve to create new and distinct patterns of behavior (Searle 1969, 33). While regulative rules can generally be expressed through an imperative (34), constitutive rules often take the form: X counts as Y in context C (35). The creation of new constitutive rules generates the possibility for new kinds of activity (35). It must be noted that some illocutionary acts can be performed outside of natural language, or any other system of constitutive rules (38). Nevertheless, there are many illocutionary acts that can be performed only through engagement with such a system (39). Searle observes that his dog is capable of performing a certain set of illocutionary acts but is barred from others by his linguistic limitations (39). Different human languages can be understood as differing conventional realizations of the same constitutive rules (39). Strange though it may seem, there need not be penalties for diverging from constitutive rules (41) and we can follow these rules without being aware of them (42).

An illocutionary act is distinguished from a mere sound utterance by two factors: having meaning and meaning something (Searle 1969, 42). Searle uses Paul Grice’s notion of “non-natural meaning” as a starting point: a speaker means by intending their expression to produce an effect in a hearer (43). Moving beyond Grice, however, Searle observes that meaning is a matter not only of intention but also of convention (45). The speaker succeeds when the hearer recognizes what the
speaker is trying to do (47), and this goal is usually reached through the application of conventional utterances. Searle concludes his second chapter by distinguishing brute and institutional facts. Brute facts are essentially physical and/or mental (50). Meanwhile institutional facts are facts that exist only under the presupposition of various human institutions (51). Note that those institutions are themselves systems of constitutive rules (51).

Searle begins his third chapter by laying out the methodology he will employ for determining semantic rules for illocutionary acts: first he will determine the necessary and sufficient conditions for an illocutionary act and then will derive rules from those conditions (Searle 1969, 22). He examines the act of Promising to exemplify his method and begin to formulate some semantic rules for illocutionary acts (57-61). Following his analysis of Promising, Searle puts forward nine general hypotheses about illocutionary acts:

1) If a psychological state is specified, that act constitutes a (sincere or insincere) expression of that state (65).

2) Insincerity is only possible where a psychological state is expressed (65).

3) The preparatory condition tells us that what the speaker implies has already been satisfied. That is, those conditions that are assumed to have been met at the time of the illocutionary act (65).

4) An utterance in a given context can indicate the satisfaction of an illocutionary act’s essential condition, even without use of the explicit
Illocutionary force-indicating device (68). For example, Searle notes that in the sentence “Could you do this for me?”, the speaker uses the interrogative illocutionary force-indicator device to utter a Request (68).

5) Where the illocutionary force of an utterance is implicit, it can be made explicit (68).

6) Certain illocutionary acts are special cases of other illocutionary acts (69).

7) Usually the conditions of an illocutionary act are functions of a single essential condition (69).

8) Illocutionary force and illocutionary acts are distinct notions (70).

9) Some illocutionary verbs can be defined in terms of intended perlocutionary effect while others cannot (71).

All of these hypotheses have interesting applications for question asking, but one in particular has already addressed what may be the points of ambiguity most relevant to this essay. Hypothesis #4 speaks to the most frequent challenge I have heard raised in response to my project: namely, that interrogative illocutionary force-indicator devices (be that intonation, a question mark, use of key interrogative words, etc) is regularly appropriated for other illocutionary acts besides Questions (namely, as Searle notes, Requests). This point is among the primary reasons that I chose to include Searle’s work. His terminology renders this previously ambiguous distinction more evident. The distinction between illocutionary act and the
illocutionary force-indicating devices will be important moving forward for two reasons.

First, we will, in the next chapter, be reviewing and analyzing non-human primate linguistic behaviors in terms of their relevance to question asking. It will be essential to this endeavor to understand that the use of an interrogative illocutionary force-indicator device does not necessarily mean that the illocutionary act being carried out by the non-human primate is a Question. Requests, both by humans and other linguistically-enabled primates, can often resemble Questions in form but not meaning. A useful marker for distinguishing the two (note that this claim is mine and not Searle’s) is that a Question leaves open the possibility for ‘no’ as an appropriate answer.

Second, we will, in subsequent examination of questioning behaviors in early humans, face the opposite circumstance: the performance of a Question illocutionary act without the use of familiar interrogative illocutionary force-indicator devices. Note that this does not necessarily mean that there were not any, either persisting or now obsolete, indicator devices being used. Rather, it is simply useful to remind ourselves that, throughout this evolutionary account of questioning, we must not couple the act of question asking too closely with any particular illocutionary force-indicator device. While I will be offering broad suggestions at each phase as to how Questions may have be communicated, these specifics are less important for our purposes than the presence of the act of questioning itself, in whatever form it may have been. Before concluding our discussion of Searle, it will be useful to briefly
review his treatment of Question as an illocutionary act in the terms outlined by his
nine hypotheses.

Questions can contain any type of propositional content. They hold two
primary preparatory conditions: first, that the speaker does not know the answer, that
is the information needed to truly complete the proposition; second, it is not obvious
to the speaker and hearer that the hearer will provide the relevant information
unprompted. The sincerity condition for Questions is that the speaker really wants the
relevant information. The essential condition is that the act is an effort on the part of
the speaker to elicit information from the hearer. Finally, Seale specifies two types of
questions: real and exam. In real questions, the speaker wants to learn the answer,
while in exam questions, the speaker merely wants to learn if the hearer knows the
answer (Searle 1969, 66). In this essay, real questions will be of greater relevance,
although it is not difficult to imagine how the evolution of real questions would have
also made way for the emergence of exam questions.

While Searle’s account offers some useful language for picking out important
distinctions regarding question asking, his theory has certain shortcomings that call
for the incorporation of additional perspectives. We will now be leaping ahead 40
years from Searle’s *Speech Acts* to ‘Yo!’ and ‘Lo!’: The Pragmatic Topography of the
Space of Reasons by Rebecca Kukla and Mark Lance. This account will serve to
situate our primarily pragmatic view of language within a more appropriate
understanding of mindedness, as well as to further (if indirectly) underscore the
philosophical importance of questioning.
In ‘Yo!’ and ‘Lo!’, Kukla and Lance argue that, looking at the typical “division” of language into syntax, semantics, and pragmatics, the privileged place of semantics ought to be granted instead to pragmatics (Kukla and Lance 2009, 5). While they acknowledge that formal theories such as Searle’s, which explicitly, systematically, and (hopefully) holistically characterize speech acts, have an important role to play in deciphering the pragmatic composition of language, they take issue with a number of assumptions that underscore his work (5). One problem is that Searle’s account, despite being innovative in its incorporation of the pragmatic, still bestows explanatory priority onto semantics (7). Rather than defining speech acts in terms of their use, as Kukla and Lance would have us do, Searle presents the pragmatic nature of language arising secondarily from its grammar (7). Accounts such as Searle’s are predicated upon the existence and priority (with relation to language) of internal, representational mental states (7). Thus, a strange detachment arises between mind and world, where the pragmatics of language are reduced to the various ways in which a person can choose to use grammatical forms to express the contents of pre-existing thoughts (7). Kukla and Lance, among others, reject this notion of internal mental states, emphasizing instead that mental commitments are actually observable things in the world (79). This revised conception of mental states enables the pragmatic to truly come first in characterizing speech acts, because there is no prior mental representation for it to connect to through grammar (7). While the notion of mental states will be further challenged and reconceived later in this essay, let us from here forward take them to be observable features of discursive practice.
In contrast to Pittsburgh School Pragmatists such as Robert Brandom, Kukla and Lance are not claiming that semantics is reducible to pragmatics (Kukla and Lance 2009, 6). They remain agnostic on this point, claiming instead only that pragmatics have explanatory priority over semantics (and syntax for that matter) (6). That said, ‘Yo!’ and ‘Lo!’ makes use of certain terms inherited from the Pittsburgh School, including reference to a ‘space of reasons’ (6). Philosopher Wilfrid Sellars was the first to place humans within the ‘space of reasons’, in which one must be situated within a normative discourse, responsive to reasons as such, and attuned to standards of truth and appropriateness (1). Kukla and Lance use this terminology to describe the discursive environment which is both essential for and made up of the types of practices they are characterizing. The notion of a space of reasons will be important throughout this project, but especially in Chapter 5. It will play an important role in helping us characterize a distinctly human way of life, of which questioning is an important facet, that arose following the self-organization of early humans into larger groups.

While Kukla and Lance do not address the topic of question asking specifically at much length, their account is highly relevant and useful to our project for a few reasons. The two primary claims of ‘Yo!’ and ‘Lo!’ are as follows: 1) that the pragmatic, rather than semantic, structure of language is most relevant to broader philosophical issues (Kukla and Lance 2009, 5), and 2) that declarative assertions are not the only speech acts of serious philosophical significance (12). Both of these
claims are direct challenges to previous speech act literature and they both play important roles in laying the groundwork for my account.

An approach to language that prioritizes the pragmatic, but remains agnostic regarding the reducibility of the semantic, is ideal for an evolutionary account of a speech act such as mine. As we will see, it is the pragmatic features of questioning that will do the work of explaining its emergence and development. That said, as Kukla and Lance point out, speech acts are meaningful through their location within a larger collection of discursive practices (Kukla and Lance 2009, 7). This conception of meaning will be essential to my account as well. Thus, to definitively dismiss semantics as fully reducible to pragmatics would be an oversight. The second primary claim of ‘Yo!’ and ‘Lo!’ is essential for this essay as well. By combatting the philosophical prioritization of declarative assertions, Kukla and Lance make way for accounts such as mine, which aim to characterize other speech acts (in this case, questions) as philosophically important and interesting. Finally, it is significant that Kukla and Lance’s account, in contrast to Searle’s, is compatible with a conception of mindedness more appropriate in this context. Here I am referring to our discussion above of mental states, to be elaborated further in the coming chapters.

Among the most important insights of ‘Yo!’ and ‘Lo!’ is its characterization of vocatives and acknowledgements. A vocative is a hail: an act which simultaneously recognizes another individual and calls upon them to recognize your appropriate recognition (Kukla and Lance 2009, 138). Acknowledgements are also recognitive, but in a different sense. Rather than recognizing any fact or individual, they recognize
the “force of a normative claim” (148). Kukla and Lance argue that all speech acts contain a transcendental vocative: they are essentially second personal in that they hail acknowledgement (153). Speech acts form normative claims aimed at their target and call out for the target to recognize that they are caught up by these normative claims and acknowledge their status as such (153).

The relation of this transcendental vocative characterization of speech acts to questions should be quite evident, as the norms that constitute questioning make it relatively simple to define in these terms. The asking of a question is a vocative act in that it recognizes the target as possessed (as a feature of their partially shared environment) of information—or opinion in the case of normative questioning, to be discussed in Chapter 5—that the asker does not possess themselves. It calls for an acknowledgement, either an answer to the question or some type of refusal to answer, in accordance to the normative claim contained in the question and the surrounding system of discursive practice.

I hope that this review of two important works of linguistic theory, in themselves and as they relate to this project, will help to provide some context for my treatment of questions going forward. To summarize, I understand questions to be transcendental vocative speech acts whose meaning arises as a feature of the larger system of discourse within which the act is situated. A question may be performed using a wide variety of surface grammars or even in the absence of conventionalized language, but can be identified as a question by its calling out for a particular kind of response (i.e. the offering of information/opinion) from its target.
Looking Forward

This project is dually motivated in the following sense: while its primary objective to generate a new theory of the origins of human questioning, it also serves to further articulate the theories of Tomasello, Sterelny, and Rouse. The topic of question asking is only minimally explored in each of these accounts. For reasons that will become apparent later in this essay, I believe that each of them can benefit from a more explicit consideration of the role of questioning. Thus, whether or not I am ultimately successful in crafting a convincing stage theory of questioning, this project will have been fruitful in its expansion of three compelling naturalistic accounts of human cognition.

To a similar effect, the following chapter will serve a function both within and beyond the project of a question asking stage theory. Within the theory, it will serve to lay the foundation for claims I will make regarding the timeline and nature of the emergence of various questioning forms in early humans. Beyond this project, it will fill an apparent void in the literature: a comprehensive review of the question asking data in non-human primate language studies. Such a review is a worthwhile project because while numerous individuals have referenced the finding that non-human primates do not ask questions (Pullum 2004)(Jordania 2006, 335), I was unable to locate a scholarly article aggregating the empirical evidence relevant to this claim.
It may seem like somewhat of a digression to preface my theory of questioning with a non-human primate behavioral research literature review. For various reasons, however, I believe it is a compelling and invaluable component of my account. This chapter will be filling an apparent gap in the existing literature on the subject because, as mentioned at the end of the previous chapter, I was unable to find a review of non-human primate language studies that focused on findings relevant to question asking. My construction of this review, however, is motivated most immediately by the role it will play in my broader account of the origins of questioning.

The stage theory to come will be an explanation and elaboration of the following claim: that question asking is not just another late-arriving application of human linguistic abilities but rather emerged gradually, both resulting from and constructing our particular evolutionary history. My argument will begin at an evolutionary stage when hominids have diverged from their closest living primate relatives (common chimpanzees and bonobos). If I am arguing that question asking is resultant from a set of behavioral-biological-environmental circumstances that begin at this stage, it would deeply undermine my theory if other primates displayed questioning behaviors.
Note that I am not claiming that early humans did not draw upon latent capacities present in other primate species (for language, behavioral coordination, etc.) in the evolution of questioning behaviors. Rather, I am seeking to establish that those latent capacities are not sufficient for question asking, thus suggesting that something in our subsequent evolutionary history gave rise to the behavior. In this way, the literature review below is the foundation, motivation, and source of intrigue for my entire project. It is, in a sense, a posing of the question that I will attempt to answer for the remainder of this essay.

Methodology

Although the absence of non-human primate questioning is relatively evident upon reading the canonical studies, there are astonishingly few direct statements of this finding. In fact, I identified only two explicit references to the finding. The first is in Joseph Jordania’s book on the origins of choral singing, where he writes, “Analysis of their conversations shows that in human-primate conversations questions are asked by the humans only… [non-human] apes understand them and give appropriate responses, but amazingly then themselves do not use question words in conversation with their human teachers” (Jordania 2006, 335). As we will see, the use of question words by non-humans is somewhat more complicated than Jordania suggests, but his claim certainly points to an important anomaly to consider. The second reference to the absence of non-human primate questioning is in a blog post by linguist Geoffrey K. Pullum where he writes, “I do not believe that there has ever been an example
anywhere of a non-human expressing an opinion, or asking a question. Not ever” (Pullum 2004). While the absence of non-human primate questioning seems to be an understanding held by at least some thinkers in related fields, there exists no literature review corroborating the claim. As such, although the primary task of this essay is to situate the Question of Questioning within various philosophical projects, it is of the utmost importance that I first construct a robust demonstration of the finding itself.

Posing the Question of Questioning requires empirical substantiation of two postulates: first, that non-human primates do not ask questions; and second, that this is surprising and significant given their other apparent linguistic abilities. The relevance of the first postulate is outlined above, though its empirical justification will prove somewhat tedious to demonstrate. Because a literature review has never been done on this topic, a thorough assessment of the relevant publications is necessary. Given the nature of my task—that is, to demonstrate the absence of a linguistic ability—I will have to regard as significant not only studies that cite a lack of questioning but also those that simply make no reference to questioning whatsoever. As such, the most viable strategy for substantiating this first postulate is to address (if only briefly) in turn each notable primate language study as their findings relate to the Question of Questioning. This strategy, though it may seem somewhat laborious and repetitive, will ensure all the relevant findings thus far point to non-human primates not asking questions. Additionally, it will serve as an opportunity to more generally outline and introduce a body of research that is highly relevant to the issues addressed in this essay.
The second postulate, while perhaps less obvious, is equally essential to my project. If I cannot show that the absence of questioning in non-human primates is an anomaly in the broader context of their linguistic accomplishments, then the Question of Questioning is ill-posed. In that case, I may as be asking why non-human primates do not quote Seinfeld or compose poems in iambic pentameter. The second postulate will require reflection not only upon the linguistic development of non-human primates but also that of human children. The typical developmental sequence of human language provides a baseline regarding which linguistic behaviors might be expected to emerge at each increasingly sophisticated stage of development. Because, as I will demonstrate, questioning is well within the range of expected behaviors given the apparent developmental stage of various non-human primate subjects, its absence is indeed significant.

That non-human primates do not ask questions is a difficult finding to demonstrate for a number of reasons. First, a universal negative (or any kind of universal for that matter) cannot be proven using inductive reasoning, according to the rules of formal logic. The best we can hope for in this case is to demonstrate that non-human primates appear thus far to have not asked questions in any documented research setting, implying (by no means conclusively) that they more generally do not ask questions.

The second reason this finding is difficult to demonstrate is that researchers tend not to address it directly. While I am confident that any presence of question asking would absolutely have been reported and reflected upon (more on this below),
its absence seems to be regarded as less notable. While I hope that the reader will
disagree with this position upon reading my substantiation of the second postulate, I
do have a theory as to why the lack of question asking is not often directly addressed.

It is no secret that researchers tend to focus on the ‘successes’ of their studies;
that is, the novel or exceptional outcomes arising from their work. In research areas
such as non-human primate language acquisition, expansive linguistic capacity tends
to be considered the remarkable outcome and linguistic limitations considered, for the
most part, unremarkable. This dichotomy arises from our historical belief that
language was a uniquely human phenomenon. The earliest successes of non-human
primate language research challenged this belief, but that history still colors our
interpretations. If the lack of questioning is understood in this context as
unremarkable, it stands to reason that it would not be explicitly stated in much
published research. I would argue that researchers are incorrect not for prioritizing the
perceived successes of their studies but rather for regarding the lack of questioning as
uninteresting.

Finally, it is important to note that I will be assuming that in studies which
make no reference to questioning, their subject did not ask any questions. This
assumption is justified given the detail with which these researchers report other
linguistic accomplishments. While I have made attempts to contact researchers for
explicit confirmation that no questions were asked, in the absence of a reply I am
forced to use my best judgement: that a question asked by a non-human primate
would have been a noteworthy occurrence. Given the evident meticulousness with
which the linguistic behavior of the non-human primate subjects was documented, I consider it highly unlikely that questioning, an as yet never before reported form of speech for non-human primates, could have been observed without being included in a study’s publication. Furthermore, we can be fairly confident that any question that did occur would have occurred in the presence of the subject’s trainers/keepers. We can be relatively sure of this fact in most cases because, in accordance with our transcendental vocative characterization in the previous chapter, question asking requires the presence of a listener, and trainers/keepers made up almost all of these primates’ potential listeners. Thus, I will assume that in studies which make no reference to questioning, their primate subject indeed never asked a question, even if that is not explicitly stated.

I identified relevant articles first by consulting textbook listings of the most significant primate language studies (Strier 2016). Additionally, I conducted searches in numerous relevant journals including *Primates, Journal of Linguistics, American Journal of Primatology,* and *International Journal of Primatology* using the keywords: “question(ing)”, “ask(ing)”, and “interrogative”. Finally, I conducted a series of google scholar searches using the same keywords in addition to: “primate”, “primate language”, and “primate sign language”. Throughout these readings, whenever a study referenced another primate language study as having some relative successes, I added the referenced study to my reading list. The result is what I hope will be a thorough review that addresses all of the most famous and successful
non-human primate language research subjects. The following review is organized by
subject, in roughly chronological order.

