

1 **Four misunderstandings about cultural attraction**

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3 **WORKING PAPER – Do not quote without permission**

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16 **Abstract**

17 Cultural attraction theory (CAT, also known as cultural epidemiology) is a research agenda  
18 the purpose of which is to develop causal explanations of cultural phenomena. It is an  
19 evolutionary approach to culture, in the sense that it treats culture as a population of items  
20 of different types, with the frequency of types changing over time. Now more than 20 years  
21 old, many positive contributions to this goal, both theoretical and empirical, have been  
22 made in its name. However, ongoing discussion of the merits of this approach, and of its  
23 points of contact with other, related research agendas, is hampered by some specific  
24 misreadings and misunderstandings, about both the goals and the claims of cultural  
25 attraction theory. Here, we diagnose and address these critiques. In the course of doing so,  
26 we give precise definitions of key terms, we describe the key differences between cultural  
27 attraction theory and other evolutionary approaches to culture, and we explain why CAT  
28 theorists place particular emphasis on the role of cognition in causal explanations of culture.  
29 We conclude that existing critiques have not identified any issues that demand fundamental  
30 revision of CAT, and we bring attention to some important directions for future research.

31

32 **Keywords:** culture, cognition, evolution, cultural attraction, cultural evolution, cultural  
33 epidemiology

34

35       **1. Introduction**

36

37           Over the past twenty or so years, a research agenda known variously as ‘cultural  
38 epidemiology’, ‘an epidemiology of representations’, and ‘cultural attraction theory’ (CAT)  
39 has aimed to develop causal explanations of cultural phenomena. This agenda is most  
40 closely associated with the work of Dan Sperber, but is by now highly collective enterprise  
41 (e.g. Boyer, 1998; Claidière et al., 2014; Morin, 2016a; Sperber, 1996; *inter alia*). It argues  
42 that a natural science of culture should draw inspiration from the science of medical  
43 epidemiology, in which macro phenomena, such as epidemics or proliferating addictions, are  
44 explained as the cumulative effect of the many micro processes involved in individual  
45 events; and, correspondingly, that the disciplines of anthropology and psychology should  
46 have a similar, cognate relationship to one another as that which already exists in medical  
47 science, between epidemiology and pathology.

48           To help meet this challenge, Sperber and other CAT theorists have developed and  
49 appealed to notions of ‘attraction’, ‘attractors’, and ‘factors of attraction’ (we will provide  
50 description and examples of each of these throughout this paper). There is a growing body  
51 of empirical work that has found it productive to pursue this agenda and make use of its  
52 various theoretical notions. This literature covers a range of cultural domains that includes  
53 both the global and general, and also the local and specific (e.g. Atran, 2002; Boyer, 1994; De  
54 Cruz, 2006; Enfield, 2015; Heintz, 2007; Miton et al., 2015; Morin, 2013; Regnier, 2015;  
55 Wengrow, 2013; *inter alia*). In tandem with this growth, CAT has been the subject of critical  
56 discussion, especially so in recent years (e.g. Acerbi & Mesoudi, 2015; Buskell, 2016, 2017;  
57 Driscoll, 2011; Henrich & Boyd, 2002; Henrich et al., 2008; Richerson, 2017; Sterelny, 2001,

58 2017; Whitehouse, 1996). This commentary has made positive contributions to the  
59 literature, by raising a number of important questions and challenges for CAT.

60         However, ongoing discussion is hampered by the continued recurrence of some  
61 specific misreadings and misunderstandings, of both the goals and the claims of cultural  
62 attraction theory. Here, we identify and address these problems. Specifically, we describe  
63 and explain how, contrary to some commentary: (i) CAT is not circular, or tautological; (ii)  
64 CAT's causal ontology is not limited to psychological factors alone; (iii) CAT is not the same as  
65 other approaches to cultural evolution, just in different clothing; and (iv) attractors and  
66 attraction are statistical notions, and not themselves anything concrete or causal. We do not  
67 claim that the issues we address are universal, but they are sufficiently common, and  
68 sufficiently diverse in their origins, to be holding back dialogue and understanding. Our goal  
69 here is to remove these barriers.

70         The next four sections address each of the above four issues in turn. In the conclusion  
71 we highlight some other important of CAT that have been comparatively neglected in  
72 theoretical discussion to date.

73

## 74         **2. Cultural attraction theory is not circular**

75

76         Let us begin by addressing one plain misreading of CAT: the idea that it may be  
77 inherently circular. To do this, we first summarise one recent empirical application of CAT, as  
78 a way to illustrate the sort of explanation that CAT argues for in theory, and attempts to  
79 achieve in practice. We will then describe the critique of circularity, and explain why it is  
80 misplaced.

81           In some cultural environments gaze direction is strictly codified, with either all  
82   portraits having direct gaze, or none; because, for instance, direct eye contact is taboo. In  
83   others, gaze direction is free to vary. Detailed empirical study of gaze in European  
84   Renaissance paintings, and Korean painting during the Joseon dynasty, shows that when  
85   gaze direction is free to vary, it does not do so at random, but there tends instead to be a  
86   long-term trend away from averted gaze, and towards direct gaze (Morin, 2013). One  
87   plausible explanation of this is that direct eye contact is especially salient and attention  
88   grabbing to humans, in comparison to averted gaze, and this causes direct gaze paintings to  
89   tend to be more famous than others, which in turn causes new generations of painters to  
90   paint a higher proportion of direct gaze portraits than their predecessors, because they learn  
91   by observing famous paintings (*ibid.*). In the terminology of CAT (taking both the  
92   assumptions and the findings of this specific piece of work at face value), there is *attraction*  
93   towards portraits with direct gaze. Such portraits are, in turn, called *attractors* (see §5 for  
94   more detailed discussion of how attractors are defined).

