

1 **Pragmatic Interpretation and Signaler-Receiver Asymmetries in Animal Communication**

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4 **(5,340 words)**

5

6 *Abstract:* Researchers have converged on the idea that a *pragmatic* understanding of
7 communication can shed important light on the evolution of language. Accordingly,
8 animal communication scientists have been keen to adopt insights from pragmatics
9 research. Some authors couple their appeal to pragmatic aspects of communication with
10 the claim that there are fundamental *asymmetries between signalers and receivers* in non-
11 human animals. For example, in the case of primate vocal calls, *signalers* are said to
12 produce signals *unintentionally* and *mindlessly*, whereas *receivers* are thought to engage
13 in *contextual interpretation* to derive the significance of signals. We argue that claims
14 about signaler-receiver asymmetries are often confused. This is partly because their
15 authors conflate two conceptions of pragmatics, which generate different accounts of the
16 explanatory target for accounts of the evolution of language. Here we distinguish these
17 conceptions, in order to help specify more precisely the proper explanatory target for
18 language evolution research.

19 **Keywords:** *animal communication, pragmatics, signaler-receiver asymmetry,*
20 *language evolution*

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24 **Signaler-Receiver Asymmetries and Pragmatic Interpretation in Animal Communication**

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26 **Gricean Communication and the Evolution of Language**

27 Prominent theorists of language evolution have converged on the idea that pragmatic
28 phenomena are of fundamental importance to the emergence of language (Tomasello 1999,
29 2008; Sperber and Wilson 2002; Scott-Phillips 2014, 2015). In particular, some of these authors
30 have argued that it is the emergence of capacities for ‘Gricean’ or ‘ostensive-inferential’
31 communication, operating in conjunction with cooperative motivations, that is the seed of human
32 language. At the heart of these arguments is a conception of human linguistic communication
33 that goes back to Paul Grice (Grice 1957). Grice’s central idea was that human communication
34 is made possible by hearers’ interpretive comprehension of speakers’ communicative intentions.
35 What Grice called ‘speaker meaning’ is a matter of a speaker producing an utterance (acoustic,
36 written, gestural, or otherwise) with the intention of (a) producing an effect on the psychological
37 states of some receiver, and with the further intention of (b) producing that effect in part by
38 means of the receiver’s recognition of that intention. The speaker (or gesturer) *intentionally* and
39 *overtly* (or ‘*ostensively*’) produces an utterance with the intention of soliciting some response
40 from her interlocutor (typically by aiming to produce some belief in her, or to solicit some
41 action). The hearer infers the speaker’s communicative goal through recognizing the speaker’s
42 intention to communicate, and infers the content of this intention on the basis of what the speaker
43 said. The speaker’s intention is fulfilled just when the receiver recognizes her intention (and
44 when this recognition plays some part in producing the intended effect). Call this the *Classical*
45 *Gricean* picture of communication.

46 On the Gricean view, communicative intentions can play a foundational role in
47 understanding the nature of language because they are *independent* of language. Grice took
48 speaker meaning to be conceptually prior to conventional, structured linguistic meaning (Grice
49 1967[1987]). He envisaged an explanation of the standard meanings of words and sentences in
50 terms of ‘ossified’ speaker meanings; viz., the meanings that speakers in a group regularly – if
51 not always – intend to communicate by utterances. This feature of Grice’s account suggests a
52 ‘*pragmatics-first*’ approach to the evolution of language, since it explains the emergence of
53 conventional *semantic* properties of linguistic items (such as words and sentences) from acts of
54 producing utterances with communicative intent.