**Washoe**

Washoe, a female common chimpanzee, was the first non-human to communicate using American Sign Language (ASL) (Gardner and Garner 1969, 667). Because she was among the earliest subjects of non-human primate language research, I will outline a more detailed account of her language acquisition. I do this somewhat to contextualize her accomplishments, but also to establish a background for the other studies to be explored later. Through Washoe’s case, we can begin to explore the types of considerations and methodologies that have guided non-human primate language research.

Researchers Beatrix T. Gardner and R. Allen Gardner chose to teach Washoe ASL for a number of reasons. Not only is the chimpanzee vocal apparatus very different than that of a human, but so is their vocal behavior. Chimpanzees, like most other great apes, usually only produce vocalizations in response to exciting situations and remain silent when calm (Gardner and Garner 1969, 664). A previous study on home-raised chimpanzee Viki, which involved extensive efforts at linguistic instruction and speech therapy over more than six years, found that she was barely able to produce any recognizable words (664) (Hayes and Hayes 1952). In addition to the limited potential for vocalization in non-human primates, there are positive reasons to suggest that ASL might be more fitting. Unlike vocal language,
chimpanzees (as well as other apes) seem to naturally use communicative gestures in a range of moods and circumstances (Gardner and Garner 1969, 664). That is, they employ gestural communication not only to warn or intimidate in exciting situations but also for a variety of other purposes (664). ASL in particular is a promising mode of communication for two reasons: first, because it is in current use by a lot of humans, it was easy to comparatively evaluate in relation to human speakers and for trainers to communicate exclusively in ASL around Washoe; second, ASL uses a mix of arbitrary and iconic signing, giving researchers the opportunity to evaluate Washoe’s abilities in both of these areas rather than choosing one (665).

The Gardners chose to conduct their study using a common chimpanzee because they are among those animals most likely to have adequate intelligence for acquiring language—although they are not necessarily the absolute smartest non-human animal (Gardner and Garner 1969, 664). Common chimpanzees have been frequent subjects for non-human language research because, alongside the bonobo, they are our closest genetic relatives (Prüfer et al. 2012). Some researchers have questioned the assumption that our closest relatives are inherently most predisposed towards language, however, conducting linguistic studies on animals ranging from birds (Pepperberg 1981) to mollusks (Byrne et al. 2003). I have chosen to primarily focus on primate language research because I am interested in using these studies to better understand human evolution. Given such an interest in our evolutionary history, it stands to reason that I should focus on our closer genetic relatives.
The Gardners, like many researchers interested in teaching human linguistic behaviors to non-human primates, felt that the social environment of their subject would be key to her success (Gardner and Garner 1969, 666). They tried to mimic the environment of a human infant with deaf parents, raised signing in ASL (666). Washoe was surrounded by human companions and activities, with limited containment (666). Her human companions were not allowed to speak English, although other vocalizations such as laughter were permitted (666). As with many non-human primate language studies, imitation was used as the primary method for introducing new vocabulary and correcting inappropriate use of existing vocabulary (666). In this case, signs were mostly introduced through delayed imitation rather than immediate imitation (666). This means that rather than Washoe copying signs directly from her trainers, they would simply communicate with her in ASL and gradually she began to use signs herself that she had observed her trainers using (666). Imitation is a frequently used training method because chimps, as well as other primates, appear to be predisposed toward engaging in visually guided imitation, though this predisposition does not seem to extend to auditory stimuli (666). Instrumental conditioning (that is, the use of positive and negative reinforcement) was used as a secondary means of facilitating language acquisition in Washoe (670). The Gardners justify this methodology by noting that although instrumental conditioning is obviously not the primary means by which human children acquire language, it is
how young children develop so called “trick vocabulary”\(^1\) (668). Washoe was also regularly prompted with simple questions by the researchers (665).

Having established some methodological background, I will now explore Washoe’s case as it relates to the Question of Questioning. When outlining the objectives of the experiment, the Gardners explicitly state that question asking was among their specific goals: “We wanted Washoe not only to ask for objects but to answer questions about them and also to ask us questions” (Gardner and Garner 1969, 665). Here we see the Gardners distinguishing between ‘asking’ in the sense of demanding (a Request, which can use interrogative illocutionary force-indicator devices) and ‘asking’ in the sense of a real Question. In this case, they were interested in Washoe learning both of these behaviors. However, while the Gardners go on to outline numerous cases of Washoe ‘asking’ in the first sense (that is, making Requests), they make no mention whatsoever of ‘asking’ in the second (Question) sense when reporting their results (Gardner and Garner 1969).

Despite her lack of question asking, Washoe’s linguistic accomplishments were vast. She acquired well over 160 signs, which she used repeatedly and consistently (Fouts and Rigby 272). She was able to differentiate between signs with shared referents (e.g. ‘smell’ and ‘flower’) and was able to extend sign use beyond the initial referent used to teach that sign (Gardner and Garner 1969, 670). She began spontaneously combining signs, which eventually became a common mode of signing for her (670). Her human companions often signed to her in combinations, but her

\(^1\) “Trick vocabulary” refers to a period in human linguistic development when the child has learned to use certain vocabulary, but only as a tool for gaining adult approval (Goodenough 171). This phase generally predates active linguistic engagement on the part of the child (171).
behavior was not strictly imitative because she would produce novel combinations. She was even able to produce combinations resembling short sentences (670).

Although the finding was not explored in writings by her researchers, Washoe’s lack of question asking is noteworthy. As previously stated, she acquired ASL through delayed imitation. Given that her human companions regularly prompted her with simple questions, she would have had ample questioning material to imitate, yet she did not. Furthermore, her considerable vocabulary and propensity for combining signs suggest that she had the basic linguistic tools for question asking. We are thus left the wonder what is distinct about the questions that held Washoe back from this particular accomplishment.

Sarah

Sarah is a female common chimpanzee, trained at UC Santa Barbara beginning in 1966 (Premack and Premack 1972, 2). Sarah’s case is of particular interest to us because her researchers were able to draw some compelling conclusions about primate question asking from her behavior (Premack and Premack 1983, 29). She was taught to use plastic tokens of varying shape and color (Premack and Premack 1972, 2). With these tokens, she is able to form and respond to a wide range of linguistic constructions including assessments of similarity (Premack and Premack 1983, 93), yes/no questions (96), and if-then constructions (88). She has a vocabulary of over 130 words (Premack and Premack 1972, 2) and has mastered tokens of various kinds including nouns, verbs, concepts/conditionals, and adjectives (3).
Among the “concept” tokens introduced by her researchers, Ann and David Premack, was an “interrogative” token (4).

The Premacks are among the only primate language researchers I have encountered who not only included question asking as one of their goals, but actually designed a protocol specifically to try to initiate that behavior (Premack and Premack 1983, 24). They decided to use the concept of same/different to teach Sarah interrogatives (24). They would place the interrogative token between two items and Sarah had to replace this token with the correct answer from nearby “same” and “different” tokens (25). Through this method, Sarah was able to master responding to questions mediated by this interrogative token (26), her mastery extending well beyond same/different questions (27). However, when it came to prompting Sarah to ask a question herself, the Premacks found themselves facing a far more difficult and perhaps even impossible challenge. In their words, “Though [Sarah] understood the question, she did not herself ask any questions -- unlike the child who asks interminable questions...Sarah never delayed the departure of her trainer after her lessons by asking where the trainer was going, when she was returning, or anything else” (29).

In order to prompt question asking, the Premacks would leave Sarah to play freely with the relevant tokens after training sessions (Premack and Premack 1983, 29). As with many other non-human primate subjects, Sarah had been taught primarily through imitation and as such, her research team hoped that she would spontaneously ask her own questions imitatively (29). Sarah did this to a certain
extent, but not in the way the Premacks had hoped. During the post-training free time with her tokens, Sarah would painstakingly spell out every question she had been asked during the training session (29). Following each question, she would also imitate her role in the recent training session by quickly replacing the interrogative token with the token corresponding to her original answer (29). She was thus reenacting the exact question and answer sequences from her most recent training.

The Premack postulated that her ability to pose and answer these question constructions to herself indicated the following: that her failure to pose questions to her trainers was not due to an inability to form questions (after all, she was forming them for herself to answer!) but rather a certain kind of lacking motivation (29). As the Premacks put it, “the ape’s failure is due to its inability to recognize deficiencies in its own knowledge. Language training can supply the form of the question, but it cannot teach a creature to examine the state of its knowledge or find deficiencies that impel the desire for information” (29). There are some claims being made here about the specific causes of Sarah’s reticence to pose questions to others that will need to be more rigorously considered later on. The most important point at this moment, however, is that Sarah did not ask a question. Although she reconstructed the interrogative forms to which she had been exposed, she was for whatever reason unmotivated to use that form to obtain information from others (or to construct her own original questions). Given our transcendental vocative definition of questioning, there can be no question in the absence of a target.
In contrast to the difficulties associated with questioning, the Premacks took note of how imperative constructions seemed to come exceptionally naturally to Sarah, and perhaps all non-human primates (Premack and Premack 1983, 24). There are lot of interesting assertions to unpack here, but for now we should simply note that while it seems Sarah came exceptionally close to asking a question, her research team was convinced from her behavior that she, and perhaps non-human apes in general, would probably never do so (29).

Lucy

Lucy was a common chimpanzee, raised like a human child by psychotherapist Maurice Temerlin and his wife during the 1960s and ‘70s (Temerlin 1975, ix). She was taught to use ASL signs by primatologist Roger Fouts (who had previously assisted Washoe’s instruction), mastering well over 100 signs (117-118). Her vocabulary consisted primarily of nouns (proper and otherwise), as well as a more limited selection of adjectives and verbs (121). Even before she began her ASL learning with Fouts, Lucy reportedly demonstrated understanding of certain English phrases (115). She was capable, beginning at age 2, of following complex verbal commands (115).

Lucy’s case is especially notable because of her having been raised in a human environment in total isolation from her own species. Lucy was adopted by the Temerlins as a newborn (Temerlin 1975, 5). Although one previous chimpanzee, Viki, had been raised by a human family for a limited period of time, Lucy was the
first to be raised all the way to sexual maturity because Viki died before this point (xvii).

Temerlin describes Lucy as asking him and his wife to identify objects for her (Temerlin 1975, 120-121). She does this by moving a finger rapidly back and forth, and then pointing to the object in question (120-121). There are two ASL signs for ‘what’: in the first variation, one moves their open palms (facing upwards) from side to side; in the second variation, one points a finger from their dominant hand to the palm of their non-dominant hand and then points to the floor (Lapiak n.d.). In his description of these ‘question-asking’ incidents, Temerlin offers no explanation as to why Lucy’s ‘what’ varied so dramatically from both conventional ASL signs for ‘what’. We are left to wonder whether this may be a case of human over-interpretation of non-human primate gesturing, as Lucy did not use the ASL sign. Nevertheless, Lucy’s is an important behavior to keep in mind going forward, as it is the most compelling case for a question (or at least some kind of vague interrogative gesture) asked by a non-human.

Pointing, long thought to be a uniquely human behavior, is actually well documented in captive chimpanzees (Leavens, Hopkins, and Bard 2005). The act of pointing has some interesting implications for theory of mind, which is the ability to understand that others have beliefs, desires, etc. different from one’s own. Even if we interpret Lucy’s ‘what’ gesture as nothing more than a pointing action, it is still interesting and relevant from this perspective. Pointing is a means of directing another individual’s attention to something. It is reasonable to suggest, then, that
theory of mind would be a prerequisite for this behavior. In order to direct another’s attention to something that you are already attending to, you must first understand that their perspective is different than yours.

Temerlin explicitly specifies that, while he believes that Lucy can ask ‘what’ questions, she has never asked ‘why’ (Temerlin 1975, 123). Temerlin tried to prompt Lucy to ask questions of this type by performing magic tricks and other such displays requiring further explanation, but Lucy never inquired further despite what he described as clear fascination and mystification (123). While this of course could merely be indicative of a lack of causal reasoning, Temerlin interpreted the behavior as exemplary of her inability to ask ‘why?’. There are a limited number of scholarly publications on Lucy’s case, but it will serve as an important one for our purposes nonetheless. While each of these primates has unique and intriguing backgrounds, Lucy’s upbringing is especially so. Her somewhat ambiguous ‘what’-like pointing is also an interesting behavior to bear in mind as we construct our account of the initial emergence of human questioning in Chapter 3.

Lana

Lana is a female common chimpanzee, formerly a research subject at Emory University beginning in 1973. She was the first non-human to learn a lexigram language (Rumbaugh 89). Ernst von Glaserfeld, one of the principal investigators for the Lana Project, coined the term ‘lexigram’ to denote a symbol which represents a word but does not necessarily bear any resemblance to its corresponding object or
idea. For the Lana Project, he designed a language of 120 lexigrams and a grammar to regulate their usage, naming this artificial language Yerkish (89). Lana was trained to use a computerized lexigram board to interact with the computer program and (indirectly, through the program) her trainers in Yerkish (92).

The most interesting element of the Lana Project for our purposes is that Yerkish includes a ‘?’ symbol, used to denote the interrogative mood (Rumbaugh 1977, 115). In their extensive reports, Lana’s investigators recount numerous cases of her using this symbol in interactions with her trainers (173). At a glance, then, it appears that perhaps Lana has indeed managed to ask some questions. After all, she has reportedly used the interrogative ‘?’ symbol according to the grammatical rules of Yerkish in interaction with a human. Upon further investigation, however, it becomes clear that Lana’s behavior may be nominally but not functionally interrogative.

In addition to the interrogative ‘?’ symbol, there is a Yerkish symbol resembling an arrow, which translates to ‘please’ in English, used to denote the imperative mood (Rumbaugh 1977, 115). The Lana Project computer program, interestingly, treats these two symbols (‘?’ and ‘please’) as functionally equivalent (171). Lana eventually seemed to realize the inherent redundancy of these two symbols and opted to use the ‘?’ symbol alone for making requests, rather than ‘please’ or both symbols together (171). Additionally, of the ‘?’ uses recorded by Lana’s investigators I encountered, all of them involve a request (173). Together, these facts indicate that while the ‘?’ symbol is called interrogative, and is likely employed interrogatively by its human users, there is no evidence to suggest that
Lana’s use of this symbol constitutes questioning behavior. Once again, we see the use of an interrogative illocutionary force-indicator device (although in this case, there may even be an argument against ‘?’ being interrogative because it is computationally equivalent to ‘please’) being used to perform an illocutionary act other than a Question (namely, a Request).

**Nim Chimpsky**

Nim Chimpsky, named for linguist Noam Chomsky who believed that humans are uniquely predisposed to develop language, was a male common chimpanzee studied at Columbia University in the 1970s. Project Nim was conceived partially as a challenge to Chomsky’s theory that only humans have the capacity for language. Nim was taught ASL using similar techniques as those used by the Gardners with Washoe (Terrace *et. al* 1979, 891). He was raised by surrogate human parents in a home environment with numerous human teachers (891). By September 1977, Nim had learned 125 signs, used spontaneously and consistently in contextually appropriate ways (892). Nim also spontaneously combined signs (892), creating combinations as long as 16 signs (895).

Unlike with Washoe and Sarah, questioning was not specifically named among the goals of Project Nim. Additionally, question asking was addressed nowhere in the reports of Nim’s accomplishments. Nim’s researchers performed extensive analyses on the sign order in Nim’s combinations, trying to determine what grammatical structure, if any, was at play (Terrace *et. al* 1979, 893). The Question of
Questioning did not come up in the process of these analyses either. Given the extensive reporting/analysis and strong interest in grammatical forms on the part of Nim’s researchers, it is highly unlikely that a question asked by Nim would have gone unreported. Thus, we can conclude with relative confidence that Nim never asked a question.

Nim’s research team—principal investigator Herbert Terrace in particular—made a point to encourage skepticism in regard to primate ‘language’, suggesting that while it is clear from Washoe, Sarah, Lana, and Nim that primates can learn to appropriately use an impressive vocabulary of signs or lexigrams, there is no evidence to suggest that they are doing so for any reason other than to receive a reward (Terrace et. al 1979, 900). Terrace reached this conclusion partially through extensive analysis of the sign order used in Nim and Washoe’s combination phrases. Terrace argues that at this point (1979), one cannot be confident that ape language seeks to convey information or communicate (900). Terrace’s position on this point makes me even more confident that Nim never asked a question, as this event would have constituted a communicative behavior aimed at initiating information transmission (exactly what he claimed linguistically trained primates were not doing). I, for the moment, remain agnostic regarding the general communicative intent of linguistically enabled non-human primates like Nim. Focusing on the task at hand, however, let us conclude that despite a substantial vocabulary and inclination to combine signs, Nim did not appear to ask any questions.
Koko

“Koko”, short for Hanabiko, is a female western lowland gorilla who has been cared for and taught sign language by animal psychologist Francine Patterson since 1972 (Gorilla Foundation n.d.a). According to Patterson, Koko is able to understand over 1,000 signs in a modified version of ASL (which Patterson calls “GSL”, or Gorilla Sign Language) and 2,000 spoken English words (Gorilla Foundation n.d.a). Patterson has reported Koko concatenating her existing vocabulary to create novel signs, forming coherent phrases as long as 8 signs, and even employing a consistent grammar (the details of which appear yet unspecified) (Gorilla Foundation n.d.b). Koko gained some notoriety from videos of her signing “bad, sad bad” in reaction to the news that her pet kitten had died (Gorilla Foundation n.d.b). If her signing was indeed correctly interpreted, than this video is not only emotionally resonant but also empirically significant. It indicates that Koko is capable of expressing herself emotionally through sign language and also that she is capable of displaced reference.

It is important to note, however, that Patterson’s findings are frequently disputed. While Koko’s achievements are documented on a devoted website as well as frequently covered by popular media, Patterson’s scholarly publications containing concrete data have been limited. Some contest that Patterson may be (perhaps unknowingly) prompting Koko in subtle ways or overinterpreting her signing (Petitto and Seidenberg 1979)(Miles 1983)(Terrace 1983)(Sanders 1985). Patterson maintains that her success in teaching and interacting with Koko is rooted in their close bond and her willingness to “listen to the gorillas and discern their meanings” (Gorilla
Still, it is important to remember that a significant portion of Patterson’s reports are made without reference to concrete supporting evidence.

In reviewing Patterson’s website, interviews, and scholarly publications, I have identified two instances where she reported Koko having asked a question. The first is a report on her website denoting an interaction between Koko and a volunteer in which the woman was “asked an impromptu question by Koko” (Gorilla Foundation 2005). This statement caught my attention immediately, of course, but upon further investigation proved unremarkable. The ‘question’ Koko had asked was: “you, woman, hat” (Gorilla Foundation 2005). The volunteer interpreted this collection of signs as Koko recalling that she (the volunteer) had worn a hat the previous week and asking for confirmation of this fact. While it is certainly possible that this was Koko’s intention, it seems that this case may be one of overinterpretation. There does not appear to be any content in Koko’s signing to indicate that she meant it as a question rather than a statement.