95           Explanations of this sort CAT have sometimes been read as being circular, or  
96   tautological. Specifically, it has seemed, for some readers, that for a cultural item to be an  
97   attractor it must be frequent, stable, and long-lasting within a population; and that the  
98   frequency, stability, and longevity of cultural items are explained in terms of their being an  
99   attractor. We have often heard versions of this view expressed in person, and read versions  
100   of it in print. Here are three examples: “to call a fashion or a custom a cultural attractor...  
101   simply repeats the fact that certain kinds of cultural representation are stably and frequently  
102   transmitted... The[se] models represent the consequences of transmission biases but they  
103   explain nothing about the sources of those biases” (Sterelny, 2001, p. 848); “there is a  
104   certain tautology here” (Whitehouse, 1996, p. 102); and “[I]f intrinsic appeal is whatever

105 explains the persistence of long-lived behavioural lineages..., and long-lived behavioural  
106 lineages are defined in terms of intrinsic appeal, then we have moved in a very tight, and  
107 empirically vacuous circle” (Buskell, 2016, p. 438)<sup>1</sup>.

108           These worries are very reminiscent of a concern sometimes expressed about the  
109 theory of natural selection, and the corresponding notion of ‘fitness’. What is fit? Organisms  
110 that survive. Which organisms survive? Those that are fit. Karl Popper expressed this view:  
111 “The trouble about evolutionary theory is its tautological, or almost tautological, character:  
112 the difficulty is that Darwinism and natural selection, though extremely important, explain  
113 evolution by the ‘survival of the fittest’ (...). Yet, there does not seem to be much difference,  
114 if any, between the assertion ‘those that survive are the fittest’ and the tautology ‘those that  
115 survive are those that survive’. For we have, I am afraid, no other criterion of fitness than  
116 actual survival, so that we conclude from the fact that some organisms have survived that  
117 they were the fittest, or those best adapted to the conditions of life.” (Popper, 1972, p. 242)

118           This is, of course, just a high-profile example of a historically common  
119 misunderstanding. The matter has by now been addressed often, and with near unanimity.  
120 Here is one version of the rebuttal: “No reputable biologist accounts for an evolutionary  
121 development [just] by asserting the principle of natural selection – as if it were enough to  
122 say “It’s the survival of the fittest again”. Instead, each time the concept of fitness is  
123 employed in evolutionary explanations, biologists are compelled to advance some  
124 independent, empirically vulnerable, claim about the advantage conferred by a particular  
125 characteristic under particular circumstances... [E]volutionary biologists are not in the habit  
126 of declaiming *ad nauseam* that those who survive survive.” (Kitcher, 1982, p. 60)

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<sup>1</sup>For the sake of clarity, note that the use of “intrinsic appeal” in this final quotation – rather than, say, ‘attractiveness’ – is because the specific target of discussion is Olivier Morin’s book *How Traditions Live & Die* (2016), which coins and makes use of intrinsic appeal as a gloss of the ideas of CAT. It is very clear from the wider context that CAT is the target of discussion.

127           Much the same applies here. Each time the concepts of attractors and attraction are  
128 employed, what is also required is some independent, empirically vulnerable claim about  
129 why the adjustments and transformations that occur in the acquisition and expression of the  
130 cultural items are likely to be biased in particular directions, and not others. In short,  
131 attraction is *explained* by specifying what factors actually cause it. Cultural attraction  
132 theorists have been clear about this: “attractors and the process of attraction... do not  
133 provide explanations of cultural phenomena. Attraction should instead be explained in terms  
134 of factors of attraction” (Claidière et al., 2014, p. 7). Cultural attraction theorists are not in  
135 the habit of declaiming *ad nauseam* that those distributions of cultural items that change,  
136 change; or indeed that those that are stable, are stable – as if it were enough to say “It’s  
137 cultural attraction again”.

138           In the example above, of gaze direction in portraits, there was an independent,  
139 empirical vulnerable claim, about how the human visual system processes faces in a way  
140 that will, over time, change the distribution of cultural items in a population in the observed  
141 way. So in this case the relevant factor of attraction – the explanans – is the human  
142 preference for direct eye gaze. Here is another proposed case. Genetically modified (GM)  
143 food is often opposed on grounds of health risk, despite no scientific evidence of such risk,  
144 and despite its potential to contribute to sustainable forms of agriculture (e.g., Kluemper &  
145 Qaim, 2014). Researchers making use of the insights of CAT have recently proposed an  
146 explanation of this phenomenon, based upon an independent, empirically vulnerable claim,  
147 about the psychological factors that impart a causal influence on the cultural transmission of  
148 beliefs about GM technology (Blancke et al., 2015). The specific claim is that the idea of  
149 genetic modification runs counter to humans’ intuitive biology in several important ways, in  
150 particular our natural dispositions towards essentialist and teleological ways of thinking

151 (Gelman, 2004; Kelemen, 1999). This observation might help to explain why individuals  
152 might be more likely to hold anti- rather than pro-GM opinions, and why beliefs about GM  
153 foods might be expressed and understood in sceptical ways. What CAT adds to that picture is  
154 (the outlines of) a causal description of how individual-level phenomena such as this scale up  
155 to the population level.

156         So here too, as with the portraits example above, there is an independent, empirical  
157 vulnerable claim – about the effects of human intuitive biology on beliefs about GM food –  
158 which is being coupled with CAT to help explain a population level phenomenon, namely  
159 widespread rejection of GM technology. Now, the specific empirical claim here – or indeed  
160 in any case – may or may not be true, but that is not the point. The point is rather that the  
161 proposed explanation is based upon just such an empirical vulnerable claim. This entirely  
162 alleviates any supposed circularity.

163

### 164         **3. Factors of attraction are not just psychological**

165

166         In both the examples given above (direct-gaze portraits, and continued opposition to  
167 GM technology), cultural persistence, stability and success were explained, in part, by  
168 reference to psychological factors: preferential attention in one case, intuitive biology in the  
169 other. And indeed, the idea of attraction has usually been illustrated with examples of this  
170 sort, where the relevant factors of attraction are psychological in character (e.g. Blancke et  
171 al., 2015; Boudry et al., 2015; Boyer, 1994, 2001; Boyer & Petersen, 2012; Miton et al., 2015;  
172 Morin, 2013). In consequence, factors of attraction are sometimes understood to be  
173 psychological as a matter of definition, and the thesis of cultural attraction is  
174 correspondingly read as a thesis about how cognitive factors affect the distribution of



175 cultural items. This reading is, in particular, implicit almost everywhere that most other  
176 cultural evolutionists discuss attraction (e.g. Henrich & McElreath, 2003; Caldwell et al.,  
177 2016; Henrich et al., 2008; Gil-White, 2008; Henrich & Boyd, 2002; Laland & Brown, 2011;  
178 *inter alia*). Some readers have interpreted attraction to be, even more narrowly, the effects  
179 of only those aspects of the mind that are evolved, universal psychological dispositions.

