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Forever united: the co-evolution of language and normativity

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19.1 Introduction

Language and norms are both fundamental to human society. A social account of language evolution must take into account the normative context in which language acquisition, use, and change occur. However, at the same time, norms in human society are directly affected by language and the linguistic skills of individuals. My aim in this chapter is to explore the evolutionary consequences of this bi-directional interaction. I will discuss how it can help explain central linguistic notions including imperatives, questions, possessives, modal vocabulary, categorization, and performatives, and how it helps explain unique features of human normativity.

Norms delimit or determine appropriate or proper behaviour in a given context, and social life is governed to a large extent by a pervasive normative structure. Loosely speaking, norms can be defined as principles or rules that determine what behaviour is appropriate, required, permissible, or forbidden (see Sripada and Stich 2006).[1] I use the term *normativity* to refer to the capacity to acquire and implement norms. While norms may be acquired by experiencing or observing behaviours that lead to sanctions, they need not be, and in general are not. Moreover, norms enjoy what Sripada and Stich call *independent normativity*: they do not depend on other social institutions nor on sanctions to endow them with their force (see Tomasello 2009). Importantly, norms have motivational consequences: people are motivated to comply with norms they have acquired as ultimate ends and to justify and defend them when the need arises. Sripada and Stich call this type of motivation *intrinsic motivation* and note that violations of norms often lead to punitive attitudes and

[1] This characterization should not be understood as committing us to any particular account regarding the way in which norms are stored or represented cognitively.

emotions, such as anger, condemnation, and blame. These two properties indicate the dual nature of social norms: they are social level facts yet they play a fundamental, irreducible role in individual psychology. This is a crucial property of the phenomenology of human normativity. Somewhere along the way, both ontogenetically and phylogenetically, humans come to recognize some reasons as having a normative force that goes beyond that of prudential reasons of the sort that ground instrumental adherence to social conventions, such as driving on the right side of the road (see Bicchieri 2006: 13). A significant aspect of the intrinsic motivation established by a norm is that individuals judge the norm itself as appropriate and employ deontic reasoning to justify it as well as its application in a given context. Many norms are implicit and people obey them unreflectively, of course, but reflection on and attempts to justify norm-governed behaviour as well as of the norms themselves can be induced (Brandom 1994). I take it that an evolutionary account of normativity has to be true to all these phenomenological details. I will argue that the evolutionary interaction between language and normativity helps explain the transition from social enforcement of norms to self-commitment and intrinsic motivation.

Many norm-governed social institutions assist children in the acquisition of language. Moreover, many aspects of language use are normative, for example: (1) symbolization, which involves accepting arbitrary signs as appropriate labels; (2) most pragmatic phenomena, such as speech acts (Dore 1974, 1975), grasping communicative intent, and displaying conversational skills (e.g. turn-taking, handling interruptions); and (3) understanding the normative context of discourse, which can transform questions into commands, requests into demands, and so on (see Labov 1972: 255ff).

Language use is thus clearly affected by the normative background and the normative skills of speakers, yet, reciprocally, norms are affected by language. Acquiring social norms is often affected by linguistic cues (e.g. 'Only women are allowed to go inside.', 'You shouldn't do that!', 'Why did you do that?!') and thus by the explicitly normative vocabulary and categories that are available (e.g. 'must', 'ought', 'may', 'allowed'). Explicit normative or deontic reasoning (and deliberation) is linguistic, not only in adults but in pre-school children (e.g. Harris and Núñez 1996; reviewed in Beller 2009), and through it language affects norm acquisition, maintenance, and enforcement. In addition, various speech acts such as promises commit the speaker to certain permissible and required actions (Austin 1962).

Thus, language affects the normative capacity of individuals and the kinds of norms that can be established, while norms and the normative capacities of individuals affect language acquisition and use. This bi-directional interaction, I will argue, leads to co-evolutionary dynamics that are important for understanding both of these fundamental human abilities. First, however, I will consider how normativity and language are intertwined developmentally.