55 The Classical Gricean picture requires more than that sender and receiver possess
56 concepts and draw inferences (conscious or unconscious) that deploy those concepts. It requires
57 that both senders and receivers have a ‘Theory of Mind’ (hereafter ToM); that is, a capacity to
58 ascribe beliefs and other psychological states to creatures other than themselves. Insofar as
59 Gricean communication presupposes such social cognition, a Gricean approach to understanding
60 the evolution of language introduces a clear explanatory task: to explain the phylogenetic
61 emergence of the relevant capacities in our hominin ancestors. As Origgi and Sperber put it, it
62 implies that “language as we know it developed as an adaptation in a species already involved in
63 inferential communication, and therefore already capable of some serious degree of
64 mindreading... the existence of mindreading in our ancestors was a precondition for the
65 emergence and evolution of language” (2000: 20).¹

66 This approach is controversial, since explaining the emergence of such social cognition –
67 including a capacity for propositional and even recursive thoughts – *prior* to the emergence of
68 propositional-compositional language would seem no less difficult than explaining the evolution

69 of language itself. Incorporating the Classical Gricean view into an account of language
70 evolution thus means trading the ‘language Rubicon’ for a ‘psychological Rubicon’ (see Bar-On
71 2013, and this volume).

72

73 **Gricean Communication and Signaler-Receiver Asymmetries**

74 The Classical Gricean view supposes that to be a Gricean communicator, an individual
75 must be capable not just of intentionally producing and responding to signals, but also of acting
76 with and attributing *communicative intentions*. The production of utterances with
77 communicative intentions and their comprehension is cognitively demanding, because according
78 to the Classical Gricean view (Sperber 2000; Scott-Phillips 2014, 2015) they require entertaining
79 fourth-order meta-representations of mental states – something that has yet to be identified even
80 in ten-year-old children (Liddle and Nettle, 2006; see Moore, Forthcoming b). Despite this
81 evidence, researchers have often taken it for granted that the abilities required for Gricean
82 communication are present in young children but not in nonhuman animals (e.g., Sperber 2000;
83 Tomasello 2008; Corballis 2011; Scott-Phillips 2014, 2015). Even assuming that nonhuman
84 animals have *first-order* thoughts (i.e. thoughts about the world, including others’ behavior) and
85 possess various concepts and are able to draw inferences (conscious or unconscious) using those
86 concepts, many doubt that they have higher-order thoughts about others’ mental states. Thus,
87 Tomasello, Call and Hare conclude that “in contrast to human children, chimpanzees may not
88 understand ... such things as ... communicative intentions” (Tomasello, Call & Hare, 2003: 156).

89 Even apart from animals’ comparative lack of ToM capacities, there seems to be a
90 difficulty in regarding animal vocalizations, specifically, as a source of insight into human
91 communication. It has long been assumed that primate vocalizations, especially, are involuntary

92 emotional responses to salient stimuli (e.g., Tomasello 2008; although see Slocombe et al. 2010;
93 Slocombe and Zuberbühler 2007; Crockford et al. 2012 for challenges). If this assumption is
94 correct, then primate calls are not a species of intentional behaviour. For this reason, many
95 researchers have argued that we should focus on the *comprehension* and not the *production* of
96 primate calls to tell us what we want to know about language evolution.

97 Some of those who adopt the Gricean approach to the evolution of language have argued
98 that the receiver's side of the sender-receiver relationship raises no problems peculiar to human
99 communication, since nonhuman receivers regularly deploy interpretive mechanisms when
100 responding to (even unintentionally produced) con- and extra-specific signals. This, it is
101 claimed, reveals a fundamental *asymmetry* between animal senders and receivers. On this view,
102 defended by Fitch (2010), the real explanatory challenge for language evolution research is to
103 explain the emergence of *senders* who act with Gricean communicative intentions; the problem
104 of the receivers' contribution was solved long ago.

105 Some empirical data appears to support the speaker-hearer asymmetry claim. Wheeler
106 and Fischer (2012) review evidence suggesting that non-human primates lack the voluntary
107 control over their vocalisations that humans have. In their words,

108 the same neurobiological circuits that are responsible for innate vocalizations, including
109 laughter and reactions to pain in humans, exist in both nonhuman primate and human
110 nonverbal vocal production systems; the more derived parts responsible and necessary for
111 voluntary control of vocalizations seem to be limited to humans, or at least have not been
112 identified in other primates. (2012:197)

113 Thus, in the words of Seyfarth and Cheney, when primates learn about the world from hearing

114 another's screams, they "acquire information from signalers who do not, in the human sense,
115 intend to provide it" (2003: 168).