180         From its inception, CAT has identified not only psychological but also ecological  
181 factors as causal components of any explanation of culture. Where the phrase ‘factors of  
182 attraction’ was first coined, the relevant subsection is entitled “Ecological and psychological  
183 factors of attraction” (Sperber, 1996, p. 113). Subsequent publications have repeatedly  
184 made the same distinction, and at times even clarified possible misunderstanding: “The  
185 epidemiological approach insists on the fact that the causal chains of cultural distribution  
186 are... cognitive *and* ecological processes that extend over time and across populations”  
187 (Sperber & Hirschfeld, 1999, p. cxxiv; italics in original); “Factors of attraction can be of  
188 different kinds. At the most general level, they may have to do with psychological  
189 dispositions or with environmental constraints and affordances... it has never been part of  
190 the theory that factors of attraction should be exclusively cognitive” (Claidière & Sperber,  
191 2007, p. 92).

192         The distinction here is, roughly, a distinction between factors internal to the mind  
193 (such as, in the example above, the evolved tendency to pay greater attention to direct  
194 gaze), and those external to it (such as, say, the portraits displayed in a given social  
195 environment at a given historical time). We will expand on this distinction shortly, but let us  
196 first make a couple of asides about the reasons why cultural attraction has often been  
197 interpreted as a thesis just about the role of psychological factors in cultural change and  
198 stability, even if it was never intended as such.

199 First, the literature on cultural attraction has provided more specific examples of  
200 psychological factors of attraction than ecological ones, and, moreover, these examples have  
201 tended to be evolved, universal aspects of the mind, which, because of their developmental  
202 invariance, tend to channel culture in particular directions. The two examples given in the  
203 previous section are of this type. Ecological factors have certainly not been absent from the  
204 literature, especially in the key texts – see, for instance, chapter 3 of *Explaining Culture* (first  
205 published as Sperber, 1985), which discusses the impact of writing on the flow of cultural  
206 information – but it is true that the idea of attraction has been most often illustrated with  
207 psychological factors, and most of these have been evolved, universal factors.

208 A second reason why CAT has sometimes been understood as a thesis just about the  
209 role of cognition in cultural change is that there is indeed some degree of inconsistency in  
210 the existing literature. Some cultural attractionists, and others partially sympathetic to CAT,  
211 use the phrase cultural attraction, or propose to use it, in the more narrow, restricted sense,  
212 to describe the effects that evolved, universal aspects of the mind have upon the form and  
213 distribution of cultural items (Acerbi & Mesoudi, 2015; Morin, 2016a). Such factors are, after  
214 all, the most likely candidates for leaving an observable trace on long-term cultural history  
215 (Morin, 2016a). One important paper in this context is Nicolas Claidière and Dan Sperber’s  
216 2007 model, which adopted the more narrow usage for strategic reasons, as a way to  
217 engage with the 2002 paper of Joe Henrich and Rob Boyd, which used the term attraction in  
218 the same way (Sperber, personal communication)<sup>2</sup>. This is, however, not how the terms  
219 were originally conceived. In this paper we stick to the original, more general notions (see  
220 also §5, below).

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<sup>2</sup> Claidière and Sperber pursue this strategy – of adopting the terminologies of other cultural evolutionists as a means of engagement – in some other papers too, in particular their 2008 comments on Richerson and Boyd’s 2005 book, *Not By Genes Alone*.

221           Let us now expand on the distinction between psychological and ecological factors,  
222 and the contributions they make to cultural dynamics. Psychological factors are cognitive  
223 competencies, preferences and dispositions, and also both currently and previously held  
224 beliefs, acquired skills, know-how, memories, and other psychological phenomena that  
225 affect whether and how a cultural item is processed by its host. In other words: all those  
226 aspects of cognition that contribute to the generation, expression, acquisition, and  
227 persistence of cultural items. Such factors are many and varied. Some, such as a preference  
228 for direct eye gaze, are evolved human dispositions, with very little if any developmental  
229 invariance. Others are caused, to varying extents, by previous processes of enculturation and  
230 scaffolding. You can, for instance, only learn to read if you already know the alphabet, you  
231 can process a sentence in French only if you already know that language, and you can more  
232 easily learn how to build a canoe if you already know what each part is made for.

233           Ecological factors are, in contrast, those factors in the local environment of the mind  
234 that are relevant to cultural dynamics. Like psychological factors, they too are many and  
235 varied. They include the biological and physical environment external to the organism (food,  
236 materials), and also the existing pool of cultural items in the population at large, including  
237 mental representations held in the minds of other individuals. Sperber and Claidière give  
238 several specific examples: “What may cause a stew recipe to evolve is the local availability of  
239 ingredients and possible substitutes. Higher population density with the increased  
240 availability of the expertise of others buttresses folk-knowledge, protects it from the risk of  
241 drift, and allows it to complexify. Hard-to-remember narratives nevertheless reach a cultural  
242 level of distribution when writing provides an external memory. Complex calculus is much  
243 more commonly performed and has a greater cultural impact when it can be handled by  
244 computers” (Sperber & Claidière, 2008, p. 288).

245 Both types of factor include within them a graded distinction between global and  
246 local factors (Morin, 2016a). Strongly global factors are those that apply more-or-less  
247 universally, while local factors are specific to a small group of individuals. The human  
248 preference for direct gaze is a global psychological factor, while one family's shared  
249 knowledge of its own dynamics is a local psychological factor. The 24-hour day is a global  
250 ecological factor, while the prevalence of a particular plant species in the local environment  
251 is a local ecological factor. This distinction between global and local factors is one of degree.  
252 As suggested above, most of the present literature on cultural attraction has focused on  
253 global psychological factors, but of course all these different types of factor contribute to the  
254 frequency and stability of cultural items, and indeed interplay with each other in highly  
255 contingent ways (Heintz, 2009, 2013; Morin, 2011; *inter alia*).