19.2 Co-developmental evidence

From two to three years of age, children experience a dramatic explosion in linguistic ability as well as a similarly dramatic expansion of normative or deontic performance (Schmidt et al. 2011; Casler et al. 2009; Rakoczy et al. 2008; Cummins 1996; Harris and Núñez 1996). The psychological evidence on deontic reasoning is reviewed in Beller (2009). To explore how normativity and language might have interacted evolutionarily, let's first take a look at how their interactions manifest developmentally and ask how children acquire the competencies underlying the rule-governed employment of language in society. This is the realm of developmental pragmatics.

The following tale illustrates the development of normative pragmatics in a prelinguistic child and indicates some ways in which normativity in general, normative pragmatics, and language are interrelated. I turn to evolutionary implications in the next section. Each case described below seems *prima facie* to involve normativity of a specific kind, for example the acquisition of norm-governed rituals, paradigmatic social interactions, and social justification of behaviour. The majority of behaviours are prior to full language, and two years of age, most of them much earlier (though I mostly focus on developments between 18 and 23 months of age) and before the regular use of assertion statements and connected discourse.[2]

Like most children, our protagonist, call her Dora, used pointing behaviour by the time she was 12 months old (see Tomasello 2009). This is a form of joint attention and information sharing. Various studies have indicated that preverbal children exhibit a variety of pragmatic behaviours, including requests of various kinds, protests, greetings, transferring objects, showing off, acknowledging, and answering, as well as expressions of social feelings such as sympathy (reviewed in Ninio and Snow 1999). One important context in which these behaviours are exhibited and refined is early games such as peekaboo (Ratner and Bruner 1978).

Even before she was one year old, Dora had learned to use the words 'hi' and 'bye' (interchangeably) when coming and going to day-care. The words are part of a *ritual*, which includes the required answer: 'hi' or 'bye' back. The ritual is later enacted in other situations, for example taking a bag and a hat, saying 'bye', and going to the door at home; waiting for the reply to complete the ritual and then returning to play on the rug. If Dora got no reply, or not the correct reply, she got upset and demanded that the ritual be completed. In general, it is common for first linguistic uses to be situated, local meanings, many of which are ritualized in play (see Bruner 1975a; Ervin-Tripp 1991), while rituals play an important role in the transmission of social norms (Rossano, M.J. 2012).

Somewhat later Dora started using the word 'up' as an *imperative* when she wanted to be picked up. The verbal command was often combined with the much earlier raising arms *gesture*

[2] This description is based on observations of one middle-class child, growing up in California in a Hebrew-English bilingual environment. The examples are roughly in the order of their manifestation. I thank Aya Lamm for assistance in producing this list.

(*'pick me up'*).[3] Subsequently, raised arms were used for the up command more generally: saying 'daddy up' together with raised arms, to signify daddy get up – not just pick me up. The word 'up' itself served as a command for 'down' as well, even after the word 'down' was acquired. In one episode Dora said 'Up!', and when asked if she meant she wanted down she said 'Yes. [Now] up!'.

When you tickled or otherwise annoyed Dora while introducing a new expression such as 'doom doom doom', Dora immediately said 'No doom doom doom!' to get you to stop. The expression itself could be anything, and need not have any independent meaning, nor ever be used again. This basic form of *compositionality* ('No X!') appears fairly early, and is used for pragmatic effect. It is not derived from the meaning of assertions.

To help Dora calm down after falling and hurting herself, her parents taught her to *admonish* inanimate objects, like the floor, tables, and doors, by saying 'fuya' ('pfui', an Israeli-Hebrew word which is used to indicate displeasure and disapproval) to the object that 'hit' her. This became a necessary part of calming down after getting hurt (i.e. it became part of a ritual). The admonishing behaviour was used only when the parents were present and depended on other contextual cues. More speculatively, it may be that psychological mechanisms that are involved in detecting 'norm' violations by other individuals also operate when detecting inappropriate 'behaviour' from inanimate objects (and pets, members of other groups, etc.). Normative and modal assessments are similar processes and may be related.