116 Unlike human utterances, calls produced by primates also appear not to be produced with
117 sophisticated other-directed goals in mind. For example, Seyfarth and Cheney have shown that
118 vervet monkeys produce calls that dramatically affect the *behavior* of their audience, but without
119 seeming to take into account the psychological states of their audience (Seyfarth and Cheney
120 2003). In producing e.g. 'contact barks', baboon callers also seem to show little awareness of
121 their listeners' states (of mind or otherwise) (Cheney et al. 1996). Thus, on the part of signalers,
122 there seem to be only affective *reactions* to a perceived situation, albeit ones that may exhibit
123 sensitivity to the presence of a suitable audience.²

124 Whereas animal vocal production appears to be unsophisticated, animal receivers show
125 an impressive capacity for making contextual inferences to extract information from others'
126 signals. Thus Seyfarth cites experiments (Bergmann et al. 2003) that show that baboon listeners
127 who witness a sequence such as 'A threat-grunts to B and B screams' must be attributing to A a
128 disposition to act toward B in a very specific way. Seyfarth thinks this supports the view that, *as*
129 *listeners*, "baboons (and probably many other animals) deduce information about events and
130 scenes in the world from the vocalizations that other animals make ... extract[ing] detailed,
131 propositional-type information from signalers" even in the absence of sophisticated, intentional
132 production (personal communication). Tomasello, too, finds a "stark contrast" between the
133 "flexible comprehension" exhibited by call receivers and the inflexibility exhibited by call
134 producers (2008: 16f.), and he cites as the reason for the lack of flexibility the fact that
135 nonhuman vocalizations "are mostly very tightly tied to emotions" (2008: 17). If this is right,
136 then there seems to be an asymmetry between inflexible signalers and sophisticated receivers in

137 at least some animal communication systems.

138 With this asymmetry in mind, Wheeler and Fischer conclude that “any continuities or
139 parallels that exist between the communication systems of humans and our extant primate
140 relatives reside not in the ability of signal producers to transmit symbolically encoded
141 information, but in the flexible, learned responses of receivers” (2013: 199). Accordingly, they
142 recommend that “a more productive framework” for primate communication research should be
143 “pragmatics, the field of linguistics that examine the role of context in shaping the meaning of
144 linguistic utterances” (2013: 203).

145 Combining the asymmetry claim with a Gricean conception of the task for a theory of the
146 evolution of language, Fitch draws the following conclusion:

147 [A]nimal communication, before language, largely involved signalers who generate
148 signals either automatically (e.g. innate calls) or selfishly (“manipulations”), and thus
149 obeyed no Gricean maxims. *Listeners, on the other hand, have been processing these*
150 *signals inferentially, fulfilling their half of the Gricean equation, for the entire history of*
151 *communication systems. ... The component of this Gricean model that demands special*
152 *evolutionary explanation is ... the speaker’s contribution to this cooperative endeavor.*
153 *‘Going Gricean,’ then, required a fundamental change in the rules of animal*
154 *communication on the part of signalers, and this step is a logical necessity before*
155 *language could get off the ground. (2010: 135, emphases added; see also *ibid.* §4.11).*

156 This shifts the target of language evolution research. Followers of Grice take the primary
157 task of language evolution research to be to provide an account of the social and ecological
158 selection pressures that led to the emergence of subjects’ capacities to both *act with and*
159 *understand* communicative intentions (Sperber & Wilson 1995; Origgi and Sperber 2000;

160 Tomasello 2008; Scott-Phillips 2014). On their view, animal communication systems differ from
161 human languages precisely in being fully captured by the (non-Gricean) ‘code model’, on which
162 *neither* animal signalers nor animal receivers exhibit Gricean mindreading capacities. Thus, they
163 would deny that there is a signaler-receiver asymmetry that is relevant to the emergence of
164 Gricean communication. By contrast, Fitch claims that animal receivers have long been
165 ‘fulfilling their half of the Gricean equation’. For Fitch’s view to be right, we have to take it for
166 granted that our nonhuman ancestors already had the relevant cognitive abilities needed for
167 *flexible, pragmatic* interpretation, so that all that would require explanation is the phylogenetic
168 emergence of *speakers* who were motivated to produce utterances with Gricean communicative
169 intentions. (See also Hurford 2007: 332 and *passim*.)