256

#### 257 **4. CAT is not the same as other approaches to cultural evolution**

258

259 CAT is an evolutionary approach to culture: it argues that it is useful and insightful to  
260 study culture as a population of items of different types, with the frequency of types  
261 changing over time (Sperber, 1996; Claidière et al., 2014). Advocates and architects of other  
262 evolutionary approaches to culture have sometimes urged closer integration of CAT and  
263 these other approaches, and/or questioned what CAT has anything to offer above and  
264 beyond what these other approaches have already established: "Cultural attraction seems  
265 little different to the notion of cultural evolution presented by Cavalli-Sforza and Feldman  
266 (1981), Boyd and Richerson (1985), and others" (Acerbi & Mesoudi, 2015, p. 488).

267 Cultural attractionists have, in contrast, insisted on maintaining a distinction between  
268 CAT and these other approaches to cultural evolution. Here we explain some of the key

269 reasons for this (see also Morin, 2016b). We do not aim at exhaustive comparison. That  
270 would be beyond the scope of this article (relevant discussion can be found in Acerbi &  
271 Mesoudi, 2015; Buskell, 2016; Lewens, 2015; Sterelny, 2017). Nor do we intend to review or  
272 recapitulate arguments made in previous papers, regarding the relative merits of different  
273 approaches (see instead Acerbi & Mesoudi, 2015; Claidière & Sperber, 2007; Claidière &  
274 André, 2012; Claidière et al., 2014; Henrich & Boyd, 2002; Henrich & McElreath, 2003;  
275 Lewens, 2015; Morin, 2016a; Richerson & Boyd, 2008; Sperber & Claidière, 2006). Our goal  
276 is, rather, just to show that CAT is different to other approaches to cultural evolution, and  
277 indeed different in ways that matter. We focus on three issues in particular.

278

#### 279 4.1 *CAT aims at partially different goals to much other work in cultural evolution*

280 A first difference, independently noted in some recent book reviews, is that the main  
281 objectives of CAT are different to those of many other cultural evolutionists (Scott-Phillips,  
282 2016; Sterelny, 2017). Rob Boyd and Pete Richerson are two key figures in the field of  
283 cultural evolution. They were both originally trained in biology, and detailed reading of their  
284 work shows that their primary goals remain biological ones: to use an evolutionary approach  
285 to explain human adaptation. They conclude that culture itself aids human adaptation (see  
286 in particular Henrich, 2016). In developing this thesis they have made important  
287 contributions to the anthropological goal of explaining culture itself, but this is, we surmise,  
288 not their foremost concern. In contrast, the main objective of CAT is to explain why cultural  
289 items take the forms that they do, regardless of whether they foster adaptive behaviour or  
290 not. The main project of CAT is to explain culture itself (Sperber, 1996).

291 These two projects – explaining adaptation and explaining culture – are of obvious  
292 relevance to one another, and indeed are interdependent to some significant extent. Both

293 groups of scientists have made important contributions to both goals. Nevertheless it is still  
294 useful, when comparing these two schools of thought, to keep in mind that they approach  
295 and frame the issues from subtly different starting points, and are engaged with them for  
296 subtly different reasons. By way of illustration, consider this comment, made by Richerson in  
297 his recent review of Morin’s book: “adaptation to local environments in time and space is...  
298 what cultural evolution is all about” (Richerson, 2017). This is indeed what cultural evolution  
299 is all about for Richerson and many of his collaborators, but it is not what cultural evolution  
300 is all about for CAT theorists, and some other cultural evolutionists too. CAT considers itself  
301 an evolutionary approach only and exactly because it takes a populational approach to the  
302 study of culture (Claidière et al., 2014).

303

#### 304 4.2 *CAT rejects causal separation of transmission and change*

305 A second difference between CAT and other approaches to cultural evolution  
306 concerns the exact role of cognition in explanations of culture.

307 Inspired as they are by the analogy with biological evolution, most approaches to  
308 cultural evolution stick relatively close to the biological model, where there is a generally  
309 clear distinction between, on the one hand, the mechanisms of gene proliferation, and on  
310 the other hand the environmental factors that determine the relative success of different  
311 genes. Most approaches to cultural evolution adopt a correspondingly similar taxonomy. For  
312 example: “We divide the evolving system into two parts. One is the ‘inertial’ part – the  
313 processes that tend to keep the population the same from one time period to the next... The  
314 other part consists of the forces – the processes that cause changes in the numbers of  
315 different types of cultural variants in the population” (Richerson & Boyd, 2005, p. 68);  
316 “cultural evolution depends on two processes, innovation and imitation, that must take

317 place in a dialectical process over time such that one step in the process enables the next”  
318 (Tomasello, 1999, p. 39).

319 This two-part ontology is implicit in much of the cultural evolution literature  
320 (Charbonneau, 2015). The clearest illustration of this is in formal models, many of which  
321 instantiate some version of the distinction between mechanisms of transmission and forces  
322 of change; but it is also present in the empirical research agenda, where a great deal of  
323 attention is paid to the discovery and description of psychological mechanisms capable of  
324 ‘copying’ at levels of fidelity high enough to sustain cultural stability, as DNA does in the  
325 biological case (e.g. Caldwell & Millen, 2009; Tomasello et al., 1993; Tomasello, 2016; inter  
326 alia). Indeed, some researchers have even predicted the future discovery of a cultural  
327 equivalent of DNA: “The cultural ‘Watson and Crick’... are likely to be neuroscientists, looking  
328 at how information is stored in the brain” (Mesoudi et al., 2004, p. 9).

329 This presumed distinction between mechanisms of transmission and forces of change  
330 in turn motivates a research agenda in which enquiry into these two aspects of evolution can  
331 be essentially de-coupled, and research into evolutionary dynamics can proceed “through  
332 functional considerations [alone] without any commitment to mechanism” (Hoppitt &  
333 Laland, 2013, p. 200). “[W]e can black-box the problem of how culture is stored in brains by  
334 using plausible models based on observable features that we do understand, and forge  
335 ahead” (Richerson & Boyd, 2005, p. 81). This approach has been highly profitable in the  
336 biological case, where it goes by the name of the ‘phenotypic gambit’ (coined in Grafen,  
337 1984). A large part of the justification for this investigative strategy derives from the fact  
338 that there is indeed a causally clear distinction between mechanisms of gene proliferation  
339 (genetics) and the environmental factors that determine the relative success of different  
340 genes (ecology) (*ibid.*).