Along with the other children in her day-care class, Dora was taught to use the words 'mine' (initially to indicate/declare possession, but later to express desire to play with a toy laying on the floor etc.) and 'space' (to indicate 'personal space', i.e. that the child doesn't want another child to touch her, or wants to be left alone to play with a toy or with playground equipment). These words function as performatives. It seems that the children 'naturally' want to use them, especially 'mine', and there is a possessive stage where everything is 'mine'. The children also give things to others ('yours'), and can understand a game where you take something from them and say 'mine' (i.e. it belongs to you, not the kid), though such behaviour outside the context of a game would clearly upset them. The possessive form also comes up rather early in Dora's acquisition of syntax and she says 'Mine' as well as 'Dora's' and uses the possessive form with names of other individuals (including 'Daddy's').

The use of 'space' to indicate spatial relationships came much later than the use of the word to indicate a *demand* for personal space. For example, Dora said 'space' when she tried to make her way through a narrow path between two chairs and used 'space' as a form of asking for help with moving obstacles in her path. Somewhat later she learned to use expressions such as 'more space' and so on.

A new set of words Dora acquired is *exclamations*, joke words, and funny sounds used while playing and in other activities. For example: (1) Saying 'Boing!' when something falls, or when throwing something; especially for things that bounce; (2) Saying 'yum yum' for tasty food. It is easy to get a child to realize that these have a different normative status from other words (Dora recognized that her parents smiled when using them, etc.) and the child will not use them in other situations, and will smile when they are used. The words carry weight in interpreting a situation. For example: Dora falls down and is clearly thinking about crying. But the parent says 'Boing!', and

[3] The type of learning involved in acquiring the *pick me up* gesture and the role played by normative cues remain open questions (see Marentette and Nicoladis 2012).

Dora accepts the fall as part of a game and may even try to 'fall' again on purpose by attempting to jump. Similarly, she may throw something she knows she is not allowed to throw (a norm violation), say 'Boing!' and smile, indicating a game, and hence that the behaviour is permissible. Dora also learns to 'sing' (without understanding the words or pronouncing them correctly), especially songs with accompanying hand movements such as 'Itsy Bitsy Spider' and 'The wheels on the bus'.

Dora also learned the *prosody of commands* and associated gestures, and used them when giving commands to her parents. These are probably acquired by imitating teachers, possibly via other children. For example: Using the phrase 'Walk away!' with finger pointing the direction, as an order to leave her alone when she wanted to stay longer in the bath. The response from adults is naturally amusement, not compliance.

Until now Dora's linguistic behaviour mostly consisted of one word utterances or speech-acts. Like many other children, Dora's first significant three-word sentence is 'I want this'. Being able to express *desire* opens up a new normative dimension. At around two years: a lot of 'I want . . .' and 'I need . . .' and mixing the two (corrected by adults, who attempt to clarify the normative distinction). Even many 'I want, I want, I want . . .' sentences, where the actual desire is not specified at all, leading the adult to ask 'Do you want X?' and similar interactions. Later (at 26 months): 'want to' coupled with a verb.

At around this point Dora started to exhibit much better *turn-taking behaviour* coupled with explicit vocabulary for declaring and demanding turns: 'my turn', 'daddy's turn', etc.[4] Note the multiple levels interacting here: Turn-taking is governed by norms (e.g. when is it my turn, when am I allowed to do a certain thing); explicit vocabulary, once introduced, is enormously useful for negotiating possibly highly localized turn-taking rules in any domain (e.g. games, shared eating, etc.); and turn-taking skills, that may have been refined and practised in this way, are an important element of more advanced conversation skills (Ninio and Snow 1999).