The second instance where Koko reportedly asked a question appears in an interview with Patterson wherein she recalls Koko’s dismay upon learning of Robin Williams’ passing. According to Patterson, she was with Koko when the news about Williams began to circulate. Koko “knew that something was wrong. She asked me [Patterson] to tell her what it was. So I did” (Morin 2015). I could not locate any footage of this incident, nor any further description of what signs constituted Koko’s “ask[ing] me to her tell her what it was” (Morin 2015). Given these circumstances, I will label this incident inconclusive at best. I suspect that this case is yet another that
speaks more to human interpretation than it does to gorilla intent, but without video or transcription of her signing it is impossible to know. Given Patterson’s readiness to recount Koko’s unique linguistic and cognitive achievements, I am inclined to suspect that if she had any substantive example of Koko asking a question, she would have documented it and claimed that accomplishment explicitly.

Koko’s case is more difficult to discern than others among the cohort of linguistically enabled non-human primates. This difficulty arises largely from Patterson’s non-traditional approach to documenting and reporting Koko’s behaviors, as well the challenges raised regarding her interpretive method. It impossible to determine definitively from Patterson’s reports whether or not Koko asked a question. That said, if Patterson’s passing claim in recounting the Robin Williams anecdote is indeed our strongest indication, then I would venture that there is as of yet no compelling evidence for a question asked by Koko.

**Kanzi & Panbanisha**

Kanzi is a male bonobo (or pygmy chimpanzee) known for his exceptional linguistic aptitude. His is a particularly compelling case because he began his language learning as an apparently self-motivated pursuit, without direct teaching (Savage-Rumbaugh and Lewin 1994, p.x). He was first exposed to language training as an infant, when he would accompany his adopted mother Matata to her lexigram keyboard sessions (129). When Kanzi was around 18 months old, Matata was transferred to another facility, leaving Kanzi behind (134). The researchers decided
that Kanzi’s linguistic training should begin immediately following her departure. To
their surprise however, when they put Kanzi in the presence of the lexigram board to
begin familiarizing him with it, he immediately started using the board correctly
(135). Kanzi thus became the first non-human primate to have acquired linguistic
skills naturalistically, that is without direct instruction (135). Following this incident,
researchers began instructing Kanzi directly, finding that he was able to quickly
master lexigrams that his mother had failed to learn (135).

When Matata gave birth to Kanzi’s sister, named Panbanisha, Kanzi already
knew a significant number of lexigrams. Panbanisha was therefore trained separately,
along with a common chimpanzee, with the goal of comparing bonobo and common
chimp linguistic aptitude (Savage-Rumbaugh and Lewin 1994, 177). The two were
allowed to converse with each other using lexigrams, though Panbanisha showed
significantly greater linguistic ability than her common chimp training partner (177).
After several years, her partner was removed from the study and Panbanisha was
observed alongside Kanzi instead. The two learned and worked together until
Panbanisha’s early death from a respiratory infection in 2012 (Toth and Schick n.d.).

Both Kanzi and Panbanisha have gained notoriety for their impressive
vocabularies and cognitive abilities. At the time of her death, Panbanisha had a
vocabulary of over 200 symbols (BBC n.d.). She began using lexigrams at a younger
age than Kanzi, approximately 12 months (Savage-Rumbaugh and Lewin 1994, 177).
She also appeared to use displaced reference (258) and play pretend (277). According
to Dr. Sue Savage-Rumbaugh, Kanzi and Panbanisha’s principal investigator, Kanzi
knows and uses more than 348 symbols (Raffaele 2006). In addition to an impressive vocabulary of lexigrams, Kanzi can understand a significant amount of spoken English (Savage-Rumbaugh and Lewin 1994, 150), Savage-Rumbaugh estimates upwards of 3,000 words (Raffaele 2006). Kanzi famously picked up a number of ASL signs, once again to the surprise of his researchers, simply from watching videos of Koko signing (Prince-Hughes 135). Kanzi has also displayed numerous non-linguistic indicators of cognitive sophistication, including advanced tool construction and use (Savage-Rumbaugh and Lewin 1994, 201-222), cooking (“Kanzi - An Ape of Genius - Part 1.” 2010), making fires (Barcroft TV 2012), and even mastering the arcade game Pac-Man (Orioni 2006).

If ever there were likely candidates for a cognitive-linguistic breakthrough such as question-asking, it would seem to be Kanzi and Panbanisha. As with previous cases, Kanzi and Panbanisha were frequently asked questions by their trainers (Savage-Rumbaugh and Lewin 1994, 43) and would make demands of the humans around them (145). Following a thorough review of reports both scholarly and in popular media, however, I have found no reference to any question being asked by either bonobo.

**Chantek**

Chantek was a male hybrid Sumatran/Bornean orangutan who learned a modified ASL at the University of Tennessee at Chattanooga (Miles 1990). Chantek was initially taught new signs through hand molding but later progressed to imitation
(Miles 1990, 513). Though Chantek mostly signed with his hands, as he was taught, he would also occasionally sign with his feet (530). His researchers interpret this behavior as evidence that he had a more abstract mental representation of the sign image beyond the exact behavior that was originally taught (530).

Chantek learned more than 140 signs and also invented some signs of his own (Miles 1990, 511). Though the first signs he mastered were related to food (514), once his vocabulary grew only 22.7% of his signing was aimed at food acquisition (516). Chantek combined signs, using descriptive attributes such as “red bird” or “white cheese” (525). He also used signs to refer to things not present, otherwise known as displaced reference (528). As much as 38% of Chantek’s signing at age 8 involved displaced reference (528). Chantek would use signs deceptively about three times per week, perhaps suggesting an understanding that the signs communicated information to other minds with different knowledge sets from his own (529).

This finding has been used as evidence for non-human primate theory of mind. The aim of any deception is to instill another individual with a false belief. In order for such an aim to be intelligible, the deceiver must understand that the individual being deceived has their own beliefs and desires. Theory of mind is relevant to our project here in two ways. First, it is among the many cognitively complex traits displayed by non-human primates that render their lack of questioning ability surprising. Second, the fact that other primates appear to have theory of mind will be used in constructing some of the evolutionary accounts to be explored later.
Chantek’s researchers administered a wide variety of linguistic and cognitive tests throughout the orangutan’s lifetime (Miles 1990, 532). There is no reference, however, to any explicit attempt to prompt the use of an interrogative, nor is there any documentation of a question spontaneously asked by Chantek. This absence is unsurprising given that in looking through Chantek’s documented vocabulary, I not only found no interrogative sign, but also discovered that most of his signs were objects, names, and action verbs (517). Despite disrupting previous underestimations of orangutan intelligence (512) and mastering many signs (517) as well as a collection of other cognitively sophisticated behaviors (531-2), Chantek appears to have never asked a question.

**Question Development in Human Children**

In our review of the most influential and successful non-human primate language studies, we have, I hope, robustly established the merit of my first postulate. We will now turn our attention to the second postulate, which concerns whether or not it is actually surprising that non-human primates do not ask questions. As outlined above, this second claim is as important as the first because it grounds the Question of Questioning as something that is indeed in need of explanation. With this in mind, we will now examine human developmental research alongside the findings of these non-human primate language studies to determine whether the lack of non-human primate questioning is indeed an anomaly.

Human infants are considered capable of asking questions from when they first begin to speak (Chouinard 2007, 16). Often, this metric means that children are
asking questions as early as 12-18 months (Casillas and Hilbrink n.d.). In fact, one article aimed at parent education states that if a child does not ask questions by 25 months, it may be a sign of language delay or hearing problems (BabyCenter 2016). Question asking peaks around 4 years (Child Care Resource Center n.d.) (RQI n.d.), and seems to serve a number of important developmental purposes.

The developmental function and significance of question asking is a topic that we will examine in greater depth later in this essay (especially in Chapter 5). To begin with, however, let us simply note that a number of developmental psychology studies have found that early question asking—as early as 14 months in one study—functions as a means of acquiring information (Chouinard 2007). Deeming questioning an “Information Requesting Mechanism”, or IRM, these studies have assessed the content and context of early questions to determine that their aim and outcome is information acquisition rather than simple attention seeking behavior (Chouinard 2007). There is much more to be said about the developmental function of question asking, but as much of it remains speculative, I will leave these discussions for a later chapter. For now, the important findings to bear in mind are as follows: 1) children begin asking questions early in development (~12-25 months), 2) children ask a lot of questions (particularly around 3-4 years), and 3) research suggests that these questions serve as genuine information-acquisition devices, even in early stages of development.

It may be useful at this stage to examine some of the other linguistic accomplishments of our non-human primate subjects as they relate to human
development. I will compare the average age at which various linguistic acts (displayed by at least one of our non-human primate subjects) emerge in human children with the previously discussed age range for question asking. While developmental benchmarks can be dubious when used to evaluate the development of a single child (as there is a lot variation concealed by the average), they are useful in projects such as this one that seek to analyze general trends. While there is no reason to assume on any general level that non-human primates would develop in the same way as humans, it is a useful mode of analysis for language development specifically. Because subsequent phases of linguistic development tend to build upon skills acquired in previous phases, it is reasonable to expect many linguistic capacities to emerge in a similar order of increasing sophistication, regardless of the speaker’s species.

While I outlined many impressive linguistic accomplishments in my initial review in order to underscore the particular successes of each study, I will here focus on those accomplishments which can be easily compared with their development in human children: sentence formation, answering yes/no questions, displaced reference, deception, and vocabulary size.

Human children begin forming two-word sequences from around 18 months of age (Casillas and Hilbrink n.d.). However, longer sentences do not generally appear before 30-36 months (Casillas and Hilbrink n.d.). Given that a lack of questioning is considered concerning around 25 months, sentence formation seems to fall after questioning in the typical human developmental sequence. As outlined
previously, many of the non-human primate subjects formed word combinations and short sentences, with Washoe and Nim both forming longer sentences of up to 16 words (Gardner and Garner 1969, 670) (Terrace et. al 1979, 895).

A number of primate subjects could consistently respond accurately to yes/no questions, Sarah being one example (Premack and Premack 1983, 96). Children aged 2-3 years display a strong “yes-bias”, which undermines their ability to accurately respond to yes/no questions (Fritzley and Lee 2003). It is not until age 4-5 year that this bias towards answering “yes” dissipates and children answer yes/no questions accurately (Fritzley and Lee 2003). Once again, we see a primate subject displaying a linguistic behavior that typically emerges later in human children than question asking does.

Displaced reference, that is linguistically referring to something not currently present, emerges in human children around 18 months (Morford and Goldin-Meadow 1997, 422). Both Chantek and Koko were documented displaying displaced reference (Miles 1990, 528) (Gorilla Foundation n.d.b). While 18 months is not strictly beyond the bounds for question asking to emerge in human children, it certainly places these non-human subjects within an appropriate developmental range for questioning.

Deception was a behavior displayed consistently by Chantek (Miles 1990, 529). Interestingly, such behavior does not appear in human children until around age 4 (Ruffman et. al 1993). Clearly, this constitutes another case of a non-human primate displaying linguistic behavior that generally emerges significantly later than question asking in human development.
Finally, we are left with the issue of vocabulary size. The average child does not typically reach a spoken repertoire of 200 words until 23 months of age (PBS n.d.). While there was a large range amongst our non-human primate sample (and I feel I must exclude Koko’s 1000+ vocabulary estimates due to a lack of thorough documentation), the average vocabulary size of the subjects reviewed here was over 200 even by the most conservative estimates. Washoe and Kanzi had vocabularies approaching 400+ words (Gardner and Garner 1969)(Raffaele 2006). Thus, many non-human primate subjects seem to be beyond the vocabulary size at which one would expect question asking to have already emerged in a human child.

There are a handful of studies that directly compare human children and chimpanzees on the subject of question answering. One 1975 study conducted with Washoe as the non-human primate subject compared Washoe’s replies to “Wh-” questions to those of human children ages 1.9 to 2.5 years of age (Gardner and Gardner 1975). The study found that Washoe’s answers were more appropriate than the children's on average, in terms of providing approach sentence constituents (Gardner and Gardner 1975). While this study does not address question asking on the part of the children or Washoe, it does indicate that Washoe had a strong, perhaps superior in some ways to children aged ~2 years, understanding of question forms. This finding makes it all the more surprising that young children are often able to pose questions where Washoe and other linguistically non-human primates cannot.

While such a conclusion could not be built upon any one of these comparisons, it becomes increasingly evident from the body of research that, at the
very least, question asking appears to be within a linguistic developmental phase that has been reached by numerous non-human primates. A more bold assessment could argue that some linguistic achievements by non-human primates indicate that certain among them have advanced beyond this phase, leaving question-asking as an unexplained gap in their developmental trajectories.

**Conclusion**

It was not my intention, in this chapter, to claim definitively that non-human primates cannot ask questions; nor was it to speculate as to why they might not do so. Rather, I set out to demonstrate that as of yet, non-human primates have not asked any questions. As we saw in our review of non-human primate language literature’s most notable studies, there are a handful of instances where it seemed a subject was close to asking a question. Thus far, however, there appears to be no well-documented instance of a linguistic act that is clearly a question according to the definition generated in Chapter 1.

In the second section of this chapter, we performed a brief comparison between various facets of linguistic development in human children and non-human primate subjects. We found, on various points, that the non-human primate subjects appeared to be performing other linguistic behaviors that typically develop later than question asking in human children. This comparison begs the question: why can non-human primates perform these more sophisticated behaviors but not ask questions? There appears to be something different or special about questioning as
compared to certain other linguistic acts. Here, we have at last arrived at the Question of Questioning, which I will spend the remainder of this essay considering in light of various naturalistic accounts of human cognition.
Stage 1: What?

Having posed the Question of Questioning in the previous chapters, I will now attempt to answer it. I will do so by charting a three-stage evolutionary theory that accounts for the emergence of questioning in early humans. If my theory is convincing, then it will have addressed the Question of Questioning in both its phrasings. It will address the “why do humans ask questions?” formation of the problem head on. While one could theoretically approach this issue from a number of disciplinary perspectives, I have chosen to construct my argument as an evolutionary account because it presents an opportunity for explanation that is simultaneously scientifically and philosophically robust. These stages will also, by extension, address an alternate formulation of Question of Questioning: “why don’t non-human primates ask questions?” The answer implied by this account is that non-human primates do not ask questions because they all diverged from hominids before the key evolutionary transitions that brought about questioning took place.

I will begin constructing my theory of questioning by explicating its first evolutionary stage in this chapter. This first stage will center around the emergence of the original question type: factual questions. This type of question is encapsulated, but not restricted to, the interrogative word ‘what’. My account will incorporate the work of developmental psychologist Michael Tomasello, primarily in this stage but
also in the subsequent two stages. I will be drawing upon his empirical research with
children and non-human primates as well as his evolutionary-philosophical theory
presenting collaboration as the magic bullet for human cognitive evolution. I will
begin this chapter by conducting a thorough explication of Tomasello’s account, as
presented in his 2014 book *A Natural History of Human Thinking*. My presentation of
Tomasello’s work will be significantly more in-depth than those of Kim Sterelny or
Joseph Rouse (to be incorporated in subsequent chapters), a move justified by its
overarching relevance to my theory. In order for the reader to understand my account,
it is essential that they first understand Tomasello’s stages of “intentionality” (more
on Tomasello’s use of this term to come) and other accompanying evolutionary
transitions. Because the three stages of my theory are oriented in relation to
Tomasello’s stages, though they do not align exactly, a thorough review of
Tomasello’s work is invaluable to a cogent presentation of my ideas. I will be
presenting his account, as reflected in *A Natural History of Human Thinking*, as
completely as possible—meaning that it may include points that I will take issue with
later in the essay. Nevertheless, it is important to introduce Tomasello’s work first in
its original form, so that revisions to it later in this essay will be well contextualized.

Tomasello is interested in formulating an naturalistic account of human
cognition based on contemporary evolutionary biology, developmental psychology,
and primate behavioral research. He distinguishes between two types of cognitive
processes by which animals solve problems and make decisions: “intuitive heuristics”
(system 1 processes) and “thinking” (system 2 processes) (Tomasello 2014, 4). While
a great many species of non-human animals possess some type of system 1 cognition, system 2 is only found in humans and a select few other animals (4). Tomasello chooses to focus on this second system, breaking it down further into three constitutive components. Thinking, claims Tomasello, involves: a) offline cognitive representation, b) causal, intentional, and logical inferences which serve to transform the previously mentioned offline representations, and c) the capacity for self-monitoring of some kind (4).

Tomasello understands certain aspects of human cognition, including thinking, to be deeply rooted in our collaborative sociality (Tomasello 2014, 1). Human thinking, claims Tomasello, is enabled by a particular kind of “sociocultural matrix” (1). *A Natural History of Human Thinking* sets out to provide an evolutionary account of how such matrices, and the unique forms of thought they facilitate, may have arisen. The full blown human thought that Tomasello has in mind can be summarized in terms of the three components of thinking outlined above as “objective-reflexive-normative thinking” (4). Tomasello charts an increasingly collaborative trajectory in the history of each of these components, arising from conditions that rewarded cooperative and collaborative behavior. It is important to note that he is not claiming that modern humans are genetically hardwired to think in this particular objective-reflexive-normative way (6). Rather, humans are predisposed toward sophisticated collaboration and communication (6). It is through exercising this innate potential for collaboration that children develop the kinds of highly social
and uniquely human representation, inference, and self-monitoring that Tomasello specifies (6).

Tomasello contrasts his approach with two bodies of previous work on human thinking. First, he distinguishes himself from past thinkers, from Piaget to Wittgenstein, who theorized about how human sociality and cognition relate to each other (Tomasello 2014, 2). He finds these accounts lacking, and attributes their limited success to the fact that they were working without certain more recent empirical and theoretical findings. Tomasello sets himself apart here by emphasizing that his work draws heavily upon recent work in a number of scientific disciplines (2). Second, he points out the short fallings of strictly behaviorist and ethological evolutionary accounts (7). He claims that such accounts focus only on the heuristic (system 1) processes of cognition and ignore thinking entirely in doing so (7). Tomasello’s approach can perhaps be best understood as an effort to address the question of human thinking from some middle ground that is empirically driven but also preserves the possibility for conceptual thought that behaviorism cannot accommodate.

At the center of Tomasello’s account are three evolutionary stages, each characterized by an increasingly collaborative “intentionality”. Together, these stages form the argument for his “shared intentionality hypothesis.” For each stage, Tomasello presents key transitions with respect to environment, communication, and cognition. Although Tomasello surely does not intend to assert that these transitions happened separately one after the other, he generally understands environmental
change to give rise to behavioral (communicative) change, which in turn gives rise to
cognitive change. That said, even though Tomasello chooses to consider them
individually, all three of these types of transition should be understood as occurring in
concert and influencing each other in an ongoing way. While Tomasello does not
often specify exactly the relation he intends between these different facets of
organism-environment (the interconnected way of life that encompasses both the
organism and its environment, to be discussed further in Chapter 5), it is reasonable to
assume based on his treatment of them that these domains are all changing in an
ongoing and mutually-reliant manner.