341           What CAT has observed and described, many times over, is that *this causal*  
342 *separation just does not hold in the cultural case* (Claidière & André, 2012; Claidière et al.,  
343 2014; Scott-Phillips, 2017; Sperber, 1996, 2000; Sperber & Claidière, 2006; inter alia). The  
344 causes of transmission and the mechanistic details of how that transmission happens are, *in*  
345 *the cultural case*, and unlike the biological case, fundamentally intertwined: “cultural  
346 contents are not replicated by one set of inheritance mechanisms and selected by another,  
347 disjoint set of environmental factors – not by a long shot... the causal forces involved cannot  
348 be neatly separated into reproductive mechanisms and environmental factors” (Sperber &  
349 Claidière, 2006; see also Heyes, 2016 for related arguments). The point is not simply that  
350 causal explanation of culture *is incomplete* without engagement in the cognitive details, it is  
351 that causal explanation *is made impossible* if we insist on an unnatural separation between  
352 mechanisms of transmission and factors of change.

353           Moreover, the processes at work in cultural transmission are not the same for all  
354 types of cultural items. For instance, face recognition will have a role in the transmission of  
355 mask making practices, but not in the transmission of agricultural technologies. Of course,  
356 some processes are of huge relevance and pervasive importance – the obvious example is  
357 ostensive communication – but no particular process applies in general. There is, in  
358 consequence, no general theory of cultural transmission (just as there is no general theory of  
359 medical epidemiology), but only explanations specific to each cultural phenomenon. In  
360 consequence, proper causal explanation of the emergence and stability of cultural items –  
361 which is, as we summarised above, the ultimate objective of CAT – can only be achieved if  
362 researchers specify the particular processes at work in a given case. Yet this possibility is  
363 precluded if researchers pursue an investigative strategy akin to the phenotypic gambit, in  
364 which the details of transmission are treated as causally separate to factors of change.



365           These arguments are some of the key reasons why CAT theorists have persistently  
366 refused to adopt the same investigative framework as other cultural evolutionists. They are  
367 also, incidentally, why many cultural attractionists also study communication,  
368 argumentation, selective trust, and other aspects of cognition involved in social transmission  
369 (e.g. Mercier & Sperber, in press; Morin, 2016a; Scott-Phillips, 2014; Sperber & Wilson, 1995;  
370 Sperber et al., 2010).

371

#### 372 4.3 *CAT conceives of culture itself in a different way to other cultural evolutionists*

373           A third difference is ontological. Other approaches to cultural evolution tend to treat  
374 culture as an entity, defined in terms of information. For instance: “Culture is information  
375 capable of affecting individuals’ behavior that they acquire from other members of their  
376 species through teaching, imitation, and other forms of social transmission” (Richerson &  
377 Boyd, 2005, p. 5), “Culture is... information transmitted between individuals or groups,  
378 where this information flows through and brings about the reproduction of, and a lasting  
379 change in, the behavioral trait” (Ramsey, 2013, p. 476) (see Driscoll, in press; Lewens, 2015  
380 for discussion). These approaches share with most standard anthropological approaches an  
381 assumption that a culture is an ensemble of ideas, skills, norms, practices, artefacts – and,  
382 hence, that whether a given item is or is not cultural is a yes-no question.

383           Cultural attractionists, and some others too, have argued that such definitions  
384 produce both false positives and false negatives: they map onto many phenomena that are,  
385 by general consensus, not cultural; and/or they do not map onto some phenomena that are  
386 (Driscoll, in press; Lewens, 2015; Morin, 2016a; Sperber & Claidière, 2008). To take just a  
387 trivial example, suppose that Alice tells Barry that there is a book on the table. This  
388 knowledge, about the location of the book, fits most mainstream definitions: it is

389 information passed from one individual to another by means of social transmission. We and  
390 other CAT theorists are skeptical: to call this knowledge culture, and hence to use the same  
391 label for it as more quintessential examples (such as, say, knowledge of marriage  
392 rituals) seems to us to miss the point of what makes culture an empirical phenomenon  
393 worthy of study.

394 Cultural attraction theorists argue instead that the natural character of culture is not  
395 as a thing, or even a collection of things, but rather a *graded property* that things can have,  
396 to a greater or lesser degrees. It does not have any natural ontology of its own. Some mental  
397 states, behaviours and artefacts are highly cultural, and others less so (Sperber, 1996, p. 49;  
398 Sperber & Claidière, 2008). To be more specific, mental and public items have the property  
399 of being cultural *to the extent that social transmission shapes them, and explains their*  
400 *persistence in a population* (see Morin, 2016a; Sperber, 1996, 2011; Sperber & Claidière,  
401 2008 for further details).

402 As an example, consider chewing. Although it is a natural behaviour, it is still cultural  
403 to a limited degree, albeit not too much. That is to say: it is sometimes performed or  
404 inhibited differently across cultures, most obviously because some cultures proscribe that  
405 chewing should be done with the mouth closed. In contrast, saying “Bon appétit!” before a  
406 meal is a practice much more shaped and stabilised by cultural transmission. As such the  
407 difference between chewing and saying “Bon appétit!” is a difference of degree and not  
408 kind. It is not that one of these is a cultural thing and the other is not; instead, one is just  
409 more cultural than the other. CAT theorists believe that this approach carves the relevant  
410 phenomena in more fine-grained manner, closer to its natural character, than do other  
411 approaches, evolutionary or otherwise.

412

413 **5. Cultural attractors are not concrete entities**

414

415 As described above, cultural phenomena are, within CAT, items much shaped and  
416 stabilised by social transmission. This specification of culture in turn gives rise to the related  
417 notions of cultural attractors and cultural attraction – but these ideas have been glossed in  
418 some subtly different ways, by cultural attractionists themselves, and others too, and this  
419 has led to some degree of ambiguity and misunderstanding (Buskell, 2017). In this section  
420 we describe what cultural attractors are, and what they are not. In particular, we address  
421 the persistent misreading that attractors are physical, concrete objects, with causal effects.

422 It may be useful to begin with an example. Each different rendering of the story of  
423 Little Red Riding Hood – and even more, each memory trace it leaves in the mind of all the  
424 people who have heard and remembered the tale – is, typically, slightly different from the  
425 next. However, if we abstract away from these individual instances, but keep in focus their  
426 relative resemblance, general patterns and features can be described. Correspondingly, talk  
427 about the ‘story’ of Little Red Riding Hood is, typically, talk about what all concrete instances  
428 of its telling can be seen to approximate, to some greater or lesser degree. When we speak  
429 of “Little Red Riding Hood”, we refer not to an actual token of the tale, but to an abstracted  
430 type, around which all actual versions cluster.