170 So, despite agreement about the need for a pragmatics-first approach to language
171 evolution, there are now two different agendas on the table. According to the first, an account of
172 language evolution must explain the emergence in phylogeny of subjects who can act with and
173 attribute communicative intentions. On the second agenda, language evolution research need
174 explain only the emergence of *speakers* who are able to put existing cognitive capacities to use in
175 the production of communicative acts.

176 The apparent disagreement stems, at least in part, from the presence of two different
177 conceptions of pragmatics. The signaler-receiver asymmetry described above is relevant to the
178 explanation of the evolution of language on *one* but not the other. If theorists of language
179 evolution are to embrace a pragmatics-first approach, then, before settling on the agenda for a
180 theory of language evolution, they must be clear on this distinction.

181

182 **Signaler-Receiver Asymmetries and Pragmatics**

183 On the approach advocated by Tomasello, Scott-Phillips, Sperber and Wilson, and others,
184 it is not enough that animal receivers extract rich information from signals. What needs to be
185 established is that, when interpreting signals, receivers make inferences *about signalers'*
186 *communicative intentions*. But from the fact that receivers extract rich information from the
187 signals they receive (*even if* they do so inferentially) it does not follow that their doing so
188 depends on their employment of (even a rudimentary) Theory of Mind. Many creatures extract
189 rich information about their physical environment without attributing mental states to anyone.

190 The ability to make inferences about the significance of a call in light of contextual
191 information is one that Grice himself would contrast with the ability to understand
192 communicative intentions. His notion of speaker meaning is introduced in contrast with what he
193 labeled *natural meaning*. The latter is the sort of significance we assign to various natural signs,
194 as when we say, e.g., “Those dark clouds mean rain”. In contrast with utterances that possess
195 speaker meaning, natural signs possess natural meaning independently of anyone’s intending to
196 communicate anything by them. An astute observer can learn to recognize natural meaning by
197 learning the causal correlations between the presence of the sign and what it signifies. Thus, the
198 hearer of an animal call can learn that it correlates with the presence of some specific danger
199 whether or not it was produced intentionally, and thereby derive the call’s natural meaning
200 independently of attributing communicative intent.

201 Returning to Fitch’s formulation of the speaker-hearer asymmetry, if animal signals are
202 issued unintentionally, then it would seem odd to credit receivers with a *Gricean* interpretation
203 of them. For this would suggest that hearers regularly attribute communicative intentions where
204 none exist. If animal *signalers* do not ‘fulfil *their* half of the Gricean equation’, then at best we
205 could credit animal receivers with regularly – but *falsely* – *attributing* communicative intentions.

206 If signalers never act with Gricean intentions, such attributions would at best be idle. Moreover,
207 on the face of it, ‘receivers’ and ‘signalers’ designate different *roles*, not distinct subcategories of
208 creatures, with their own distinct psychological capacities. The receiver of an alarm call on one
209 occasion is likely a producer of such a call on another. So whatever psychological capacities
210 animals are thought to possess as receivers, it is unlikely that they disappear when the same
211 animals assume the role of signalers. So either *both* animal signalers and receivers should be
212 credited with a capacity for ostensive-inferential communication or *neither* should be.

213 Perhaps when Fitch claims that animal receivers ‘fulfill their half of the Gricean
214 equation’, he has in mind something less cognitively demanding than the ability to attribute
215 communicative intentions. Perhaps his idea is simply that animal receivers are astute interpreters
216 of the *natural* significance of *unintentionally produced* signals. He does write that there is
217 “strong evidence that sophisticated inference is common among primates” (2010: 189).
218 However, while Fitch argues that monkeys, prairie dogs, suricates, ground squirrels, many birds,
219 and even chickens, all produce a great variety of calls that are claimed by Fitch to be
220 “inferentially interpreted” by receivers despite the absence of any “intentional encoding” (2010:
221 191), this would not support the conclusion that these species are Gricean interpreters.