**Individual Intentionality**

Tomasello begins with a discussion of the simplest, and least collaborative,
form of thinking: what he calls ‘individual intentionality’. Individual intentionality, as
Tomasello describes it, is a mental state within an organism that relates to its external
environment. The organism integrates a goal (e.g. the fulfillment of a desire) with a
mentally represented epistemic connection to the world (e.g. a belief) to produce an
intention to carry out a certain action (Tomasello 2014, 9). Individual intentionality
will serve as the starting point for Tomasello’s evolutionary stage theory because it
predates human evolutionary divergence. Tomasello argues (outlined in more detail
below) that the behaviors of non-human primates indicate that they, and by extension
probably the last common ancestor humans shared with them, have individual
intentionality. Through his characterization of individual intentionality, Tomasello
presents the basic form of thinking upon which his later stages—which are applicable
only to humans—will build.

At the individual intentionality stage, Tomasello’s three components of
thinking—representation, inference, and self-monitoring—have a notably pragmatic
orientation. Cognitive representation at this stage takes the form of selective
environmental salience. That is, the organism attends more closely to those aspects of
its environment that are more relevant to its goals (Tomasello 2014, 12). Some
examples of such heightened relevance might include food sources (relevant to the
organism’s goal of feeding itself) or predators (relevant to the organism’s goal of
avoiding attack). The assessments of relevance implied by this model are based at
least partially on previous experience, and as such necessarily involve some sort of
categorization of current elements of experience with previous ones (i.e. “this is one
of those”) (12). Cognitive representation, then, also involves the application of
abstract concepts to the organism’s current situation.

Inference, in individual intentionality, involves the manipulation of cognitive
representations to play out hypotheticals (Tomasello 2014, 13). The organism
imagines potential outcomes of its behavior, as well as potential causal/intentional
impacts from outside forces. It then interprets these potential outcomes in terms of its
goals (13). These types of inferences will be used by the organism to determine the
best course of action in a given situation.

The final component of individual intentionality is behavioral self-monitoring.
After performing an action, the organism observes the outcome of its action and
assesses that outcome in terms of its goals (Tomasello 2014, 14). The organism learns from experience over time by using these behavior-outcome associations to more accurately predict such causal relations in the future (14). The result is an ongoing process of behavioral self-regulation based on experiential learning.

Having described individual intentionality, consisting of the three components outlined above, Tomasello examines non-human great ape behavior in these terms. He is interested in other great apes primarily because they are our closest living relatives and consequently may offer a window into the characteristics of our last common ancestor (Tomasello 2014, 15). For this reason, he is especially interested in common chimpanzees and bonobos, as their evolution diverged from humans’ most recently. In cases where other apes behave similarly to humans, one can assume that the cognitive underpinnings of this behavior were established at or before the time of evolutionary divergence (15). Tomasello outlines a wide array of non-human great ape research in an effort to paint a picture of their cognition. Ultimately, he seeks to argue that, based on the threefold model for individual intentionality he has already established, non-human great apes can think.

First, Tomasello attempts to characterize non-human great ape cognitive representation. He proposes, based on a number of non-human primate behavioral studies, that their cognitive representations are imagistic, schematic, and involve situational content (Tomasello 2014, 27). That is, their representations are based on perceptual experience, involve generalized schematizations based on exemplar situations, and center around situations relevant to the individual’s goals (27-28).
Second, Tomasello demonstrates the ways in which non-human great apes apply the above representational forms to imagine not-yet-realized situations. This great ape inferential reasoning possesses two key traits: logic and productivity. Logical inference, in this context, is based on the organism’s generalized notions of causality: they are an application of cause-and-effect relations in the physical and social worlds (28). Productive inference concerns the imagining of nonactual situations (28).

Finally, Tomasello asserts that non-human great apes perform not only behavioral self-monitoring but also cognitive self-monitoring. For great apes, this type of self-monitoring is simply the individual’s awareness of whether or not they have enough information to make an informed behavioral choice (30). This ability is key to the decision-making process.

Together, cognitive representation, causal/intentional interference, and behavioral/cognitive self-monitoring are the vital components of great ape thinking. Tomasello concludes that great apes do indeed think, in light of these components and his previous definition of thinking. Based on the assumption that characteristics shared by all great apes (including humans) were likely present in our last common ancestor, we can conclude that this ancestor was capable of a kind of rudimentary thinking. Tomasello dubs this basic form of thought individual intentionality.

Individual intentionality, says Tomasello, is best suited to a sociality that is primarily competitive (Tomasello 2014, 31). Non-human great apes operate primarily under such conditions, and based on this finding, we can assume that our last common ancestor with all other great apes did as well (31). This vision of a creature
with the basic cognitive capacities necessary for thinking living in a competitive social environment provides the starting point for Tomasello’s stage theory. This theory will use feedback relations between cognition and social behavior to imagine how uniquely human ways of thinking may have emerged.

**Joint Intentionality**

The first cognitive transformation in Tomasello’s account is from individual intentionality, described above, to what he calls ‘joint intentionality’. Paleoanthropological evidence indicates that by around 400,000 years ago, hominids were engaging in collaborative, systematic large game hunting (Tomasello 2014, 36). Tomasello hypothesizes that around 2 million years ago, soon after the genus *Homo* first emerged, human behavior took what he calls “a cooperative turn” (36). These early humans inhabited a unique evolutionary scenario which, in combination with the fundamental cognitive features of thinking outlined above, gave rise to a new and more collaborative way of life.

Tomasello attributes the rise of more collaborative behavior in these early humans to the two related processes of interdependence and social selection (Tomasello 2014, 37). Interdependence refers to the mutual reliance of these early humans on each other due to their inability to procure food on their own (37). Individuals relied not only on their own skills but also on the foraging activities of others to secure their daily sustenance (37). This inter-reliant dynamic created swift selective pressure for traits enabling and enhancing joint action. The social selection
process results from interdependence in the following way: the choice of a better cooperative partner will result in more effective foraging, more food, and thus a better chance of survival (37). A second social selective pressure thus arises concerning the increasingly advantageous abilities to: a) discern who is an ideal cooperative partner and b) consider how others are evaluating your cooperative aptitude (37). These novel considerations gave rise to new forms of social thought in which two individuals practice joint attention in service of joint goals (38).

The formation of a joint goal requires not only that both parties have the same objective but also that the achievement of the objective involves cooperating with the other party and that they are mutually aware of each other’s shared goal (Tomasello 2014, 38). Joint goals are thus distinguished from parallel goals, which may be the same but imply competitive or independent pursuit (39). A joint goal does not usually imply identical behavior. Rather, a division of labor results in individual roles for each party (40). The cooperators act as individuals, but do so with an awareness of how their behavior, in conjunction with that of their cooperative partner, serves their joint goal.

As two parties act cooperatively in pursuit of a joint goal, they naturally coordinate their attention (Tomasello 2014, 43). Individuals attend to those aspects of their environment that are relevant to their goals. As such, a joint goal will result in joint attention (44). While each party maintains an individual perspective, they are each aware of the other’s perspective. The result is two individuals attending to the same thing from two different perspectives (44). Effective cooperation within this
 schema is thus facilitated by the ability to understand different perspectives (45). A so-called ‘common ground’ consisting of joint goals and attention is formed. This common ground enables and motivates cooperative action.

Joint goals and joint attention, arising with collaborative foraging behavior, led to new forms of communication. Tomasello believes that the first of these collaborative communicative forms were pointing and pantomime (Tomasello 2014, 49). Such “natural gestures”, in this context, were methods for informing a cooperative partner of circumstances immediately relevant to them (49). Recall from the previous chapter that pointing has even been observed in captive non-human primates (Leavens, Hopkins, and Bard 2005), suggesting perhaps some predisposition towards this communicative tool even prior to its application in collaborative foraging. Through the use of these new communicative forms came new cognitive forms. The components of thinking explored in the previous section take on a newly social character, forming what Tomasello calls “second-personal thinking” (68). Second-personal thinking consists of perspectival, symbolic representations, socially recursive inferences, and second-personal self-monitoring.

The use of communicative gestures like pantomime and pointing bring about a new kind of “triangulated” representation (Tomasello 2014, 69). In order to use such gestures, the communicator must imagine the situation simultaneously from her own perspective and from the perspective of the recipient of the gesture (70). Likewise, in order to accurately interpret a gesture, the recipient must imagine the communicator’s understanding of her (the recipient’s) perspective (70). In this way, the ongoing use of
such communicative gestures gives rise to newly perspectival forms of representation. Additionally, pantomime introduces a new element of symbolism to cognitive representation in early humans. The communicator performs a gesture meant to resemble its referent, and the receiver must use this resemblance to infer the communicator’s meaning (70). Unlike pointing, this mode of communication requires some categorical classification (71). Depending on the so-called “categorical perspective” assumed, the same object could be pantomimed as “food” or “monkey”, whereas there would be only one way to point at the object (70-71). Thus with pantomime emerges a primitive symbolism based on early humans’ budding ability to adopt multiple categorical perspectives for the same object.

Socially recursive inference arises in much the same way as perspectival representation. The interpretation of these representations requires each communicative participant to mentally stimulate what the other is thinking about their thinking (Tomasello 2014, 72). Both parties make inferences not only about the gestures themselves but also about the inferences their communicative partner is making (73). Inference thus becomes socially recursive: you make inferences about my inference about your inference, and so on. The combination of gestures also has a profound effect on early human inference. Through novel combinations of previously understood gestures, a recipient can be pushed to imagine new or even counterfactual situations (74). The recipient can use previously established schemas to imagine impossible situations by organizing combined gestures into familiar abstract “slots”
Inference is thus expanded beyond the familiar into the unknown and even the impossible.

Finally, Tomasello ends by specifying two manifestations of what he calls second-personal self-monitoring. The first manifestation concerns the fact that if early humans are reliant upon collaborative foraging, then every such human is subject to judgement on their cooperative potential regardless of social status (Tomasello 2014, 75). To be successful in a collaborative foraging niche, an early human must be able to effectively evaluate the propensity for cooperation in her peers (75). This way, she can choose to cooperate with a partner who is well suited to do so. Accordingly, an early human in this niche will benefit greatly from developing the ability to imagine or anticipate how a prospective partner will evaluate her collaborative potential (75). Once able to anticipate these judgements, the early human is able to adjust her behavior in order to maximize her collaborative potential in the eyes of another (75). In doing this, she optimizes her value as a partner and positions herself to forage with other highly collaborative partners and thus to be more successful. Here we have the first manifestation: the early human monitors her behavior based on concern for how a cooperative partner will view her (75).

The second manifestation of second-personal self-monitoring is communicative. The newly developed forms of collaborative communication discussed above must be employed with certain considerations in mind if they are to be reliably effective. Namely, the communicator must be concerned with the recipient's comprehension of her communicative gesture (Tomasello 2014, 75). The
Communicator therefore imagines how well her gesture will be understood by the recipient and self-monitors to maximize this understanding (75). Note that at this phase, self-monitoring is based only upon two perspectives: one’s own perspective, and the perspective of one’s cooperative partner. In the next phase, we will see the locus of self-monitoring—as well representation and inference—expand to concern the shared perspective of an entire group of collaborators.

**Collective Intentionality**

The transition from joint to collective intentionality follows much the same format at the transition from individual to joint intentionality. It begins with a newly social form of behavior: for the individual-to-joint transition this was collaborative foraging but for the joint-to-collective transition, it will be the emergence of culture. As in the previous transition, these behaviors manifest in new forms of communication: for individual-to-joint this was pantomime and pointing, and in joint-to-collective we add to those inherited communicative conventions, complex representational formats, self-reflection, and the giving of reasons. These new behavioral and communicative ways of being are accompanied by new forms of thinking: for individual-to-joint these forms were perspectival representations, socially recursive inferences, and second-personal self-monitoring, and for joint-to-collective these forms are transformed to be even more broadly social. The result is what Tomasello calls objective-reflective-normative thinking. This term refers to the same three components he has discussed thus far: objective
representation, reflective inference, and normative self-monitoring. Here, at last, we have reached full blown human thinking.

The emergence of culture begins when collaborative foraging is destabilized by two related factors: competition with other humans and increased population size. Free pools of early humans cooperating in similar ways formed into loose social groups in order to protect themselves from invaders (Tomasello 2014, 82). These loose groups gradually fell under pressure to become organized collaborative groups for similar reasons (82). The shared goal of the group members was survival, not only of the individual but of the group as well (82). It thus became vitally important for an individual to be able to recognize members of her group as such (83). One important mechanism for this recognition, as well as optimizing strategies for survival, was collective cultural practices (85). Groups developed shared conventions, norms, and institutions that eventually transformed their thinking (84). Cultural practices are subject to a kind of “ratchet effect” whereby a given practice is followed until a preferred alternative emerges, at which point the new practice will be followed until further innovations arise (83). Cultural practices are enforced by group members, providing even more incentive for adherence (87).

Along with these behavioral transformations came newly conventionalized forms of communication. Because humans had organized themselves into groups that persist over time, it was possible to develop these linguistic conventions that, unlike previous forms of communication, require prior cultural knowledge to use effectively. Tomasello chooses to highlight four conventional communicative features: inherited
conceptualizations, complex representational formats, self-reflection, and the giving of reasons.

At this phase, as mentioned in the previous paragraph, certain gestures are dependent upon a common understanding between individuals. If a person does not abide by the common understanding of a gesture, they will not be understood and will be left out (Tomasello 2014, 95). Being in tune with this common understanding becomes increasingly important as representations become more abstract and humans are born into social structures with pre-existing referential systems (96). This is what Tomasello calls inherited conceptualizations. Complex representational formats begin to develop around this time as well. Such formats include the linking of concepts (99), the emergence of syntax (100), a new importance of tone, and further development of automatized communicative forms corresponding to abstract patterns of experience (104). Self-reflection emerges through communication when speakers are forced to explicitly outline their own thought process (106) or the relevant background assumptions to help the recipient understand what they wish to communicate (108). Tomasello’s final new communicative form involves the giving of reasons, specifically in the realm of shared decision making. There are situations where blind trust in one’s collaborators is not sufficient and reasoning is thus necessary to identify the best course of action. Individuals participate in a decision-making process wherein arguments take place according to the group’s social norms (111).
With and from these conventional communicative elements arises what Tomasello calls “Agent-Neutral Thinking” (Tomasello 2014, 113). The three components of thinking—representation, inference, and self-monitoring—have become increasingly collaborative to the point where they ought now to be applicable to anyone and everyone sharing the same cultural common ground (113). Representation takes on what Tomasello characterizes as an “objective” character. By this, he means that certain concepts (e.g. marriage, money) are not repeatedly invented but rather passed down so extensively that they come to be understood as actual facts about the world (115). This differs from the triangulated representation of joint intentionality in its scope: the concept is not dependent upon the perspectives of two individuals but rather upon the cultural common ground of an entire collaborating group.

Inference takes on a newly reflective character, partially due to the types of norm-governed arguments outlined above. The pressure to succeed in these type of argumentative decision-making processes causes the development of an inner dialogue whereby the individual mentally plays out how various reasons/arguments would be received based on the group’s norms (Tomasello 2014, 113). The individual can now reflect on her own thinking.

Finally, normative self-monitoring arises from pressure to be understood and accepted by the group. The individual regulates her behavioral decisions based on her inferences about how they would be interpreted and judged based on the norms of her group (Tomasello 2014, 119). Her concerns in these regulatory impulses are twofold:
a) that her behavior is understood and b) that her behavior is acceptable (199). Both of these concerns can be addressed through monitoring herself such that her behavior is in keeping with group norms. Thus, self-monitoring, which began (with individual intentionality) as a process concerning only the individual’s knowledge is now informed by cultural knowledge created and reinforced by a collaborating group.

**Human Thinking as Cooperation**

Thus, through a stage theory of increasingly collaborative behaviors, communicative forms, and cognitive features, humans have developed objective-reflective-normative thinking. Tomasello goes on to note that although he does not fully endorse any of them, his account is not in direct conflict with any of the prevailing evolutionary theories about human cognition (Tomasello 2014, 133). Among these are theories of general intelligence (125), purpose narrow but domain general cognitive processes (e.g. language-focused models) (127), and evolutionary psychology “modules” (128). He highlights that there is also an ongoing stream of explicitly social evolutionary theory and recapitulates his own account in this context.

Tomasello distills his account to the following three central claims: 1) that intragroup competition led non-human primates to develop sophisticated sociality without the uniquely human forms of communication and collaboration (Tomasello 2014, 135), 2) that collaborative and cooperative activity and communication led to the development of new forms of human thinking before the emergence of culture or language (137), 3) that conventionalized cultural and language (driven by intergroup
competition) gave rise to all the remaining complexities of modern human thought (138), and 4) that cultural evolution produced a wide variety of culture-specific forms of thought (141).

Tomasello’s account is far from perfect. As we will see in our forthcoming discussion, he uses certain terms (including ‘objectivity’ and ‘intentionality’) in ways that I do not endorse. Additionally, his account has faced criticism as being unnecessarily anthropocentric (Tomasello 2018). Indeed, he often chooses language that presents the human evolutionary trajectory as somehow special or superior as compared to those of other primate species. Taking into consideration these limitations, I will be discerning in what pieces of Tomasello’s account I choose to incorporate into my own account. His production, consolidation, and analysis of empirical research (involving both non-human and human subjects) is excellent. Furthermore, the core of his three stages of intentionality is well-supported by this research and admirably explicated. That said, in order to use his model in my account, I will first have to review and amend his treatment of certain philosophical terms.

**Terminology**

Tomasello uses the term ‘objective’ in at least three ways in *A Natural History of Human Thinking*. At times, his use of the term seems to pick out a perspectiveless representation that gets beyond Gibsonian affordances—that is, those elements of the organism’s surrounds which have the most to offer and are thus most salient (Tomasello 2014, 122). At other points, it seems to refer to a normative representation
rooted in sociality (88). Finally, it sometimes seems to refer to an endpoint form of representation upon which any and all rational beings must converge (87).

Tomasello’s varying and ambiguous use of ‘objectivity’ creates a number of potential problems within his own account: most immediately, the reconciliation of disparate objectivities with such varying loci. The three objectivities outlined above each encompass different things: the individual organism, the collaborative group, and all rational beings, respectively. Given that Tomasello makes no move to acknowledge or reconcile these divergent uses, we are left only with their apparent incompatibility. Because of these issues, the vagueness of his usage, and the fact that thinkers consulted later in this paper will have need of the term, I will for now be setting objectivity aside as a consideration in the evolution of early humans. The remainder of this chapter will concern question asking only as it pertains to the transition from Tomasello’s individual to joint intentionality, not yet reaching his discussions of objectivity. We will return to the issue of objectivity in Chapter 5, where we will discuss normative questioning and the emergence of culture.

To that point, we will also be postponing a thorough discussion of normativity. Although Tomasello’s use of the term is less varied than with objectivity, it remains the case that other authors we will consider in later chapters use this term in a manner far removed from Tomasello’s usage. Tomasello uses normativity to describe social “rules” that facilitate cohesion, communication, and other forms of collaborative activity in groups of early humans. The problem, which will become more evident in our later discussion, is that Tomasello’s norms are too
static. Although he proposes that norms can change every so often, his general
discussion presents them as clear and stable edicts that must be followed by all
members of a group. As we will see in later chapters, this conception of normativity
is problematic because it fails to account for norms being constantly in question. The
notion of normativity we will want for our account is a two-dimensional (more on this
later) ongoing process of world articulation. As such, we shall be abandoning his use
of ‘normative’ along with his use of ‘objective’. This term, like ‘objective’, will
return in Chapter 5 with a discussion of the types of complexly collaborative
questions that arise with and after Tomasello’s collective intentionality.