431 Some items are typically recognised as tokens of the same cultural type: different  
432 renderings, for instance, of the same tale. Even if each specific token can and often does  
433 differ from it in one way or another, so long as the family resemblance remains, the  
434 population of cultural items can be identified as items of the same cultural type (a specific  
435 tale, dish, piece of music, word, ritual, social status, and so on). When this is so, the  
436 abstracted type is an attractor. In other words, attractors are not concrete objects, but

437 abstractions based on statistical distributions. They are *abstracted idealisations of what a*  
438 *collection of tokens share in common*. No particular telling of Little Red Riding Hood is an  
439 attractor, and nor can it be; but an accurate abstraction of the tale, derived from multiple  
440 actual tellings, is. Of course, a particular token can correspond very closely or even exactly to  
441 the abstracted version, but that still does not make the token an attractor. The attractor is  
442 the abstracted type, of which the particular token is but one manifestation. Figures 1 and 2  
443 provide a graphic illustration of attraction and attractors.

444 [Figures 1 and 2 about here]

445 Identification of an attractor is, correspondingly, a matter of empirical discovery and  
446 description. Quite often attractors can be identified by members of the relevant cultural  
447 group themselves, as in the case of Little Red Riding Hood. At other times scientific  
448 observation and analysis is required. Grammars, for instance, are often opaque even to  
449 those that hold them (native speakers of a language are rarely able to describe its  
450 grammatical rules in any detail). So too for many other cultural phenomena. Even if they do  
451 much use this terminology themselves, it is one of the primary, self-set goals of both  
452 ethnography and linguistics to identify and describe cultural attractors in as much detail and  
453 richness as possible, and also to identify and track changes in the attractors themselves over  
454 deep, historical time (see e.g. Tehrani, 2013 on the example of Little Red Riding Hood).

455 Identification of an attractor does not and cannot do any explanatory work in and of  
456 itself. As we said, attractors are not concrete things, and as such they do not have causal  
457 powers – and in particular they do not literally ‘attract’ anything. The notion of an attractor  
458 is, rather, a descriptive notion, and so what identification and description of an attractor  
459 does is to provide a (hopefully) helpful description of what needs to be explained. As we

460 suggested in §2, and again in §4.2, a proper causal explanation can come only from  
461 identification of the *factors* that cause attractors to emerge and be stable.

462 In this respect an attractor is comparable to, say, a centre of gravity. A centre of  
463 gravity is not itself causally active, but the identification of a centre of gravity is hugely  
464 helpful to proper causal description of the dynamics of moving bodies. Similarly, an attractor  
465 is not itself causally active, but identification of an attractor can be useful for the description  
466 of cultural dynamics, and for their subsequent causal analysis. Neither centres of gravity nor  
467 cultural attractors provide causal explanation, but both provide explanatory purchase on  
468 their relevant domains of enquiry.

469

## 470 **6. Conclusion**

471

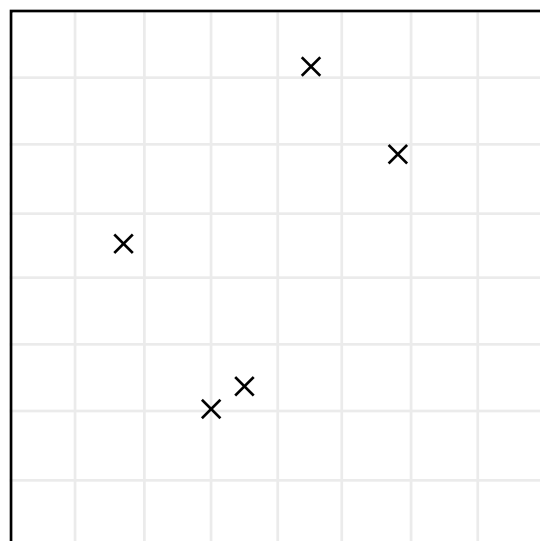
472 Our overriding goal in this paper has been to identify common misunderstandings  
473 and misreadings of CAT, and by this means to respond to some specific, recurring critiques.  
474 We conclude that existing critiques have not identified any issues that demand fundamental  
475 revision of CAT.

476 We have focused in particular on the notions of culture, cultural attractor, and  
477 factors of attraction, since these have been the most discussed in commentary. However, no  
478 reader should conclude that these notions represent the whole of CAT's theoretical tools. By  
479 way of illustration, let us briefly bring attention to the important idea of a cognitive causal  
480 chain (CCC): roughly, a chain of causal events in which each link includes a cognitive  
481 dimension as either cause or effect (Heintz, in press; Sperber, 2001, 2011; Sperber &  
482 Hirschfeld, 1999, 2007). Social CCCs are CCCs that extend over multiple individuals, and  
483 cultural CCCs are CCCs that shape and stabilise cultural items over extended periods and

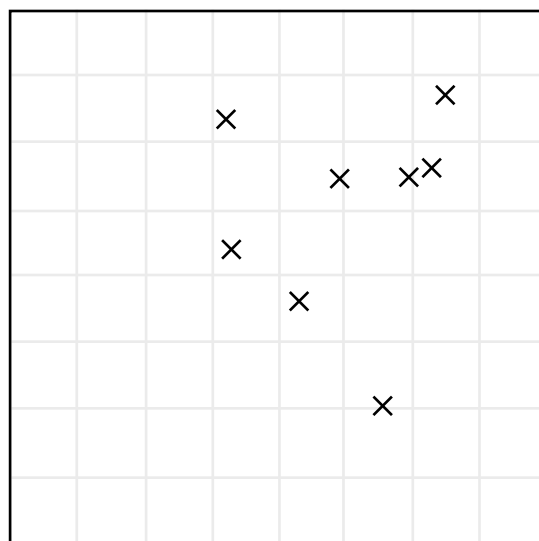
484 many individuals. (This idea of a cultural CCC is, incidentally, closely related to the definition  
485 of culture that we outlined in §4.2, above.) Here is, of course, not the place to enter into  
486 detailed discussion or exposition of CCCs (see instead e.g. Sperber, 2011) – we mention them  
487 instead just to show, with a specific example, that CAT is not at all comprised only of those  
488 ideas on which we have focused in this article. There is a great deal of further richness  
489 already in CAT, and many opportunities for further development too, both theoretical and  
490 empirical.