222 If animal receivers are not *Gricean* interpreters, then this ‘pragmatics-first’ approach is
223 different from the one advocated by Origgi and Sperber, Tomasello, and other Griceans. In that
224 case, the form of the pragmatics-first approach that focuses primarily on the contextual
225 inferences of animal receivers is only indirectly relevant to their theories of language evolution.
226 Moreover, from the Gricean perspective, once it’s acknowledged that animal receivers neither
227 act with *nor* attribute communicative intentions, then there is no basis for maintaining that
228 animal communication exhibits a ‘fundamental asymmetry’ that is relevant to a pragmatic

229 understanding of language evolution. Whatever asymmetry there is between signaler and
230 receivers, it is not relevant to a Gricean understanding of what is required for the emergence of
231 language.

232

233 **Signaler-Receiver Asymmetry and Pragmatic Interpretation: Diagnosis**

234 There are two different sorts of cognitive prerequisites for genuinely Gricean communi-
235 cation. First, there are interlocking speaker-hearer *rational mindreading* capacities: the capacity
236 to issue utterances with other-directed informative-communicative intentions, and the capacity
237 for attributing of those intentions (on the hearer’s side). In addition, at least on the hearer’s side,
238 *inferential* capacities are also needed to figure out the *specific content* of the message the speaker
239 is trying to convey, based on the evidence provided by the speaker and the context of the
240 utterance. When drawing a sharp distinction between animal and human communication, and
241 when speculating on the Rubicon that must have been crossed to explain the advent of language,
242 neo-Gricean thinkers focus on the first set of (mindreading) capacities. By contrast, Fitch,
243 Hurford, Wheeler and Fischer, and others (including Scarantino & Clay 2015), who are looking
244 to find evidence for precursors of language in the behaviors of existing animals, focus on the
245 second set of (inferential) capacities. Assuming “inference” is understood in a suitably relaxed
246 fashion it is uncontroversial that inferential capacities exist in the animal kingdom. However,
247 this observation does little to support the conclusion that animal receivers are in any way
248 *Gricean* interpreters. But then the puzzle for language evolution is as much to explain the
249 emergence of Gricean interpreters as it is to explain how signalers have become Gricean
250 producers.

251 If this diagnosis is correct, it clearly reveals that, when Fitch talks about animal receivers
252 as engaging in pragmatic interpretation (and “fulfilling their half of the Gricean equation”), he
253 must have in mind something much weaker than is required by the Classical Gricean view. For,
254 as noted earlier, contextual interpretation need not presuppose the attribution of communicative
255 intentions. So the observed disparity in flexibility between signalers and receivers does not
256 support any symmetry in “fulfilling one’s half in the *Gricean* equation”.

257 Fitch’s Gricean reading of the asymmetries likely turns on a conflation of two different
258 sorts of pragmatic phenomena, which have been described independently by Carnap (1942) and
259 Grice (1957). Carnap introduced the term ‘pragmatics’ to cover the study of those aspects of
260 meaning that are dependent on contextual (or ‘situational’) factors. On this reading, pragmatic
261 phenomena include the various ways in which the same sentence (type) might be interpreted
262 differently in different contexts. (So, for example, “It’s raining” might be used to convey a
263 different proposition on different occasions.) Pragmatics in Carnapian sense can also cover the
264 ways in which an animal alarm call (understood as a type) might be assigned different
265 significances (and so elicit different responses) in different circumstances. Consider for
266 example, the finding by Palombit, Seyfarth, and Cheney (1997) that male baboons are more
267 likely to respond to calls produced by females with whom they have mated than other females –
268 particularly where those females have a dependent offspring and are in the presence of a
269 potentially infanticidal male. Wheeler and Fischer’s treatment of such differential responses as
270 pragmatic phenomena is in keeping with the Carnapian notion.