At around 27 months, Dora reached the stage of incessant *question asking*. The adult is obliged to answer (thereby participating in the question–answer ritual), and the question is asked again and again. 'What's your name? What's your name?' Part of the fun, it seems, is that the adult has to stop what they are doing and answer . . . Children delight in getting an answer, though it is clearly not the information that they seek, since they ask the same thing again immediately. Many questions of the form 'What's that?' are asked incessantly, e.g. when looking at pictures in a book, or pointing to objects. Even when pointing to blank pages or empty spaces in the book or to text. It seems that most answers are accepted (there are no complaints or tantrums), though the question is often asked repeatedly (and multiple answers are accepted). This appears to be coupled with a tendency to want to read to the adult, i.e. tell the story from the book, or just to point to elements on the page. This game-like activity involves turn-taking, the rituals of dialogue, the linguistic pragmatics of questioning, the mechanics of questions and answers, and, of course, leads to increased vocabulary (see Tomasello and Todd 1983; Ninio and Bruner 1978).

[4] Children are fairly competent at turn-taking by the time they produce their first words but by the time they are five their skills are not yet fully developed (reviewed in Ninio and Snow 1999).

It is at this time that Dora began using *explicitly normative vocabulary*. For example: 'have to take it out' referring to a pit in a fruit that had to be taken out before eating. Explicitly normative vocabulary such as this can be used in commands, requests, questions, or descriptions. Explicitly modal vocabulary, specifically the use of the word 'maybe' also started to appear. This seemed to be used tentatively as if exploring the notion.[5]

While Dora's linguistic and normative skills continue to develop, this tale is enough to illustrate the close developmental interaction between normativity and language capacities, some types of interactions that can occur, and the spectrum of normative dimensions that are involved. It also illustrates how closely language acquisition is tied to norm-governed social institutions such as game playing and social rituals. To summarize, the normative aspects in the behaviours discussed above that are typically marked grammatically or lexically are:

(1) Interjections
(2) Proper names
(3) Imperatives
(4) Possessives
(5) Questions
(6) Explicitly normative vocabulary.

In contrast, the following aspects of normative pragmatics in the behaviours above are not typically explicitly marked grammatically:

(1) Context dependent rituals. Expressions appropriate in specific contexts.
(2) Combined gesture and verbal behaviour, in both song and speech.
(3) Admonishing, conveying disapproval.
(4) Exclamations, joke words, etc.
(5) Pretend play, role-playing, and language games.

Dora's tale gives an idea of how incremental linguistic and normative complexity develops, but it should be noted that the literature suggests that different children exhibit different developmental trajectories and different styles of early speech use (reviewed in Ninio and Snow 1999; see also Dore 1974). Children may be predisposed to display norms and intentions that have arisen due to the evolution of language (and its co-evolution with mind and culture) even before they acquire language. This is particularly to be expected for intentions that have become an entrenched component of human cognition and intentions that play a role in the developmental scaffolding of language. These intentions may be expressed by pre-linguistic children, even though they are not evolutionarily prior to language (see Bruner 1975a, 1975b; Dore 1975, 1978).

[5] The deontic/modal distinction as I use it here can be substantially refined but is sufficient for my needs (see Papafragou 1998).

As I noted earlier, somewhere along both the phylogenetic and the developmental progressions, the normative ought, which goes beyond instrumental ought-ness, appears. While I cannot pinpoint the moment of its appearance in the developmental sketch presented above, children's responses to some infractions seem *prima facie* to display rage that is genuinely normative. Children's early displays of normative learning in the absence of explicit instrumental motivation (e.g. Rakoczy et al. 2008) lend credence to the contention that young children already possess some intrinsic normative feelings that go beyond instrumentally learning appropriate behaviours as means for fulfilling desires. The evolutionary account I present in the next section suggests how genuine normative feelings can come to be exhibited by young children who lack full-fledged normative judgement and reasoning. I am not making any general claim about developmental continuity between 'instrumental oughts' and 'normative oughts', however. The normative ought is probably psychologically primitive and of course both kinds of 'oughts' co-exist.

19.3 The co-evolutionary scenario

It is time to discuss how interactions between the linguistic and normative capacities of the sort discussed in the previous sections could affect the evolution of both, and how the vast amount of psycholinguistic evidence about the development of normative pragmatics can help shed light on the evolution of language. This section covers much ground, so here is an outline of the argument that is elaborated in what follows. First, I discuss how innovations and learned behaviours spread in populations and the role played by normative negotiation. Second, how these changes become multi-generational and how this can lead to changes in the innate capacities of individuals, in particular changes in their learning abilities, predispositions, and biases. Finally, I turn to the implications of these processes. I discuss their effect on the evolution of major linguistic categories and I argue that the co-evolution of language and normativity shaped the unique way in which humans self-consciously subject themselves to norms.