491           One key theoretical opportunity is formal (mathematical) description of CCCs,  
492 attraction, and attractors. This is a difficult problem, for many reasons – in particular those  
493 we touched on in §4.3, that cultural causality is both highly promiscuous and highly  
494 contingent – but it is well worth pursuing. On the empirical side, the richest work will not  
495 only identify, for a given case, *what* the relevant factors of attraction are, but also specify  
496 *how* those factors have their effects. That is to say, it will identify the cognitive chains  
497 through which factors of attraction have their causal effects. We hope that the clarification  
498 we have aimed for in this article will support this goal.

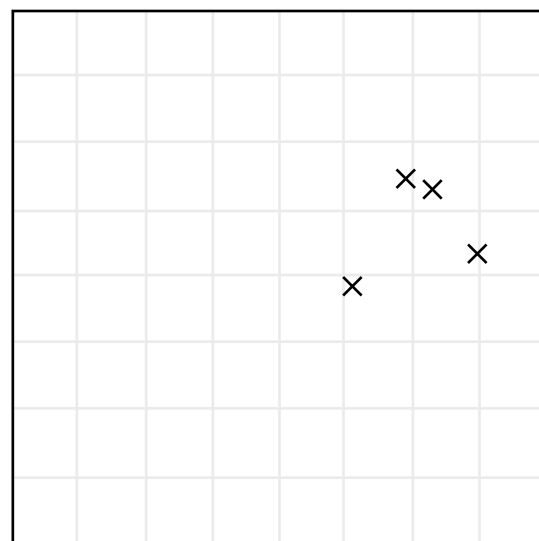
499



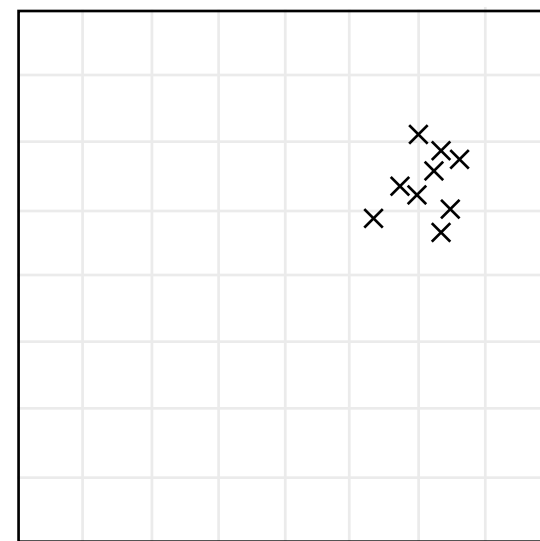
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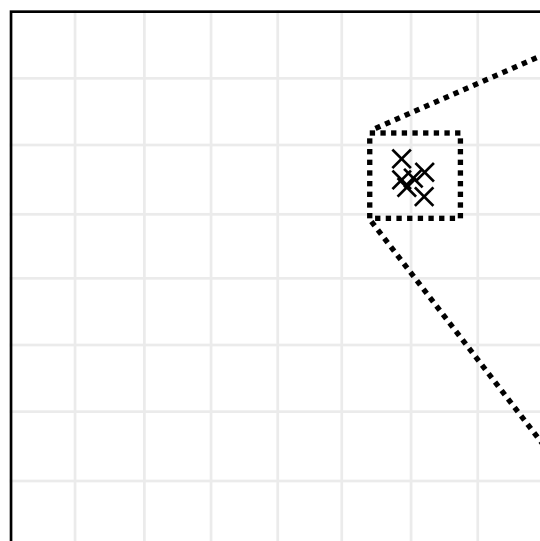
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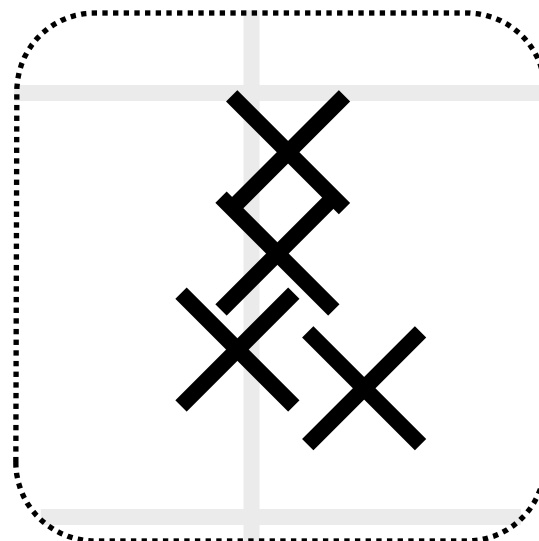
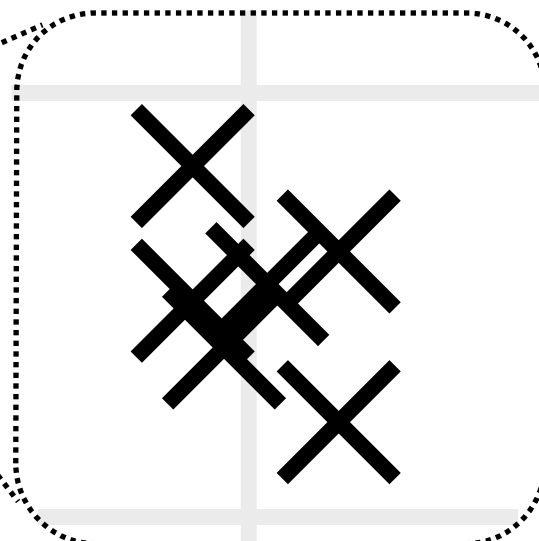
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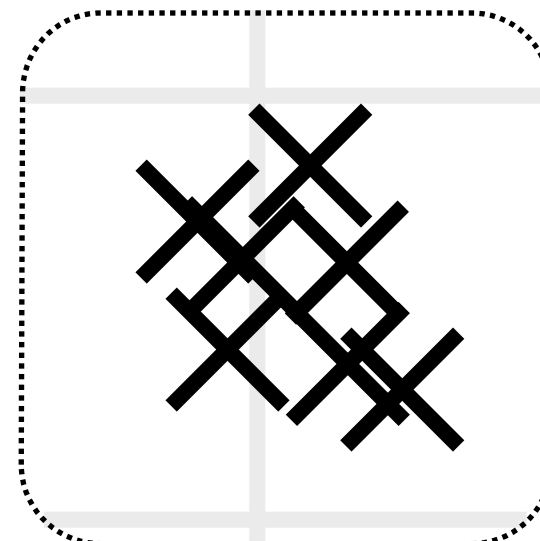
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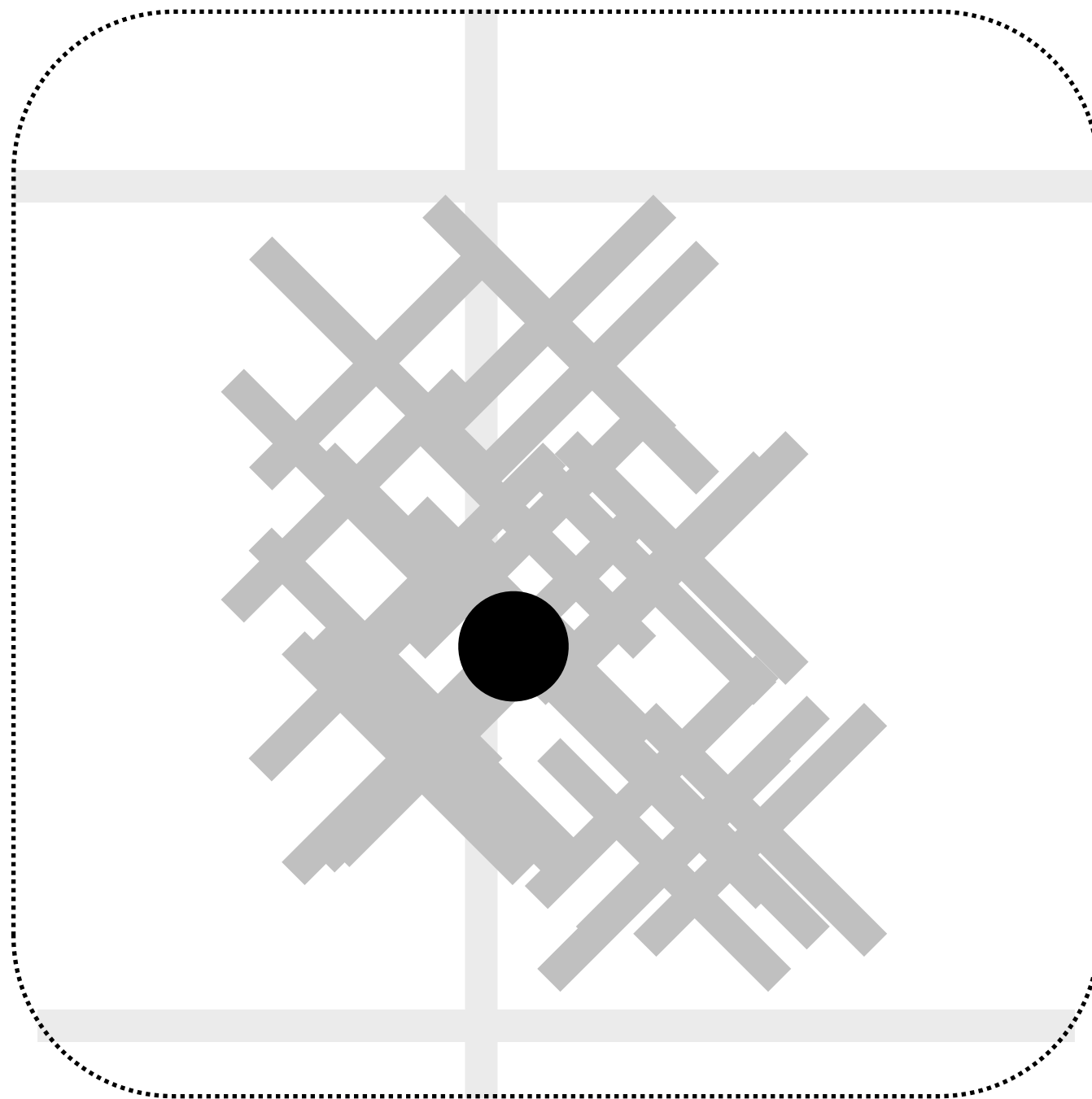
$t = 4$



$t = 5$



$t = 6$





500 **Figure legends**

501

502 *Figure 1: Cultural attraction.* Crosses depict cultural items within a two-dimensional space of  
503 possible items, over seven different time steps. At each time step, the population of items  