A final—and arguably most important based on how frequently Tomasello
uses it—term in need of reconsideration here is ‘intentionality’. Tomasello’s use of
‘intentionality’ follows the legacy of John Searle in understanding intentionality as a
characteristic of mental states. Shared intentionality, then, occurs when a pair of
cooperating partners jointly direct their mental states. Intentionality poses an
interesting challenge in my project because, as with previously discussed terms,
Tomasello’s use of this term involves assumptions that are in direct conflict with the
view espoused later in my account. The primary point of discord here is the reliance
upon mental states that, like Tomasello’s norms, are problematically stable, fixed,
unchanging. In addition to the ‘state’ problem, the term ‘mental’ also carries some
troublesome implications: namely, the assertion of a mind that can be characterized
separately from the world. Essential to the latter parts of my account will be an
understanding of mind and world, organism and environment, as deeply
interconnected to the point that it is unintelligible to describe them in isolation. With these considerations in mind, I will now outline a reconception of intentionality, to be used for the remainder of this essay. While my forthcoming interpretation of Tomasello’s work is likely a departure from the intended reading, I do not believe it to be unreasonable or far-fetched given the claims he actually makes in *A Natural History of Human Thinking*.

Tomasello engages in what I consider to be an unnecessary prioritization of the evolution of newly collaborative intentional states (i.e. thinking). He rigorously outlines important phases of environmental and behavioral (i.e. communicative) evolution but presents them only as mechanisms for the evolution of shared intentionality. I will instead be understanding the evolution of increasingly collaborative forms of mental representation, inference, and self-monitoring as parts of an evolving integrated environmental-behavioral-cognitive way of life wherein these elements cannot be extracted from their interrelation to each other. Note that Tomasello already does excellent work developing the mutually-influencing components of this way of life. I simply wish to proceed taking the environmental, behavioral, and “intentional” elements of his evolutionary account as inseparable and of equal importance rather than parsing them out and framing some elements as secondary to others.

One straightforward example of why I am choosing to abandon Tomasello’s environmental vs. behavioral vs. mental distinctions is the case of self-monitoring. Let us take, for example, Tomasello’s most basic form of self-monitoring: the
behavioral/cognitive self-monitoring of individual intentionality. Behavioral self-monitoring concerns the carrying out of actions, observing their outcomes, and adjusting future behavior according to these outcomes. Cognitive self-monitoring concerns an individual assessing whether or not they have enough information to make an informed behavioral decision. It is evident, in both of these cases, that self-monitoring cannot be understood simply as a mental state—even one reaching out into the world. Both of these processes involve concrete behavioral practices that both inform and result from cognitive activity. Additionally, the environmental aspect of the self-monitoring situation cannot be set aside because it will inform behavioral practices as well as cognitive processes and it will be concretely impacted by the outcomes of the self-monitoring process. While it may be tempting to try to draw environmental-behavioral-mental divisions within the ongoing activity of self-monitoring, it is ultimately futile because the three form an integrated whole that is entirely involved in said activity.

For ease of reference and because I will not have much alternative use for the term, I will henceforth be using Tomasello’s intentional terminology to refer to the integrated organismic-environmental system described above. By this I mean that when I refer to the “individual intentionality” stage, I am referring not only to the types of representations, inferences, or self-monitoring that took place at that stage but also to the environmental and behavioral elements which are inherently inseparable from those so-called ‘components of thinking’. I will capitalize these terms (i.e. Individual Intentionality, Joint Intentionality, and Collective Intentionality)
to denote my specific and atypical use of them. The capitalized term ‘Intentionality’
refers specifically to a holistically interpreted way of life arising from Tomasello’s account.

**The Emergence of Factual Questioning**

Having established our treatment of some key terms, we may now turn to the Question of Questioning. We will begin by looking at the transition from Individual to Joint Intentionality as it relates the emergence of question asking. As specified above, I will be approaching this transition not as an environmental change leading to a behavioral change leading to a change in thinking, but rather as a feedback loop wherein all of these elements are changing with each other, capitalizing on an evolutionary niche (i.e. collaborative foraging by early humans).

There are elements of Tomasello’s account of Joint Intentionality that seem to be prerequisites to any kind of questioning, as we have defined it here. The necessary conditions for question asking must include: a) the understanding that another agent possesses information that you do not and b) the expectation that the other agent would provide a helpful answer if asked for this information. The first condition concerns theory of mind and the second concerns collaboration. Recall from the previous chapter that there is evidence suggesting that some non-human primates possess theory of mind, indicating that it may have been present in our last common ancestor. The collaborative way of life necessary to satisfy the second condition,
however, seems to be more relevant to human evolutionary history than to that of other primates.

I am not claiming that non-human primates do not engage in coordinated or even cooperative behavior. Indeed, chimpanzees engage in infrequent but evolutionarily stable coordinated hunting activity (Boesch 1994). Rather, I wish to claim that the establishment of organized, recurring, and high-stakes cooperative behavior in the form of collaborative foraging created a space in which early humans could reliably expect that their partner would provide accurate (i.e. helpful) answers to the best of their ability. This pattern of cooperative behavior—which I will assert as distinct from the experiences of our closest evolutionary relatives, who may engage in coordinated or cooperative behavior but in a less regimented or reliable manner—is one in which basic forms of question asking are highly motivated and fully enabled. Questioning is enabled both by the emergence of basic communicative gestures outlined by Tomasello and by the reliable collaborative pattern I just described. It is motivated because particular types of question asking can serve as highly efficient and effective foils to cooperative behavior within such a way of life.

The first questions to emerge would likely have been factual questions such as “what”, “who”, and “where” questions. Note that wherever I offer question-type examples such as these, the important thing is not the specific word(s) but rather the particular kind of informative response they are most often used to illicit. As a shorthand and clarifying example, I will often refer to factual questions as ‘what-type’ questions. Of course, one can almost always formulate some kind of
counter-example with any of these exemplary interrogative words (e.g. a ‘what’ question that concerns instructional or normative rather than factual information such as “what should I do?”, which could be instructional or normative depending on the context), but I provide the worded examples here merely as part of an effort to effectively communicate what I mean by a given question type. Factual questions, which are the locus of this first stage, are formulated and expressed in order to prompt an exchange of information about the physical world. The information being exchanged at this phase is not opinion-based or normative in any sense. Rather, it concerns evident realities about the shared surroundings of two parties (though these facts may initially be accessible only to one party and not the other).

During this Joint Intentional collaborative foraging stage, early humans would likely not have developed much if any verbal language. The reason for this is that conventional communicative systems such as language require a relatively stable, cohesive group structure to develop over time. It is not until humans formed ongoing, coherent groups enabling a higher degree of cultural inheritance that language could get off the ground. The what-type questions that I assert here emerged during the Joint Intentional stage and thus would have been asked and answered without conventionalized language. Both the asking and answering of what-type questions can be carried out through the application of three communicative tools possessed even by pre-linguistic humans. The first two, outlined above and discussed at length by Tomasello, are pointing and pantomime. It is easy to imagine how these gestures could be used to answer questions (e.g. pantomiming a certain animal in response to a
“what was that?”-type query, or pointing to a certain tree in response to a “where is the animal?”-type query).

The non-linguistic asking of questions, however, is especially aided by a third tool: the white sclera, colloquially known as the whites of one’s eyes. Unlike all other primates, who have dark (black or brown) sclera, humans have a white sclera that, when contrasted with our colored iris and dark pupil, facilitates gaze tracking. Tomasello posits, in what he calls the cooperative eye hypothesis, that one reason for the evolution of this distinctive ocular feature was to facilitate cooperation. One study he conducted found that while gorillas, bonobos, and chimpanzees are more likely to follow the motion of the experimenter's head, human children were more likely to follow the experimenter's eye movements (Tomasello, Hare, and Lehmann 2007). Eye contact, facilitated by the presence of a white sclera, coupled with pointing and pantomime could have been used to pose simple what-type questions at this phase. The pointing and pantomime contain the informational content of the question (e.g. pointing all around for ‘where’, pantomiming the object you’re interested in knowing more about), and eye contact situates that content as a question (i.e. “I am looking to you for this information”).

In order to clarify the types of behaviors that I am suggesting arose with the transition to Joint Intentionality, I will provide a few additional examples. It is important to note, however, that the particulars of these speculations are not especially important. Rather, they serve as general examples of the type of questioning that could take place without conventionalized language and yet still
reach beyond what other primates are capable of. We can begin with an example that, while not terribly complex, provides a clear model for the type of interaction I am interested in.

Let us imagine a pair of collaborative foragers out on a hunting expedition when suddenly, there is a rustle from behind a nearby bush. One of the partners (let’s call her Partner A) is positioned such that she cannot see what is behind the bush and the other partner (Partner B) is positioned such that she has clear view of that area. It is essential that both partners know, as quickly as possible, what is behind the bush because they need to act swiftly and collaboratively to survive or succeed. The issue at hand is potentially one of life or death as the bush could be concealing either predator or prey. Partner B is frozen for a moment looking at the creature behind the bush. Partner A, rather than take the time to reposition herself such that she can also see behind the bush, makes some kind of non-conventionalized vocalization to get Partner B’s attention. While making expectant eye contact with Partner B, Partner A points forcefully at the bush. Partner B, recognizing Partner A’s calling out for factual information, crouches to her knees and lifts her fingers behind her head, pantomiming a rabbit. Now that their factual knowledge is realigned, Partner A, uses this information to begin acting strategically in their joint pursuit of this newfound prey. Partner B does the same, basing her actions both on those of the rabbit and of Partner A.

What we see in this first example is a misalignment of knowledge (Partner B knows what is behind the bush, Partner A does not), a recognition of that
misalignment (Partner A understands from Partner B’s position and behavior that she can see what is behind the bush), a calling out for recognition and response (Partner A asks what is behind the bush using eye contact and pantomime), and finally a return of recognition and appropriate response (Partner B pantomimes the information that Partner A requested). Thinking back to our characterization of questioning in Chapter 1, this interaction qualifies as the asking and answering of a question. Furthermore, while this exact scenario has not been tested on non-human primates, it is safe to say, based on the Tomasello’s research, that a non-human primate would be unlikely to respond in this preferentially collaborative way (Rekers, Haun, and Tomasello 2011). The expected behavior in such a scenario would more likely be for the non-human primate subject to reposition themselves to see behind the bush themselves, rather than inquire with another individual who could already see.

For a second example, let us imagine that these same collaborative foraging partners are now crouching behind a boulder, hiding from a nearby predator. Partner B suddenly begins to move as if to come out from behind the boulder. Usually, these partners can collaborate by making inferences about each other’s strategic movements. In this case, however, Partner A is immediately aware that she does not understand why Partner B is moving as she is. Recognizing this misalignment of information, Partner A grabs Partner B to get her attention, puts her fingers by her mouth to pantomime the teeth of the predator that awaits them outside of their hiding place, and points in the direction that Partner B was moving. This series of actions (a calling for attention and a pantomime/pointing behavior reflecting a nearby threat) is
on a surface level a review of their shared knowledge. Given that they are hiding, Partners A and B are both aware that they share a mutual knowledge of the predator laying in wait. This review of their shared information, then, is not a giving of information but rather an asking for it. The implication is that, given their shared knowledge, Partner B’s behavior is incongruous. It implies, then, a call for Partner B to communicate the information that motivates her behavior. Partner B points up into a nearby tree, indicating that they can safely relocate into the tree, presumably to be more secure from the predator. Now armed with this information, Partner A joins Partner B in a swift emergence from behind the boulder and leap into the safety of the tree.

What we see in each of these examples is the use of a communicative gesture by Partner A in order to solicit the offering of factual information by Partner B. In the first example, the question being asked was something like “what is behind the bush?”. For the second example, the question being asked was to the effect of “what are you doing?” or “where are you going?”. The second example is slightly more fraught, as there may be an argument to be made that Partner A is inquiring about Partner B’s intentions or reasons rather than a physical fact about the world. I thought it was worthy of inclusion, however, because it does inquire into a physical fact: the future movement of Partner B. It also is an interesting example because it is the type of factual question that could plausibly lay the groundwork, so to speak, for truly normative questions later on. An analysis of normativity in Chapter 5 will further elucidate why this question is not fully normative, but the essential distinction is that
it deals only with whether or not the partners survive and not with what their way of life will be.

As we see in these examples, once off the ground, factual (what-type) question asking would serve to enable increasingly sophisticated and effective forms of collaborative behavior. This is because factual question asking constitutes a powerful and highly efficient means of informational exchange. With factual question asking, a cooperating pair can align not only their perspectives and goals (as outlined by Tomasello) but also their knowledge of the relevant features of the situation. With the efficiency of question-enabled information transfer, the cooperating pair can achieve this knowledge alignment without a large time investment.

This chapter began with a fairly detailed review of Tomasello’s shared intentionality hypothesis, and the evolutionary stages it entails. Subsequently, we reconsidered and amended some key philosophical terms within Tomasello’s account. Finally, we used features of the transition from Individual to Joint Intentionality to move beyond Tomasello in theorizing about the origins of what-type questioning. From here, we will consider how further developments in early human evolutionary history, largely as described by Tomasello, may have given rise to further, more complex forms of questioning.

The transition from Tomasello’s Joint to Collective Intentionality will be elucidated in the next chapter, which concerns the work of Kim Sterelny and the emergence of a new type of questioning: instructional questions. Using Sterelny’s apprentice learning model, I will elaborate upon Tomasello’s proposed account of this
transition and demonstrate how increasingly social and linguistically complex forms of questioning may have emerged.
Stage 2: How?

In the previous chapter, we explored a theory for the initial emergence of what-type question asking. The positive feedback loop wherein collaborative foraging both enables and is made more efficient by what-type questioning served as an expanded explanation for the transition from Individual to Joint Intentionality (note that I still use this term in a holistic sense, as outlined in the previous chapter). Tomasello puts forward an explanation of the transition from Joint to Collective Intentionality, which I reviewed in the previous chapter. However, while his explanation offers a useful broad framework for this transition, it leaves certain key issues unresolved: namely how early humans could suddenly transmit and preserve such high volumes of cultural learning. In order to better address this, among other concerns, I will in this chapter call upon the work of Australian philosopher Kim Sterelny. By incorporating Sterelny’s apprentice learning model, I will endeavor both to provide a robust explanation for the transition from Joint to Collective intentionality and to outline the development of a new, more social form of questioning: instructional (how-type) questions.

In this chapter, I am setting out to accomplish a number of things. First, an exploration of the complementary natures of Tomasello and Sterelny’s accounts will be interesting and productive regardless of its relevance to my broader argument.
Second, I will draw upon Sterelny’s work to posit the conditions for the emergence of instructional questioning. I hope not only that this account of instructional questioning will be a compelling addition to Sterelny’s model but also that it will serve as a kind of link between factual and normative questioning, as well as pre-linguistic and linguistic questioning.

I will begin with a review of Sterelny’s work, though it will be significantly more concise than my review of Tomasello’s. I chose to expound *A Natural History of Human Thinking* so thoroughly because the evolutionary stages it proposes are used throughout this essay to orient and contextualize my argument. While Sterelny’s work is of great interest to us, and indeed will play a crucial role in my theory of questioning, a less nuanced introduction will suffice given the nature of his argument and how it will be applied in this essay. Sterelny proposes an evolutionary niche, fortified by a series of positive feedback loops, and proceeds to explain a number of moments and phenomena within our evolutionary history using this niche. I will present Sterelny’s central proposition, the apprentice learning model, as well as one of the numerous more detailed applications of that model to an evolutionary problem. This review should be sufficient for understanding the type of explanation that Sterelny is interested in without digressing too greatly from our central points of interest. From there, I will attempt to craft a similar sort of explanation, but now applying Sterelny’s apprentice learning model to an issue not addressed in his work: the emergence of instructional questions. Before we incorporate Sterelny’s work, however, we must establish our location within Tomasello’s three stages.
At the point where we ended Chapter 3, Tomasello’s framework, along with the proposed role of what-type questioning, had left early humans at the Joint Intentional stage. Joint Intentionality is here understood as an interconnected way of life (encompassing organism-environment) wherein early humans engage in dual-perspectival forms of communicative and goal-oriented practices. Tomasello attributes the destabilization of this ad hoc collaborative foraging strategy to two related factors: increasing population size and threat of invasion from other humans (Tomasello 2014, 82-3).

As early humans enter Tomasello’s Collective Intentionality stage, he posits a wide range of changes to the human way of life. Particularly emphasized are new forms of shared group identity (Tomasello 2014, 83) and diachronic (i.e. intergenerational) knowledge transmission (80). Of course, the shared group identity to which he makes reference is comprised primarily of culture-specific practices (83). That is, the in-group is identified as those who engage in the cultural practices associated with that group (83). Thus, these two central developments are related in that diachronic knowledge of cultural practices plays a key role in continuously creating shared group identity.

Various communicative, cognitive, and behavioral changes accompany the emergence of more numerically and temporally expansive groups. These include normative self-monitoring (Tomasello 2014, 89), conventional communication (94), and the giving and asking for reasons (112). Tomasello explores these and other developments arising with and from the emergence of culture at length in his chapter.
on Collective Intentionality. That said, the chapter does not dwell long in proposing mechanisms for the emergence of culture itself. Tomasello does propose some key environmental factors (namely, population size), cognitive shifts (what he calls agent neutral thinking), and collective behavioral changes (intergenerational learning and normative behavioral monitoring) that would have enabled cultural knowledge to begin to accumulate. Most of this speculation, however, is quite broad and non-specific compared to his account of the transition from Individual to Joint Intentionality. Most importantly, these factors do more to illustrate what Tomasello understands to comprise culture rather than explain how culture may have actually arisen. It is for this among other reasons that I have chosen to incorporate Sterelny’s apprentice learning model into my account: it serves as a more detailed mechanism for the emergence of culture and the transition from Joint to Collective Intentionality.

Tomasello does make passing reference to Sterelny’s work in his chapter on Collective Intentionality (Tomasello 2014, 134). He cites apprentice learning not as a proposed mechanism for the transition from Joint to Collective Intentionality, but rather in a part of his book devoted to situating the Shared Intentionality Hypothesis amongst other evolutionary theories of human sociality. He concludes that Sterelny’s account is not incompatible with his own, calling it “useful and generally correct” (135). He distinguishes his own work, however, by its emphasis on thinking as well as its broader account of two key transitional periods in the evolution of human collaboration. Tomasello does not go into any significant depth with Sterelny’s work, but I would argue it would have been worth doing so. Tomasello’s theory is
concerned with numerous large-scale systematic transitions and as such does not examine the mechanics of this particular transition (from Joint to Collective Intentionality) in as much detail as would have been optimal. Sterelny’s apprentice learning model offers a concrete mechanism for the initial emergence and ongoing development of human culture and does so in a manner not incompatible with Tomasello’s broader account.