271 Although Grice’s work on pragmatics encompassed the ways in which the interpretation
272 of words and sentences can vary with their use (and thus context), he was primarily interested in
273 a deeper phenomenon than the context-sensitivity of interpretation – namely the dependence of

274 linguistic meaning on a special kind of (communicative, audience-directed) intentions. He
275 offered an analysis designed to capture the structure of those intentions, which must be
276 understood by hearers if they are to comprehend the speaker's intended meaning. In addition to
277 an analysis of the nature of speaker meaning, Grice (1975), introduced a set of heuristics –
278 'Conversational Maxims' – to which hearers can appeal in trying to make sense of speakers'
279 communicative intentions (referred to by Fitch 2010: 135, quoted above).

280 On the Gricean view, to engage in pragmatic interpretation just is to attribute
281 communicative intentions. Therefore on the Carnapian *but not* the Gricean version of
282 pragmatics, there can be phenomena of pragmatic interpretation even in the absence of
283 intentional communication. To recap:

284 Carnapian pragmatics is the study of the variation (and derivation) of the significance of
285 sentence (or signal) types with the context of production.

286 Gricean pragmatics is the study of the production of utterances with communicative
287 intentions and their mindreading interpretation by interlocutors.

288 These different notions of pragmatics have made their way into the literature on animal
289 communication without being properly distinguished. Moreover, they yield different accounts of
290 what is involved in a pragmatics-first approach to language evolution. If we treat Fitch, Wheeler
291 and Fischer, Cheney and Seyfarth, as making claims about Carnapian pragmatic phenomena,
292 then it is clear that what they have in mind is not the attribution of communicative intentions, but
293 simply hearers' ability to make discriminations about the significance of various bits of
294 environmental information – including information derived from unintentionally produced alarm
295 calls. This is not the sense of pragmatics to which Tomasello and others are appealing when
296 giving an account of the Gricean foundations of language evolution.

297 Conflating these two different senses of pragmatics threatens to be pernicious. For
298 example, when observing that primate receivers of calls can derive different messages from the
299 same calls in different situations – and thus engage in *Carnapian* interpretation – one can
300 mistakenly conclude that understanding such interpretation can help account for the phylogenetic
301 emergence of abilities needed for Gricean communication. While there may be some overlap in
302 the abilities deployed in Carnapian contextual interpretation and Gricean mindreading
303 interpretation, the former are in no way sufficient for the latter. Since Gricean but not Carnapian
304 interpretation requires possession of sophisticated ToM, there could be (and likely are) creatures
305 capable of Carnapian contextual interpretation alone.

306 At times, the slide between the two senses of ‘pragmatics’ is made explicitly. For
307 example, Scott-Philips (2014, 2015) argues that there is a fundamental, qualitative difference
308 between animal communication, which can be fully understood on the ‘code model’, and human
309 communication, which is essentially ‘ostensive-inferential’ (Scott-Phillips (2014, 2015). On the
310 neo-Gricean view that he defends, it is the absence of the ability for ostensive-inferential
311 communication that explains why non-human great apes did not develop language. Pragmatic
312 phenomena on *this* approach are understood in the Gricean way. Yet, Scott-Phillips reverts to
313 the Carnapian conception when defining pragmatics as “the branch of linguistics that studies
314 meaning and language use in context” (2015: glossary; see also Scott-Phillips 2010). His use of
315 the term ‘pragmatics’ is thus not univocal. The same equivocation seems to be present in work
316 by Fitch (2010), Hurford (2007), and sometimes even Tomasello (2008: 14-15).

317

318 **Concluding Remarks**

319 There *are* interesting asymmetries between signalers and receivers in animal
320 communication – including these described by Fischer and Wheeler (2012) and others. Indeed,
321 even within Gricean dyads, there are marked differences in ‘cognitive load’ between speakers
322 and hearers (Moore, 2013). For example, Gricean communication requires that hearers infer
323 speakers’ communicative goals – but not that the speakers infer their own goals. This suggests
324 that Gricean communication is cognitively more demanding on *hearers*, reversing the asymmetry
325 claims considered earlier.