504 can be observed to move in the direction of (time steps 0 to 4), and then remain stable  
505 around (time steps 4 to 6) a particular point in the space. Note that (i) the number of tokens  
506 can vary from one generation to the next; and (ii) stabilisation does not need to involve like-  
507 for-like copying: all that is required is that the tokens at one step produce, in the next time  
508 step, tokens that tend to cluster in the same portion of the overall space.

509

510 *Figure 2: A cultural attractor.* Grey crosses depict all the tokens observed at time steps 4, 5  
511 and 6 i.e. after stabilisation has been reached i.e. when the tokens can indeed be identified  
512 as tokens of a type; see main text for discussion. The abstracted idealisation of what all  
513 these tokens share in common – the attractor – is identified, in this two-dimensional  
514 characterisation, as the mathematical centroid of the tokens, and depicted as a black circle.

515

516 **Acknowledgments**

517 We thank Alberto Acerbi, Mathieu Charbonneau, Helena Miton, Dan Sperber, and members  
518 of the Centre for the Coevolution of Biology & Culture, at Durham University, for valuable  
519 comments on earlier drafts. TSP was supported in this work by funding from Durham  
520 University's Addison Wheeler bequest, and from the European Research Council, under the  
521 European Union's Seventh Framework Programme (FP7/2007-2013) / ERC grant agreement  
522 n° 609819 (Somics project). SB was supported by Ghent University (BOF13/24J/089).

523

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