It seems that among the reasons Tomasello did not incorporate Sterelny’s work into his own account was that Sterelny’s approach does not place human thinking at the center of his evolutionary theory. That said, we have chosen, for the purposes of this essay, to adapt Tomasello’s theory as to move away from his focus on thinking. Because we are working with a version of Tomasello’s work that understands many different aspects of the human way of life to be valuable and inseparable, it is not a problem that Sterelny’s account does not emphasize thinking. For our purposes, that is, modeling the emergence of human questioning, it will be useful to reference as detailed as possible an account of the evolving human way of life at this particular stage. It is therefore necessary to examine Sterelny’s work in more detail, beyond its brief reference in Tomasello’s book.

The Evolved Apprentice

*The Evolved Apprentice*, Sterelny’s most recent book, tackles similar issues as does the work of Tomasello. Rather than sculpting a large-scale evolutionary stage theory, however, Sterelny sets out to address a more specific problem and expand his
model’s relevance from there. Sterelny, like Tomasello, recognizes the striking rapidity and scope of early human cognitive evolution (Sterelny 2012, 1). He agrees with Tomasello that cooperation was likely important in the evolution of uniquely human forms of cognition, but focuses specifically on social learning, highlighting some potential problems within the social intelligence hypothesis (10). While critics of the social intelligence hypothesis have primarily focused on problems posed by free-riders and Machiavellian social manipulators, Sterelny turns the reader’s attention instead to a seldom addressed but arguably more pressing question regarding the immense information transfer necessary for longstanding cooperative behavior (11). In order for collaborative foraging, and later even more complex collaborative behaviors, to become a stable environmental feature for early humans, there must have arisen a newly efficient system for retaining and expanding upon huge amounts of shared information (14). Specifically, Sterelny is concerned with the development, integration, and transfer of three types of information: 1) ecological information, 2) technological information, and 3) social information regarding group-coordination (15). Having presented his problem regarding the informationally demanding nature of collaboration, Sterelny proposes the apprentice learning model as a solution (36).

The apprentice learning model offers an especially strong solution to the information transfer problem of cooperation because it can develop incrementally, it allows for high-fidelity, high-bandwidth transfer of information, and it is consistent with current ethnographic data (Sterelny 2012, 36). Apprentice learning requires no
formal or institutionalized teaching, it instead entails only the structuring of an
effective learning environment for the learner by an expert (36). Unlike Tomasello,
Sterelny rejects the notion of any key innovation(s) being responsible for the
evolution of human cognitive capacities (75). Rather, he explicitly prioritizes the role
of positive behavioral-biological-environmental feedback loops in the development of
human social learning (75). Sterelny outlines two feedback loops that together hope
to provide an account of the evolution of apprentice learning, and other sophisticated
forms of cooperation.

The first feedback loop is between expertise, individual adaptation for social
learning, and organized learning environments. Adults could begin shaping their
offspring’s environments without any intention of doing so, merely as a by-product of
their ecological activity (Sterelny 2012, 36). The inadvertent construction of a rich
learning environment could include child observation of laboring experts, children
being called upon to help in skilled practices, children “overhearing” communication
between experts regarding a skilled practice, and children discovering and examining
lingering artifacts (complete, partially complete, broken, etc.) from skill practices.
While it can begin passively, once this trend is established, adaptations for social
learning will become exploitative of a new evolutionary niche (33). Furthermore, the
creation of organized learning environments will also exploit this niche; parental
traits that facilitate social learning will likely be selected for because they help
propagate the parents’ genes through their offspring (33). Individual social learning
and the creation of organized learning environments will then continuously feed back
into each other as social learning becomes increasingly important for successful functioning and procreation (34).

The second feedback loop is between life history, social learning, and expertise. The extension of childhood allows for an apprentice period of high-fidelity, high-bandwidth social learning. This learning period in turn allows individuals to survive and thrive in their environment, through the application of skills and practices acquired during their extended childhood. Finally, the surplus resources arising from this skilled environmental interaction allow for the further extension of both childhood and adulthood, facilitating even more development and passing on of expertise to the next generation through apprenticeship (Sterelny 2012, 30).

At the core of Sterelny’s apprentice learning model are these two positive feedback loops. Together, they produce a ratcheting up effect whereby early humans gradually create richer learning environments and evolve traits that facilitate learning and teaching. While there is a genetic component at play because genotypes that promote social learning will be increasingly selected for, Sterelny’s narrative largely concerns organismal construction of environments that facilitate social learning and require skillful knowledge (resulting from social learning) to navigate. A changing environment, brought about in part by the ecological activity of early humans, not only influences which traits will be adaptive, but also has a significant impact on how organisms develop. As we see in both of Sterelny’s feedback loops, development is an important part of understanding evolutionary change. Thus, through an ongoing interplay of genetic, environmental, developmental, and behavioral change, the entire
human way of life becomes more and more suited for and reliant upon social learning.

As one can imagine, the potential applications of such a model are vast because so much of human activity is contingent upon social learning. As previously mentioned, Sterelny enriches his evolutionary account by thoroughly carrying out a number of the most interesting applications of his model, including: explaining the lag time between the origin of our species and the appearance of culture (Sterelny 2012, 48-62), positing a reason for Neanderthal extinction (62-71), refuting the so-called “Grandmother Hypothesis” (which attributes our extended childhood to our size rather than social learning) (78-89), addressing the problem of “free riders” (those who benefit but do not contribute to a collaborative group) (179-184), and more. While each of these applications of the apprentice learning model contributes something important to Sterelny’s account, it would be excessive, and in many cases irrelevant, to discuss them all at length here. Instead, I will briefly explore one of them in order to provide an example of the type of explanation that Sterelny constructs with his model. I have chosen to discuss the “lag” problem, as it the most related to the topics at issue in this essay.

Anatomically and genetically modern humans emerged around 200,000 years ago (Sterelny 2012, 46). Consistent and robust anthropological evidence of modern human culture, however, only dates back around 60,000 to 40,000 years ago (46). While it is possible that this delay could be partially resultant from an imperfect anthropological record that is inherently biased toward the discovery of more recent
artifacts, the magnitude of cultural difference between so-called “First Sapiens” and “Moderns” is staggering enough to produce a consensus (46). Past thinkers have attempted to account for the lag time preceding the emergence of culture by focusing on symbolism and symbolic artifacts (49). Sterelny finds this approach lacking for a variety of reasons (e.g. the false equation of arbitrary/displaced symbolism with social marker symbols (51)), but ultimately understands its shortcomings as resultant of a larger problem: the tendency to characterize behavioral modernity in terms of individual human capacities (55). A more fruitful approach, argues Sterelny, is to understand behavioral modernity as arising from a positive feedback loop between individual cognitive capacities, structured learning environments, and demographics (59). Behavioral modernity is, per his model, the collective ability to perpetuate and improve upon complex systems of technical and informational knowledge (56).

While feedback loops connecting individual cognitive capacities and structured learning environments have already been expounded in Sterelny’s initial presentation of his apprentice learning model, he adds demographics here as a modulator for the effectiveness of this model (Sterelny 2012, 60). Like Tomasello, Sterelny understands larger group size to have been essential for the emergence of behavioral modernity. Larger groups are able to support specialization and redundancy where smaller groups cannot (59-60). Specialists are generally able to reach a higher skill level, meaning that as a group, larger volumes of information are passed to the next generation (60). Additionally, a group comprised of members with differing specialized knowledge is likely more predisposed toward innovation (both
through individual recognition of potential improvements and through
cross-fertilization between knowledge domains) than a homogenous group (60).

Redundancy has arguably even more profound effects. First, smaller groups
(which lack redundancy) are at greater risk for losing knowledge either through
gradual drift (i.e. fewer in each generation happen to acquire a given skill) or through
an unfortunate accident resulting in the death or incapacitation of the few individuals
possessed of that particular knowledge. Second, redundancy compensates for the
limitations of individual adaptedness for social learning, which many argue is in itself
quite low-fidelity (Sterelny 2012, 60). It is the social learning environment that, in
combination with individual adaptedness, results in high-fidelity learning (60).

Redundancy, resultant from larger group size, enables high-fidelity learning by
providing the learner with many opportunities for knowledge to be transmitted to
them by different experts in different ways (61). The result is high-fidelity
information transfer within and between generations.

Behavioral modernity is thus redefined as the collective capacity for retaining
and incrementally improving upon informational and technical knowledge, which
arises from positive feedback loops between individual adaptedness for social
learning, constructed environment, and group demographics. This reconception
dissolves the lag problem because it rejects the false equation of individual capacity
for social learning with the emergence of culture. That is, if behavioral modernity is
emergent from not only individual capacity but also from social learning environment
and demographics, then it is not so surprising that individual capacities for learning
can be present without behavior modernity if the other two factors are in flux. Note that this does not negate Sterelny’s earlier model, which presents individual adaptations for social learning and the construction of rich learning environments as having co-evolved. It is simply pointing out that these elements are truly inseparable in terms of comprising culture and thus, if one of them breaks down for whatever reason, certain knowledge and practices will likely fade out.

At this point, Sterelny reveals that the evidence underscoring the lag problem is not quite as simple as initially presented: there were some very early signs of high-fidelity, high-bandwidth knowledge transmission. As early as 280,000 years ago, Middle Stone Age points—sharpened rocks that could be fastened to sticks to form spears and require significant skill to craft—began to surface (Sterelny 2012, 57). Strangely enough, however, these traces seem to gradually die off as time went on, with such craftsmanship re-emerging again far later (57). A similar phenomenon can be identified in Ancient Australia. The challenges faced by the First Australians in their migration to Sahul about 45,000 years ago are so great that it is generally agreed upon that they must have been behaviorally modern humans (55). That said, after their arrival there is little sign of behavioral modernity (i.e. limited technology and symbolic culture) until around 20,000 years ago (55). Sterelny’s account proposes that both of these cases can be understood as changes in the social learning environment and/or demographics, which explain why the evidence of behavioral modernity can wax and wane even where individual capacities for social learning are not changing (61). In Ancient Australia, for example, the migrant groups would have
become more spread out and thus smaller and less connected to each other following
their migration, resulting in a demographic scenario that limited the perpetuation of
behavioral modernity for all the reasons described above (56). The lag problem is
thus not a problem in need of further solution at all but rather just another example of
this waxing and waning as a result of factors besides individual adaptedness.

While it may have appeared to be somewhat of a detour from our primary
objective in this chapter, I hope that my review of Sterelny’s answer to the lag
problem has provided the reader with some sense of the explanatory fortitude of his
apprentice learning model. Additionally, I hope it has further enforced that it is
essential to understand evolutionary and developmental change as characteristic not
only of the individual organism but also of the environment that organism helps
construct. We will now turn our attention back to the central project of this chapter,
which is a) to harness Sterelny’s model to create a more robust account of the
transition from Joint to Collective Intentionality and b) to investigate the role that
instructional questioning may have played in this transition.

Sterelny & Tomasello

The apprentice learning model works especially well to explain the transition
from Joint to Collective Intentionality because it requires no miraculous inciting
event to get off the ground. Apprenticeship can arise quite passively, as the mere
result of environmental circumstances that place a younger learner in observational
proximity to an older expert (Sterelny 2012, 13). Sterelny’s apprentice learning model
serves not only to contextualize the development of collaborative foraging but also, and more importantly for our purposes, suggests a mechanism for the incredible amount of information transfer and organization that would have been necessary for early human development of collaborative groups.

The transition from Joint to Collective Intentionality, and with it the transition from cooperative pairs to collaborative groups, is not as fully explicated as other portions of Tomasello’s theory. It is unsurprising, given that this transition likely spanned a long period of time and involved innumerable sub-transitions, that it could not be exhaustively outlined in a short book with a larger project to attend to. One advantage of the apprentice learning model in this context is that it need not review every transitional stage in the evolution of collaborative behavior. Instead, Sterelny’s model posits a mechanism (his series of feedback loops) which serves to explain how any number of collaborative innovations could have emerged on an accelerated evolutionary scale. Although Tomasello and Sterelny disagree on a number of points (quite significantly on notions of intentionality, an issue I addressed in the previous chapter), it is for this reason that I believe their accounts complement each other.

Tomasello’s work provides a useful broader evolutionary stage theory, although it contains some flaws both in terms of positing specific and sufficient mechanisms for the evolutionary stage development he outlines and relying too heavily on traditional notions of intentionality where he didn’t need to do so. Sterelny’s model is an effective foil for Tomasello’s stage theory because he proposes the apprenticeship feedback loops to begin with cooperative foraging, at what
Tomasello would classify as the Joint Intentionality stage. Sterelny suggests that once cooperative behavior such as collaborative foraging gets off the ground, cross-generational learning can arise as a byproduct of that ecological activity (Sterelny 2012, 16). The behavior shapes the environment, which in turn facilitates learning.

Sterelny understands cooperative foraging as a skilled activity. Early methods of animal tracking (Sterelny 2012, 12), nutrient extraction from mechanically and chemically protected plants (13-14), and weapon selection/fabrication (13) would have made for far more efficient and effective foraging. These sophisticated methods imply a degree of technical refinement that is honed not within a lifetime but over multiple generations. The theory is that collaborative foraging shaped the early human environment such that this type of knowledge began to spread cross-generationally. It is not difficult to imagine how collaborative foraging could lead to a kind of passive instruction. For example, a less experienced partner watches their more experienced partner engage in a previously unknown technique and decides to adopt it herself. Or a parent strategically deconstructs a protected plant to reveal its edible parts in front of their child, who in turn learns to handle the plant that way. Social learning thus begins where we left off in the previous chapter, with collaborative foraging, and without any radical inciting event sets in motion a feedback loop that will result in apprentice learning.

It would seem that the beginnings of apprentice learning, when learners are acquiring knowledge as a byproduct of expert ecological activity, have certain very
basic prerequisites such as sequential imitation. It is as the feedback loops lead to a ratcheting up of individual and environmental adaptedness to social learning, however, that the behaviors and modes of thinking that comprise Tomasello’s Joint Intentionality really come into play. As individuals and environments start to play a more directive role in intergenerational knowledge transmission, it is easy to imagine how capacities such as attention and goal coordination, pointing/pantomime, triangulated representation, socially recursive inference, counterfactual inference, and second-personal self-monitoring would contribute to the possibility for active instruction in an apprentice style interaction.

Once social learning becomes an important part of being an effective cooperative foraging partner, adaptations that facilitate social learning will be advantageous (Sterelny 2012, 34). This means that adaptations promoting the social acquisition of knowledge, which could be as simple as heightened curiosity or propensity to attend more closely to the activity of elders, will be selected for. Furthermore, if we take into consideration the selfish gene theory (an understanding of genetic material as the locus of natural selection), it stands to reason that this same evolutionary niche of social learning could be further exploited by adaptations promoting parental teaching (33). Such adaptations would not necessarily relate to explicit instruction, but could be as simple as increased tolerance to the presence of observing children or more performative manners of executing pre-existing ecological practices (making them easier for their children to replicate and inherit) (33). Thus, a feedback loop emerges between expertise, individual adaptation for
social learning, and organized learning environments. This feedback loop, a simultaneous carving out and exploitation of an evolutionary niche, will continuously promote both biological and cultural adaptation towards social learning.

In addition to expanding group size, cited as an important feature of this transitional stage by both Tomasello and Sterelny, the expanding human lifetime is essential for the emergence of culture. Sterelny notes that humans live approximately 20 years longer than other great apes (Sterelny 2012, 30). The possibilities for social learning are heightened by the extension of childhood (as well as the invention of adolescence), but children require a great deal of resources to support (30). It is thus a cyclical ratcheting up that allows the lifetimes of early humans to extend: cross-generational learning enables more effective ecological activity through expertise, which in turn enables adults to support children for longer and to live longer themselves, which enables even more cross-generational learning, and so on (29). Here we have the second feedback loop, between social learning, life history, and expertise.

Taken together, these two feedback loops provide a robust hypothesis for how certain key changes involved in the transition from Joint to Collective Intentionality may have come about. Firstly, it proposes a mechanism that can begin during the Joint Intentional collaborative foraging stage, as a natural outcropping of this ecological activity. Once off the ground, these feedback loops lead to exceptionally rapid adaptation exploiting a newly social niche. Many of the novel cognitive and behavioral features that Tomasello places at the Collective Intentional stage could
have been selected for because they exploit the social learning niche. Such adaptations may have included aspects of Tomasello’s ‘agent neutral thinking’ such as normative self-monitoring. Beyond individual adaptedness for social learning, the increasingly ideal social learning environments constructed via both feedback loops could also explain many of the innovations outlined by Tomasello such as the formation of groups, newly conventional communicative forms, and cultural institutions.

The Emergence of Instructional Questioning

My theory of question asking as it relates to Sterelny’s model (and the transition from Joint to Collective Intentionality) is relatively straightforward. All I wish to posit at this phase is that certain types of question asking would have been among the adaptations “fast-tracked” by the feedback loops associated with the collaborative niche of early humans. I will continue to use Tomasello’s three central stages to situate us, as I believe they do capture importantly different moments in human evolution, both in terms of question asking and collaborative activity more generally. Incorporating Sterelny, then, does not fundamentally diverge from Tomasello’s original theory but rather suggests a more specific mechanism for this particular transition: from Joint to Collective Intentionality.

Looking first to collaborative foraging, we have already discussed in the previous chapter how what-type questions—that is, questions concerning factual information—could have been part of a feedback loop wherein cooperative behavior
both enabled and was enabled by the asking and answering of such questions. What I wish to add in this chapter is the development of a new form of questioning, which emerged via Sterelny’s apprentice learning model. The kind of questions most relevant at this stage are instructional questions, which I will call ‘how-type’ questions.

Once again, the particular word “how” is not the key here. I use that word to help the reader better conceptualize the type of question that I am picking out. That said, there are of course instructional questions that do not use the word “how” (e.g. do I hold the ax in my left or my right hand?) as well as non-instructional questions that do use the word “how” (e.g. how are you feeling today?). The essential distinction at this stage is that questioning now serves the acquisition of instructional information in addition to factual information, which arose in the previous stage.

Sterelny’s model specifies that apprentice learning can begin without any active instruction. Apprentice learning at this phase is a mere side product of early human ecological activity. This initial phase would align with the earliest collaborative foraging behaviors being passed on. As time went on, however, the positive feedback loops described above would begin to result in the favoring of adaptations (both biological and cultural) that facilitated social learning. Such adaptations would be those which enabled and streamlined both teaching and learning behaviors. I wish to posit that the evolution of how-type questions would have occurred at this point.
Instructional questions are an incredibly powerful tool for learning. They allow the asker to pick out exactly the information they need, dramatically expediting the process of instruction. Unlike what-type questions, how-type questions allow for the transmission of information concerning behavioral regularities. That is, the information conveyed need not concern any fact about the world (presumably perceived by the answerer but not the asker) but rather a way of doing things, a regular practice (presumably familiar to the answerer but not the asker). Question asking, specifically how-type, could therefore have been an important part of early human transition from passive to active apprentice relationships.