326 Our goal here has not been to argue against all of the assumptions that motivated the
327 original asymmetry claims. For example, the possibility that some primate calls are not
328 produced voluntarily is at least partly independent of questions about the phylogenetic
329 emergence of the capacity for Gricean communication. Some empirical evidence suggests that
330 great apes’ call production may involve more voluntary control than has been assumed
331 (Slocombe et al. 2007, 2010; Crockford et al. 2012). However, while voluntary control over
332 production is necessary for acting with Gricean intentions, it is not sufficient. So this empirical
333 evidence does not show that these calls are produced with Gricean intentions; and their precise
334 relevance for the study of language evolution still requires clarification.

335 We hope to have shown that the pragmatic asymmetries highlighted by Fitch (2010) and
336 Wheeler and Fischer (2012) are at best indirectly relevant to the study of language evolution.
337 Failure to recognize this is likely to undermine our interpretation of comparative data, since an
338 equivocal use of the label ‘pragmatics’ risks masking deep differences between the two
339 conceptions of the task of language evolution research. For example, on the Carnapian
340 conception of pragmatics, existing forms of animal communication may seem to be continuous
341 with and more immediately relevant to theorizing about the evolution of language than on the

342 traditional Gricean conception. That is why Tomasello, Scott-Phillips and others have argued
343 that animal communication does *not* illuminate the origins of language, and that language
344 evolution required the emergence in phylogeny of a completely new form of communication that
345 presupposed the capacity to act with and understand communicative intentions.

346 Our view is that language evolution research would now be best served by asking what
347 could constitute genuine precursors to Gricean communication, and by looking for evidence of
348 such precursors in animal communication. One way to pursue this line of research (favoured by
349 Bar-On 2013, and this volume), would be to consider what forms of language (or proto-
350 language) might have emerged in phylogeny via the operation of *non*-Gricean mechanisms, and
351 prior to the emergence of a capacity to produce and comprehend utterances with communicative
352 intentions. Recognizing forms of animal communication, like *expressive communication*, that
353 resemble Gricean communication in certain (but not all) respects and identifying non-Gricean
354 mechanisms (such as ontogenetic ritualization, voluntary control, and imitation) may then
355 provide valuable insights into the emergence of human communication in phylogeny.

356 An alternative approach (Moore, 2016, Forthcoming a, Forthcoming b) argues that
357 classical interpretations overstate the socio-cognitive abilities that Gricean communication
358 requires, and that once we reconsider the demands of Gricean communication, it is appropriate to
359 conclude that great apes are *already* Gricean communicators. On this approach, other instances
360 of Gricean communicators in the animal kingdom may not be rare – rendering the study of
361 animal communication directly relevant to understanding the evolution of language after all.

362 These different approaches to studying precursors or early forms of Gricean
363 communication may well be complementary rather than incompatible. The fact that they can be

364 pulled apart, however, suggests that there can be several different paths to progress in language
365 evolution research. All approaches could benefit from a more fine-grained characterization of
366 the various asymmetries that exist in animal communication systems, as well as from a more
367 nuanced account of what is entailed by a pragmatics-first approach to language evolution.

368

369 **Notes on Contributors**

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376 the phylogenetic emergence of uniquely human forms of cognition and culture, and conducts
377 empirical studies of the communicative abilities of children and animals.

378

379 **Further Reading**

380 Cheney and Seyfarth's (2008) *Baboon Metaphysics: The Evolution of a Social Mind* and
381 Tomasello's (2008) *Origins of Human Communication* are classic books on primate cognition
382 and communication. Tomasello's book, especially, develops an important account of language
383 evolution; as does Fitch's *The Evolution of Language* (2010). For the authors' views on the role

384 of communicative intentions in language evolution, see Bar-On (2013; this volume) and Moore
385 (2016; Forthcoming b).

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453

¹ Additionally, Tomasello (2008) argues that Gricean communication is a cooperative, reciprocal endeavor, and that consequently it could emerge only “within the context of collaborative activities” (2008: 7). Moore (forthcoming a) argues against this claim.

² Some recent evidence undermines aspects of this asymmetry claim. For example, see Crockford et al. (2012) for evidence that chimpanzee vocalizations are both produced voluntarily and sensitive to the others’ knowledge states.