How-type questioning may have been an important tool not only for learners but also for experts. As adaptations exploitative of the human social learning niche took off, apprentice relations begin to involve more explicit teaching. Exam questions, as mentioned in Chapter 1, are incredibly powerful tools for teaching that may have emerged through the apprentice model. An exam question is one in which the asker inquires about a piece of information in order to learn whether or not the answerer knows that information. Following the initial appearance of how-type questions and the beginning of teaching in apprentice relationships, experts could have used exam questions to inquire into the learner’s knowledge of either factual or instructional information. Not only could experts pick out the gaps in a learner’s knowledge through the particular questions asked by that learner, but with exam questions the expert could probe these gaps directly, further expediting the knowledge transmission process.
Sterelny emphasizes that what makes apprentice learning such a powerful model is that it enables high-bandwidth, high-fidelity learning; instructional question asking can be understood in the same way. How-type questioning is high-bandwidth because it increases instructional efficiency by a) directing the expert to any lingering points of confusion and b) providing the learner with a streamlined method for inquiring further at any point in the instructional process. How-type questions are high-fidelity because they are direct and explicit. As compared to questionless, purely demonstrative teaching, there are fewer ambiguities as to what the expert is trying to get across. How-type question asking, properly carried out, is a mechanism for transmitting knowledge regarding behavioral regularities from one individual to another in a highly efficient and reliable manner. It stands to reason, then, that instructional questioning would be a highly advantageous exploitation of the human social learning niche.

Furthermore, if what-type questioning could have arisen in the collaborative pair foraging stage, as was suggested in the previous chapter, then the communicative and cognitive foundation for how-type questioning would have been largely in place already. How-type questions likely would have emerged later than what-type questions because of their distinct functions. What-type questions are used to share factual information, presumably in order to more effectively cooperate or at least coordinate behavior. How-type questions, however, are tools for explicit instruction. The practice of teaching, as Sterelny points out, most likely arose only after other forms of collaborative behavior and social learning were established. It is thus
reasonable to assume that what-type questions, which are associated with general information and attention coordination, would have preceded how-type questions, which are associated with explicitly instructional interactions.

There are a number of developmental psychology research findings demonstrating that in humans, questions using the word “what” develop first, followed later by questions using “how” or “why” (note that “why” will be addressed in the next chapter). Questions using “what” typically emerge around age 2 (Tyack 1977) but “how” and “why” questions don’t typically arrive until 3-5 years, significantly later in development (Tyack 1977) (Rowland 2003). While developmental timelines are far from sufficient evidence to confirm evolutionary timelines, they can help provide a sense of the relative complexity of different behaviors and hint at a relationship of temporal precedence that may be relevant on an evolutionary as well as developmental scale.

It is also important to note that certain elementary how-type questions do not require verbal language. Just as apprenticeship can begin passively and become more efficient as it becomes more active, how-type questioning can begin without language and become more efficient as verbal language emerges through cultural evolution. The three communicative tools outlined as useful for what-type questions in the previous chapter—pointing, pantomime, and eye contact—can be used to pose basic how-type questions as well. For example, pantomiming one way of crafting a spear and then making expectant eye-contact (“is this how I do it?”) or pointing to different tools with eye-contact in turn (“which one should be used?”). Demonstration or
pantomime can also be used to answer such questions. For example, pantomiming the conventional way of crafting the spear or handing the learner the tool regularly used for their task. Calling upon capacities for counterfactual inference arising at the Joint Intentional stage (Tomasello 2014, 74), an expert could convey something she knows well to a learner who does not know, yet can be triggered to understand through pantomime.

That said, the efficiency advantages of instructional questioning would have exploded with the emergence of verbal language. A conventionalized linguistic system, alongside other rapidly evolving traits making for more engaged experts and learners, would have allowed for far more direct and pointed questions. Even the most basic conventionalized language would have helped early humans expedite the learning process by identifying the exact point of misunderstanding and rectifying it. How-type questioning, then, serves as a type of bridge between the linguistic and prelinguistic phases encompassed by my theory of questioning. While it is possible for basic how-type questioning to begin in prelinguistic humans, the effectiveness and applicability of such questions would have been widely expanded as language emerged in earnest. More efficient instructional questioning, and by extension more effective social learning exchanges, may have been among the many factors which motivated selection for linguistic behaviors.

So, after humans had formed into larger groups, instructional questioning would have been possible, evolutionarily motivated, and may have helped bring about subsequent innovations in the human way of life. It was possible as a feature of: a)
the ‘individual’ capacities (i.e. basic communicative and collaborative abilities, including those related to what-type questioning, the ability to jointly direct attention, TOM, pointing/pantomime, etc) and b) the niche constructed social learning environment (i.e. large groups of humans with skills and the resources to support an increasingly long early learning period). Sterelny explains at length why individual adaptations, behaviors, and environments that facilitate social learning would have been advantageous and thus selected for: they are exploitative of an evolutionary niche. I outlined above the ways in which instructional questioning would have facilitated social learning in such a way that would increase bandwidth and efficiency. Thus, instructional questioning would have been evolutionarily motivated at this stage. Finally, we have further reason to believe that instructional questioning likely emerged at this stage because of the way it appears to lay the groundwork for normativity. How exactly instructional questions lay the foundation for certain normative practices (including linguistic performances such as normative questioning) will be one topic covered in the next chapter. For now though, let us conclude that given the possibility and evolutionary incentive for the development of how-type questioning during the transition from Joint to Collective Intentionality (and the taking off of apprentice learning), it is reasonable to assert that it emerged at this point. Furthermore, given its potential as a highly efficient and effective tool for social learning, it is likely that how-type questioning helped facilitate the progression of human culture and with it, the evolution of normativity.

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2 I used the term ‘individual’ here to remain consistent with Sterelny’s terminology, but of course many of these abilities are really features of the larger organism-environment and cannot be isolated in any individual.
Normativity

Both Sterelny and Tomasello propose, in the latter stages of their theories, mechanisms for the emergence of normativity in groups of early humans. Both agree that it would arise with culture, but normativity plays a different role in each of their accounts. Tomasello uses normativity primarily to describe new forms of pre-existing cognitive capacities that are, in the Collective Intentional stage, expanded to the group level: for example, normative self-monitoring, in which an individual understands and regulates her behavior in terms of the social norms of the group(s) of which she is a member.

For Sterelny, the acquisition of norms operates by much the same mechanism as skill acquisition (Sterelny 2012, 153). He remarks that in order for his evolutionary theory to be robust, it must be able to account for the initiation and diachronic transfer of norms (152). Just as our minds and environments have, through incremental change, become adapted to the social learning of skills, so have they become adapted to moral learning (171). Sterelny’s account, especially in combination with Tomasello’s, provides a strong mechanistic foundation for discussing the evolution of human normativity. That said, as we will see in the next chapter, there is some further work to be done regarding how normativity ought actually to be understood in a naturalistic context. While I do not reject Tomasello and Sterelny’s claims that normativity arose from the ongoing evolution of collaborative ways of life, their accounts fail to fully acknowledge the important ways in which normativity is different from other features of collaborative practice.
Thus, before we can discuss normative question asking (our third and final question type) it is necessary to thoughtfully choose and fully explicate what exactly is meant by normativity in this context. In the next chapter, we will turn to a recent publication by philosopher Joseph Rouse to situate normative questioning within a notion of normativity that is fully naturalistic and retains an external accountability. We will see that while the very beginnings of normativity could theoretically have occurred without normative (what we will call ‘why-type’) questions, their emergence would have radically transformed normative engagement.
Stage 3: Why?

The previous chapters have brought us from Individual Intentionality all the way to Collective Intentionality, amending Tomasello’s proposed transitions with the roles that two different types of questioning may have played as well as a high-efficiency, high-bandwidth learning model proposed by Sterelny. Early humans have, by this point, organized themselves into groups that cohere using inherited knowledge of behavioral regularities. This knowledge is passed down, at least in part, through the apprentice learning model. Through this process, humans can collaborate (coordinating their knowledge, attention, goals, actions, etc) not only in partnerships but also on the group level.

As mentioned in the previous chapter, there is some debate surrounding the dates of the earliest anthropological evidence of distinct human cultures (Sterelny 2012, 57)(Tomasello 2014, 84). For the purposes of this account, precise dates are less important, however, than the mere fact that we have now reached the emergence of culture. Conventionalized language has begun to develop in earnest and intergroup competition is an important locus of natural selection. In this chapter, we will examine what comes after Tomasello’s Collective Intentionality. Issues arise in these new enculturated groups which call for new forms of articulation and with them, full blown normativity. I will be examining the
emergence of a new kind of questioning and arguing that it is characteristic of normativity. I will draw heavily upon the work of philosopher Joseph Rouse, specifically his most recent book *Articulating the World: Conceptual Understanding and the Scientific Image*, for my characterizations of normativity, conceptual understanding, and organism-environment “intra-action”. It is thus necessary, before examining our central question, to provide some background on Rouse’s work and how it diverges from that of Tomasello.

**Articulating the World**

Rouse begins by situating himself within a Sellarsian discourse. Wilfrid Sellars was a highly influential American philosopher concerned with, among other things, the reconciliation of what he calls the scientific and manifest images of man. The scientific image of man is oriented towards traditions that disregard the normative, understanding the world instead as consisting of imperceptible objects (like atoms) acting according to a framework of physical laws (Rouse 2015, 7). The manifest image, by contrast, prioritizes the awareness of oneself as man-in-the-world, casting persons as the fundamental constituents of existence and normativity as the relevant framework (8). Given that the scientific image undeniably arose from the manifest image, for it to reject the manifest image would constitute a demolishing of its own foundation. However, the manifest image, taken alone in its most straight forward form, has no way of accounting for itself as a natural phenomenon. There must, then, be some reconciliation of the
two in order for either to hold up under scrutiny. Rouse characterizes himself as a left-Sellarsian, meaning he is primarily interested in extending the manifest image to reach a naturalistic account of normativity in the world (11). Science, or any type of conceptual practice for that matter, is not the representation of the world from some elusive external standpoint but rather an ongoing process of articulation from within the world (31).

We have thus far examined two naturalistic accounts of human cognition that draw heavily upon theories of niche construction in their formulation of an evolutionary narrative. Not all theoretical applications of evolutionary niche construction are primarily interested in the construction of highly specified evolutionary accounts, however. Rouse’s *Articulating the World* takes on a significantly different explanatory project than Tomasello or even Sterelny. Rouse has a background in philosophy of science and as such is interested in formulating accounts of mind and scientific practice that are consistent and answerable to each other. Work in philosophy of mind and philosophy of science has each often failed in maintaining sufficient accountability to the other, despite their evident interconnection. Given his knowledge of both fields, Rouse is in a position to pursue an account that is fully naturalistic in two senses: 1) it situates our conceptual practices using an up-to-date scientific understanding and 2) it represents these practices in a manner that retains some accountability beyond its own judgements. In constructing such an account, Rouse both exposes past failures to do so and models a more reciprocally interdisciplinary way forward.
Rouse understands that an account of mind rooted in scientific principles must also accommodate an externally accountable scientific practice in order to be fully naturalistic. It is easy to imagine how accounts like Tomasello’s or Sterelny’s might undermine the validity of the very scientific claims upon which they are based. Situating human cognitive and linguistic capacities as having arisen in response to a highly specific evolutionary niche forces us to abandon the idea that human intelligence taps into some inevitable most-true understanding of the world. If the ways in which humans perceive and interpret the world are specialized rather than general intelligence adaptations, traditionally conceived objectivity in scientific observation and interpretation is called into question.

While general intelligence theories, which are largely evolutionarily implausible, allow for the easy retention of realist conceptions of objective science, more specialized adaptational accounts, which are generally more consistent with evolutionary theory, make traditional scientific realism more difficult to achieve. Scientific realism is potentially threatened by specialized evolutionary accounts of mind because if our cognitive capacities evolved to maximize behavioral efficacy in one area (e.g. linguistic communication, collaborative foraging), our perception and interpretation of the world may be skewed towards that particular goal, distorting our scientific understanding (assuming a common “view-from-nowhere” ideal for science). Thus, without an explicit re-conception of science as both arising through behavioral niche
construction and “objectively” accountable in some way, any specialized evolutionary theory of mind is likely to be self-contradictory.

Rouse therefore sets out to construct: 1) a naturalistic account of mind that is consistent with an adequate and up-to-date foundation of scientific practice and 2) an account of objectively accountable science that arises from a naturalistic mind. Note that it is the second of these goals that was left most largely unaddressed by our previous two authors. Rouse describes *Articulating the World* as an arch: each half upholds the other (Rouse 2015, 85). The first half is a naturalistic account of mind and the second half is an account of scientific practice. He intends for the second half of the book to be an example of the type of conceptually articulated practices he explores in the first half. He also intends for the first half of the book to be an example of the type of scientific account suggested by the second half of the book. It is ambitious of Rouse to tackle both of these projects within one book, but it is also integral to his explanatory method. *Articulating the World*, in both its structure and content, highlights how deeply accountable scientific conceptions of mind and world are to one another. The book makes this point while simultaneously constructing an account that renders them compatible. For our purposes, we will be primarily focusing on the first half of the book, as it is most directly relevant to our concerns around the origins of question asking. It may be clear at this point why I have chosen to base my exploration of normative questioning on Rouse’s work rather than that of Tomasello or Sterelny: an evolutionary account of the emergence of human questioning that does not provide
a basis for accountability within a conceptually articulated way of life risks casting all question-based discourse as arbitrary and ultimately meaningless. While Rouse’s work appears late in this essay, I hope I will demonstrate how previous chapters have set the stage for an account of questioning that is ultimately compatible with and supporting of Rousian normativity and scientific practice.

Popular approaches to characterizing conceptual understanding and its origins have tended to fall prey to a number of misguided notions surrounding evolution and language. Among these are the presumption that conceptual understanding is a trait that would have arisen in any organism with enough general intelligence (Rouse 2015, 87) and the Neo-Darwinian assumption that gradual phenotypic change in response to external pressures of natural selection must be the origin of any human evolutionary novelties (89). Rouse, by contrast, seeks to construct a new way of characterizing language and conceptual understanding that draws upon the so-called “extended synthesis” approach in evolutionary biology, which rethinks a number of assumptions from the received approach (90). The extended synthesis involves the reintegration of development into evolution, greater acknowledgement of plasticity within neural development, an interactive and multi-dimensional conception of evolutionary change, a more rigorous evaluation of human cognitive-behavioral comparability to our closest evolutionary relatives, and the application of this new discourse to the evolution of language (89-90). Rouse draws upon these innovations to resolve some of the
problems remaining in previous attempts to construct an adequate reconciliation of
the manifest and scientific images.

Unlike Tomasello, Rouse is not interested in formulating a stage theory of
cognitive evolution. Rather, his method consists of the reimagining of certain
notions relevant to mindedness and scientific practice. These notions include:
organism-environment interaction, conceptual understanding/articulation, and
objectivity. By re-specifying the meanings and applications of these concepts,
Rouse hopes to dissolve some of the barriers that have complicated the
formulation of mutually consistent theories of mind and scientific practice.

Rouse rejects standard conceptions of separately-definable organism and
environment (Rouse 2015, 186). Instead, he works within a framework of
goal-oriented organism-environment intra-action, wherein the apparent division
between organism and environment is merely a feature of larger patterns of
intra-action that he calls the organism-environment complex (186). Adopting the
notion of organism-environment intra-action as opposed to the standard interaction
model is more in keeping with the extended synthesis, as it casts evolution and
development as ongoing processes of change (and exchange) in which it is
incoherent to characterize an organism or environment apart from the other.

Rouse classifies the organism as a goal-directed process (Rouse 2015, 105).
Failure to live up to the organismal goal, that is the perpetuation of the process,
occurs when the organism or lineage ceases (105). Ultimate normative
accountability, then, originates with natural selection: which
organism-environment arrangements fail and when? Rouse’s understanding of organism-environment intra-action is especially compatible with theories of behavioral niche construction precisely because it is goal-oriented and dual-directional. Behavioral niche construction arises as the organism simultaneously navigates and constructs its environment in service of the goal-directed system. Conceptual practices such as language have co-evolved with humans through this feedback process, which can explain the evolutionary rapidity of their emergence.

Of course, a question remains as to what these conceptual practices actually are. After outlining and reaffirming John Haugeland’s arguments against what he considers to be the significant alternatives, Rouse advocates for a view of intentionality deeply rooted in ongoing conceptually articulated practices that are accountable beyond individual performance (Rouse 2015, 84). Rather than the standard notion of intentionality as object-directed content, Rouse understands intentionality as holistically normative. The conceptual content of an intentional comportment is specified by its position within a broader system of commitments (45). The world-directedness and conceptual-articulation of intentional comportments are deeply intertwined and cannot be separated (61-62).

Finally, after reviewing standard understandings of objectivity, Rouse proposes his own alternative: a model of two-dimensional normativity that serves as an “objective” standard for evaluating any conceptually articulated practice (Rouse 2015, 189). The first dimension of Rousian normativity concerns whether a
way of life continues and the second dimension, emergent in only humans through behavioral niche construction, concerns what that way of life will be (189). Conceptual normativity is two-dimensional in its accountability to both of these deeply intertwined standards. Note that both dimensions; 1) practical significance within a way of life and 2) meaning within the conceptual space; are non-arbitrary. Thus, despite a naturalistic and normative account of mindedness, a robust notion of accountability beyond themselves is retained for conceptually articulated practices, including science.

The re-conception of these terms allows for more compatible accounts of mind and scientific practice. Focusing on conceptually articulated practices rather than conceptual understanding and dissolving the organism-environment divide forces the abandonment of problematic subject-object conceptions of science. Thus, the scientific research enterprise becomes the locus for scientific understanding rather than the knowledge this enterprise generates (Rouse 2015, 365). Furthermore, based on his substitution of two-dimensional normativity for traditional objectivity, scientific claims are to be assessed in terms of this two-dimensional framework, not on the basis of epistemic or conceptual objectivity (367). Thus, Rouse’s re-conception of these terms not only supports an account of mind arising from evolutionary niche construction but also accommodates a robust and accountable scientific practice.
Situating Rouse in the context of Tomasello is not a particularly straightforward move on my part. One of the primary issues with doing so arises from their disparate treatments of intentionality. The traditional understanding of intentionality relies upon a distinction between organism and environment (mind and world) that is not appropriate within Rouse’s model, for reasons that should be obvious from the above discussion. That said, recall that in Chapter 2, we chose to proceed with an amended version of Tomasello’s hypothesis that understands the evolving ‘Intentionalities’ he describes not in any traditional sense of the word but rather as encompassing changes involving an entire organismal way of life. Under this reimagining, which I would argue does no violence to the most important facets of Tomasello’s theory, we are able to avoid a huge point of conflict with Rouse’s work.

Neither Sterelny nor Rouse accept the model of intentionality that Tomasello grafts onto his evolutionary stage theory. The primary conflict between Rouse and Tomasello arises from the fact that the locus of Tomasello’s shared intentionality is mental states. For Rouse, the new ways of life that Tomasello describes should be understood as issues rather than states. Central to Rouse’s conception of conceptual normativity is its being continuously and actively in question. This kind of normativity requires a sufficiently complex process that is integral to a way of life; a synchronic state cannot have representational content. To have this kind of content is to be caught up in a certain kind of practice so it must be temporally
extended. So while there must be a richly articulated neutral structure in place for the types of processes Tomasello would carve out as “mental states”, it is a dynamic structure, and thus to call it a state would be misleading. There is no static or independent representational tokening in such a dynamic structure or system.

Secondly, to say that anything (issue or state) is mental implies that it is a private representational or cognitive state which one can then make public and share. Once again, this conception of intentionality conflicts starkly with Rouse’s work, which points in the opposite direction. One might say that Rouse’s characterization of conceptual understanding works from the outside in, but even this would be misrepresentative because it creates too concrete a distinction between mind and world, organism and environment. Rouse understands conceptual understanding as arising with ongoing conceptually articulated practices. To think of concepts as things inside the brain is to deeply misrepresent their embeddedness in the world. Under Rouse’s conception of normativity, the important transitions that Tomasello is characterizing should not be understood as mental states becoming shared mental states but rather as transformations within spatially and temporally extended ongoing practices. Living a way of life that picks out an environment in relation to it in a systematic and holistic way differentiates and articulates the world into partially autonomous parts such that the position of the one can be interrogated in relation to the whole.

I chose to reimagine Tomasello’s Intentionality in order to render moot some of these more problematic assumptions. By amending his theory to encompass an
evolving way of life rather than evolving types of metal states, it is not only made compatible with Rouse’s work but also, I believe, more fully captures the transitions Tomasello describes in their holistic form. Although it may seem to undermine Tomasello’s work to strip it of its traditional Searlian intentionality, I consider it an important and permissible move for two reasons. Firstly, the most compelling and useful parts of Tomasello’s theory for our purposes here are his empirical claims. Tomasello’s empirical work is well researched and cogently organized. When I asked Tomasello at a talk at Yale in January 2018 why he chose to focus so heavily on human thinking in his work, he answered me by identifying himself as a psychologist and emphasizing the ways in which that role influences his approach to organizing empirical information (Tomasello 2018). While he acknowledged that his work concerned the evolution of many different aspects of organism-environment, he chose to focus on thinking because it is of interest to him (Tomasello 2018). This brings us to my second reason: that it is very much possible that Tomasello is already describing the types of ongoing organism-environment intra-actions and conceptually articulated practices that Rouse characterizes but simply is not identifying them as such. The disparities between the two accounts may in fact be rooted in emphasis and what is “thematized” (to use philosopher Edmund Husserl’s terminology) rather than any irreconcilable incompatibility. Regardless, Tomasello’s account describes ongoing transitions in not only thinking but also communicative behaviors, organismally-shaped environments, and intergenerational learning. He writes at
great length about how these so-called “mental states” are shaped by these other factors, and in turn impact behavior, environment, etc. Even if Tomasello himself would not choose to characterize his stages this way, it is not much of a stretch to understand them as ongoing changes in a way of life rather than evolving mental states.

Tomasello’s evolutionary stage theory is robust and highly useful for the project at hand. As such, we will continue to use his framework to model a stage theory of questioning even as we incorporate Rouse’s work. One can situate the type of conceptually articulated practices that Rouse expounds as emerging some point after Tomasello’s Collective Intentionality stage. Rouse’s work relies on the existence cultural interdependencies of some kind, which enable meaning in the space of reasons. Such patterns of systematically interdependent performance could only exist at the point where groups of early humans had achieved a sufficient degree of cohesion.

Tomasello defines culture in terms of a few key points. First, he makes note of the fact that other primates, especially chimpanzees and orangutans, do indeed have culture (Tomasello 2014, 82). Once again, the key distinction he identifies in early human culture is its especially collaborative character (82). The collaborative capabilities of early humans, emergent from collaborative foraging behavior, translated into a new kind of culture once they formed into coherent groups. This brings us to the second point: intergenerational learning (84). Tomasello emphasizes that early human propensity for collaboration enabled a high degree of
intergenerational learning (84). I have here, of course, made use of Sterelny’s apprentice learning model in a more detailed and nuanced unpacking of this claim. Finally, Tomasello suggests that the collaborative precedent also meant that early human groups involved a high level of normative accountability (86). That is, because collaboration was so essential for success in the human realm, humans living within groups would have remained highly motivated to conform to expectation and display their reliability as collaborators and to hold others accountable as such (86). Tomasello’s proposed origins of early human culture thus provide a reasonable foundation for Rouse’s work. Between collaborative groups with conventions (including language), intergenerational learning (catalyzed by apprentice learning), and social pressure to motivate high normative accountability, early humans were poised to break into two-dimensional normativity. Note that we are here moving beyond the scope of Tomasello’s originally proposed theory, though we are using it as our foundation. We will now be exploring a third transition: from regularity to full blown normativity. I will argue that questioning, specifically what I will call ‘why-type’ questioning, is essential for this final transition.

Normative Questioning

I have so far discussed two types of questions: those regarding factual information (what-type) and instructional information (how-type). For this final stage, however, I am interested in a form of question that is not concerned with
information per se. Normative questions (which I will also call why-type questions) are those which put into question the norms that govern a practice or way of life. Indeed, these types of questions are themselves constitutive of normativity, in a sense to be explored in more detail below. As with previous categorizations, the word ‘why’ is not the crux of the issue but rather a helpful nod to the type of language one might expect to find in a normative question. It is meant to guide the reader to a casual understanding of the sort of question to which I am referring.

One evolutionary pressure that may have been related to the rise of normative questioning is heightened competition between cohering groups. As previously stated, the type of normativity described by Rouse requires a high degree of shared cultural knowledge because meaningful content arises only in relation to a larger system of beliefs and desires. Tomasello discusses a phase of early human intergroup competition, wherein the more cohesive groups (i.e. those with culture) would have out-competed the others (i.e. those without culture). I am proposing an additional stage following this one, wherein all of the remaining groups have regularities and conventionalized behaviors (culture), but not the same ones. The locus of competition then shifts from whether or not a group has culture to what that culture consists of. There should be an obvious parallel here with the two dimensions of Rousian normativity. Noticing that other groups have different cultural knowledge seems to naturally give rise to a questioning of one’s own group regularities, or at least a kind of puzzlement with the disparity between
groups. It may also be possible that such uncertainties could arise within a single
group (between different ways of doing things), but the evolutionary benefit of a
mechanism for addressing these uncertainties would still have been on the level of
intergroup competition. With tools such as question asking, cooperation, and basic
cultural infrastructure, puzzlement gives way to questioning, debating,
experimenting: the active articulation of one’s world. Thus, this natural subsequent
stage of encultured intergroup competition gives rise to the second dimension of
normativity and inducts humans into the space of reasons. For the first time, what
is at stake is not just the practical implications of a behavioral regularly but also
how the group will comport itself.

Normative (why-type) questioning arises from competition between
culturally developed groups because those groups with a mechanism for
‘optimizing’ (or rather, further articulating) their way of life will outcompete those
with static or arbitrary behavioral regularities. Groups that can use normative
questioning to evaluate and reconcile divergent efforts to maintain their shared
way of life will outlast those without such performances, but more on this later. As
we’ve seen in the previous chapters, question asking of other kinds may have been
quite developed by this time, including questioning with conventionalized
language. The emergence of this newest form of questioning, then, requires little
behavioral evolution but rather entails a sort of reorientation of the human way of
life. It is through the asking and answering of why-type questions (understood as
complex practices encompassing numerous elements of the
organism-environment) that the second dimension of normativity is opened up and subsequently rearticulated in an ongoing way.

While factual questions, as well as some basic instructional questions, could have theoretically been asked and answered without conventionalized language, normative questions are a different story. There is not any way to ask a why-type question through pointing, pantomime, and eye-contact beyond the vaguest expression of confusion. This need for conventionalized language is one of a number of reasons that why-type questions likely would have emerged later than what-type and how-type questions. How-type questions serve as a convenient link between verbal and non-verbal questioning because while they are possible without conventionalized language, they become vastly more effective and efficient with the development of language. Thus, they could have emerged before language and still acted as part of the pressure driving linguistic evolution. Why-type questions, by contrast, require language or some other form of conceptually articulated performance because they are embedded in the explicit giving of and asking for reasons.

Communication and collaboration in the space of reasons must be conceptual because it makes use of normative information that is not available for reference in the physical world. Of course, one can conjure uses of the word ‘why’ to acquire causal information about the physical world (e.g. Q: “why did you fall?”, A: pointing to a root on the ground). However, the type of question I’m exploring in this chapter is a particular kind of why question: normative questioning. Some
would consider the instructional information being transmitted during the previous stage to be normative. Rouse, however, prefers to reserve the term for the two-dimensional conceptual normativity he describes. Instructional information acquired via a how-type question, assuming it is not followed up with a why-type question, is (ideally) a regularity and not a norm because it is not opening up space for further articulation. When someone asks how something is done, the answerer can safely assume that what the asker wants is a description of the regularity and not to open up a debate on the issue. When someone asks *why* something is done, the answerer’s assumption is the opposite.

This “why” phase constitutes a transition from asking a question to putting in question. That is, understanding what is already taken for granted as something that is open to ongoing consideration and rearticulation. Rouse considers this openness to be characteristic of normativity as such. There is a sense in which blindly following a rule no matter what is failing to live up to genuine normativity. One must understand the rule as an expression of a normative issue and it might require violation of the rule in order to answer to the ultimate normative concern at stake. If a practice is truly given and non-negotiable it is not really a norm: it is a behavioral regularity. Why-type questioning is thus characteristic of normativity in general. Unless you are willing to *put into question* a practice, it cannot be considered fully normative in the Rousian sense. It is for this reason that question asking, specifically why-type, is not only useful but absolutely essential for navigating a two-dimensionally normative way of life.
All that said, it must be acknowledged that why-type questioning alone was likely not the beginning of normativity for early humans. Indeed, the building and sustaining of an interdependent way of life is continuously at issue in a collaborative engagement such as large-scale groupings of early humans. While it would be convenient to draw a clear dividing line between how- and why-type questions where normativity emerges with the latter, it would be an oversimplification. Two-dimensional normativity is characteristic of the conceptually articulated way of life that evolves in these early human groups, and why-type questioning plays a crucial role in that way of life. Why-type questioning is a way of identifying, articulating, and responding to divergences already at issue. Even so, there are some important differences between why-type questioning and those two question forms previously examined.

What- and how-type questions enable the acquisition of information that another individual has in order to promote more efficient engagement in a collaborative activity. Why-questions, at least of the kind that I am interested in, render the conditions on the very possibility of having such an activity at issue. This is a different type of concern, and one which is more distinctly human. It is essential to note that two-dimensional normativity being characteristic of humans and not other organisms does not reflect any uniquely human specialness or superiority but rather is just another feature of a particular organism-environment intra-action. That said, while many other organisms (including primates) have vastly diverse and effective modes of information acquisition, why-questioning
serves a purpose not called for elsewhere in the natural world: the construction of a conceptually articulated space of reasons. It is thus unsurprising, in a certain sense, that linguistically capable non-human primates do not appear to ask why-type questions.

Another key distinction which accompanies that just discussed is the varying directedness of these different types of questions. Because what- and how-type questions are generally used to acquire information from another, they would have been directed towards an individual. Even in cases when a question of this kind is posed to a group (i.e. “can anyone tell me what this is?”), the intent is for an individual to respond. Why-type questions, by contrast, can take the form of “something of concern to anyone” or “something we should all consider.” The detachment of the question from a particular answerer is an important step which opens up the possibility for a variety of new agent-neutral question-based practices, such as philosophy.

That said, the previous agent-directed forms of questioning remain important and vitally useful to the human way of life. Beyond that, it seems (as is reflected in this stage theory) that normative questioning is parasitic off these earlier forms. Indeed, they may be mutually parasitic because why-questions enable a more effective coordination of interdependent ways of life. As we have seen time and time again in this project, the grammatical form of a question can have different kinds of speech acts connected to it. It seems far more likely that questioning originated for a purpose more connected to the physical world and more straight
forward forms of collaboration. It was then appropriated for conceptual articulation and two-dimensionally normative ways of life.

**Normativity in Development**

There has been a significant amount of research investigating the nature and function of Why-questioning in human children in recent years (“Why”-questions being those that literally use the word “why”). As mentioned in the previous chapter, Why-questions typically emerge significantly later in child development than What-questions (Tyack 1977). There remains some debate over the function of Why-questions in young children. It seems that there might be a useful distinction to be made between their practical and developmental functions. On the practical, day-to-day level, Why-questions are tools for information acquisition (Bova 2013). Children investigate physical causality from a very young age, and with Why-questions, they are able to begin extending that causal reasoning to unseen or unseeable objects and concepts. Developmentally, the outcome of using this practical information acquisition tool is a more generalized ability to engage in reasoned argumentation, manage multiple perspectives, and think rationally in conversational contexts (Blum-Kulka 2002). These findings were specifically related to family dinnertime conversation, which is a culturally endorsed daily practice that facilitates intergenerational learning, reflection, and argumentation.

I would argue that, just as why-type questioning may have inducted early humans into the space of reasons, it might serve a similar function in development.
It is through Why-questioning, at least in part, that children learn to give and ask for reasons. As some broader findings would suggest, this practice over time gives rise to a newfound engagement in rational argumentation, and by extension the child's way of life becomes increasingly tied up in a two-dimensionally normative pattern of interconnected practice. Perhaps, then, part of the developmental role played by Why-questioning is the induction of children into the space of reasons.

**Replying to the Question of Questioning**

Having thus presented the final piece of my threefold evolutionary-philosophical stage theory of questioning, let us conclude with a brief review of the questions posed and answered in this essay. In Chapter 1, I introduced the Question of Questioning as well as some key concepts including niche construction and the particular definition of ‘question’ to be used in the remainder of the essay. I then crafted a more complete posing of my central question by conducting a literature review of the relevant non-human primate linguistic research in Chapter 2. I found that while there are certain lingering ambiguities, the available evidence points to non-human primates being unable (or at least unwilling) to ask questions. This conclusion was key in placing the start of my stage theory after the evolutionary divergence of humans from our last common ancestor with chimpanzees. Having built a conceptual foundation and identified a loose evolutionary time frame, I began outlining my answer to the Question of Questioning. In Chapter 3, I drew upon the work of psychologist
Michael Tomasello to orient my account of the initial emergence of questioning in humans. This first type of questioning—which I called what-type questioning—concerns factual information about the world and arose in conjunction with collaborative foraging behaviors in early humans. Chapter 4 drew upon philosopher Kim Sterelny’s apprentice learning model, in conjunction with Tomasello’s framework, to construct an account of new questioning forms that came with the organization of early humans into larger, more enduring groups. In this social learning niche, newly instructional (how-type) questions were adaptive and enabled. Finally, Chapter 5 has examined a third and final form of questioning arising with and from the emergence of culture and other systems of collective conceptually articulated practice. The work of philosopher Joseph Rouse was essential for orienting this last form of questioning—normative or why-type questions—amongst appropriate conceptions of normativity, conceptual understanding/articulation, etc.

Together, Chapters 3-5 have offered an answer to the question I posed in Chapters 1 & 2. My threefold evolutionary stage theory—specifying the evolution of factual, instructional, and normative questioning—has, I hope, constituted a robust reply to the Question of Questioning. The Question, presented first in Chapter 1, can be summarized as “why do humans ask questions?” I have attempted to answer by demonstrating how various increasingly complex forms of questioning might have figured into human evolutionary history. Given that all of these questions would likely have arisen following human divergence from our
closest primate relatives, it is unsurprising that other primates do not appear to ask
questions, despite having latent capacities for other linguistic behaviors.

If, as I assert here, normative question asking (i.e. why-type questioning) is
foundational for our way of life, then it is especially important to understand its
evolution. I wish to suggest that question asking is not a late-arriving supplemental
linguistic ability but rather one important facet of a deeply interconnected and
gradually changing way of life. As with any species, the human way of life is
resultant of our evolutionary history. We understand, through theories such as niche
construction, that this history arises not from unidirectional environmental influence
on the organism but from two-way organism-environmental relations. Question
asking, it seems, was born of this organism-environment intra-action and has been a
key factor in the construction of human cooperative, apprenticeship, and cultural
evolutionary niches. If this is indeed the case, then the nature and origins of question
asking is of great interest not only in question-based disciplines such as philosophy,
but for any endeavor seeking to characterize or contextualize the human way of life.
Epilogue

Philosophy as a Question

I have asserted in this essay that question asking is far from an ad hoc ability that arose alongside any number of other linguistic forms. Rather, question asking transformed throughout human evolutionary history and played a critical role in enabling the ever-changing human way of life at numerous stages. At this point, some reservations may linger concerning where my account leaves us in regard to the character of philosophy itself. It is an understandable worry that a naturalistic account of questioning could undermine disciplines built around questioning by diminishing them to a runaway adaptation. Ultimately, however, I believe that the implications of my account are quite the opposite. Understanding questioning as fundamental and critical to human activity throughout our evolutionary history only serves to underscore the urgency and legitimacy of question-based practices.

Through my exploration of questioning and its evolutionary origins, I have come to understand philosophy in a somewhat new light. Philosophy—understood here as a conceptually articulated, two-dimensionally normative practice—is continuous with why-type questioning as outlined in the previous chapter. Philosophy is a putting-in-question that is largely unconstrained by considerations of finding an answer. The possibility of skepticism as an intelligible philosophical conclusion speaks to the prioritization of normative questioning over answerability within the
discipline. Philosophy is best encapsulated by “why” because philosophical questions tend to aim not at acquiring (factual or instructional) information per se, but rather at opening spaces for debate and discourse.

Philosophy can be thus be understood as a process of distilling and elaborating upon modes of normative questioning that arose from the sort organism-environment intra-actions described in previous chapters. The practice of philosophy is an extension of our narrative for questioning because it continuously gives rise to new ways of focusing, refining, and expanding upon why-type questions. It is an ongoing process of interrogating self and world through normative questioning, and while claims and assertions are useful tools as well, it is the formulation of particularly discerning questions that has typically led to breakthroughs in philosophy. It is the harnessing of normative questioning that makes philosophy such a powerful form of world articulation and the especially careful, strategic, and systematic nature of that harnessing that renders philosophical questioning different from other types of questioning.

Philosophy adopts a questioning stance to examine many interconnected facets of the human way of life, including questions themselves. This essay is of course itself a prime example of a philosophical investigation of questions, but it is far from unprecedented in that respect. Beyond projects such as mine that concern questions directly, any kind of philosophical discourse—given the discipline’s rootedness in normative questions—is at least implicitly an investigation of what it is to question. In continuously working from, with, and beyond a constantly evolving
set of normative questions collectively (though perhaps not unanimously) deemed philosophically relevant, philosophers are opening new avenues for conceptual articulation and continuing the evolution of human questioning.

There is much more to be said about philosophy as a questioning discipline, especially in light of an evolutionary-philosophical characterization of the origins of questioning preceding philosophy. For considerations of this essay's concision and focus, however, let us leave those questions open for the moment as lines of future philosophical investigation. I will conclude by returning to the issue, first addressed in Chapter 1, of my project's philosophical relevance. When I originally discussed this matter, I pointed to considerations of format, citations, and the applicability of my work to previously raised philosophical questions (e.g. those concerning intentionality, normativity, etc). I would venture, however, that the most compelling philosophical content of this project is not only in its addressing pre-existing questions but in its posing of its own question—which is, of course, inseparable from the pre-existing discourse in which it is situated. In formulating the Question of Questioning and subsequently outlining an original treatment of questioning in light of it, I hope that this essay has opened up some new space for philosophical practice. As with any work of philosophy, my goal with this project was to, in any small way, expand the field of articulation within this shared practice. With that point in mind, let me conclude with this: whether or not the reader has been wholly convinced by my answer, I hope at least that they have been intrigued by my question.
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