19.3.1 *Spread of innovations*

Each of the many kinds of interactions illustrated in the previous sections can affect the direction in which the language and linguistic practices of a community change. Language communities routinely adopt linguistic innovations. Innovations include the introduction of new vocabulary, refinement of the meaning of existing vocabulary, introduction of speech acts, syntactical changes, changes in the tense system, and so on. These innovations, and changes in linguistic practice more generally, are driving forces in the evolution of the language faculty. Two pressures that face innovations are the ability of enough individuals to comprehend them, and

ultimately produce them appropriately, on the one hand, and the expressive advantage they provide, on the other. Some innovations will become more prevalent in the community or parts of it because of their social or expressive advantages. As the need to understand the new categories becomes more pervasive, individuals predisposed to acquire them or their linguistic markings more easily have an advantage both socially and because the innovations provide useful expressive and reflective abilities. The ability to adjust to innovations in linguistic practice is of prime importance. This may seem not to be the case today since the current linguistic repertoire is very rich and innovations are primarily small lexical changes that do not radically change the expressiveness of the language, but the introduction of categories such as imperatives, questions, possessives, modal vocabulary, and so on, made tremendous changes to what could be expressed and to what listeners had to be able to interpret. To make these general observations more concrete, I want to sketch a central avenue through which normativity and language interact. The first step of this process involves (a) a *commitment*. An individual takes herself or is taken by others to be committed to something, to have an obligation, to be entitled, and so on. Next, this commitment is (b) *challenged* by other members of the community or by the environment. Two archetypical situations are signs of condemnation or disagreement by the community and recognizing an incompatibility between the commitment and an actual state of affairs. The condemnation is often subtle and even implicit in the behaviours of others; signs include things such as raised eyebrows, minute frowns, growing disinterest, all the way up to gossip and open laughter. Whether the challenge is accepted by the individual or not is itself a normative decision and depends on the authority of the critics and on norms governing the appropriateness of censure. The tension that results from the challenge leads to (c) *reasoning*, which consists of various justificatory moves applying both deontic and non-deontic inferences. These result in (d) a *justification* or *clarification*. The justification can be any behaviour or argument that is produced in order to diffuse the challenge. It should be an appropriate response by the lights of the individual producing it and presentable to others if needed. Note that it need not be a justification in any thick sense of the term; the justification only needs to re-establish the legitimacy or appropriateness of the behaviour or belief that established or expressed the problematic commitment, revise it, or revoke it. The justification may be enough to assuage the normative worry. When it does not, a further stage of (e) *norm(ative) refinement* can occur. This may involve instituting new norms, establishing new normative categories (often implicitly), and so on. This five-step process can repeat indefinitely, each time making use of new elements introduced in previous rounds.

Two elements of this process are important for us. First, the reasoning–justification–refinement pathway is deeply and inherently linguistic. Explicit normative reasoning and belief are of course language-dependent; this is the case even if normative reasoning is a *post hoc* rationalization of emotional responses (e.g. Haidt 2001;

Wheatley and Haidt 2005) or involves self-deceit. Language can, and does, change because of pressures affecting these processes, and meanings are clarified and refined (e.g. by introducing new categories: 'It is not a cat, it is a kitten. You didn't say kitten!'). Mechanisms and technologies of negotiation and clarification are introduced along the way, for example conditionals, subjunctives, and discourse markers such as 'but' and 'however' that improve the ability to engage in conversation. Second, note that the entire process depends on the cognitive abilities of individuals and the normative and linguistic capacities of the society more generally. Thus, the precise way in which the process works changes as language and speakers evolve.

19.3.2 *Evolution of innate capacities and social conventions*

All the processes just enumerated take place in the ontogeny of the individuals taking part in them. They involve learning as well as the institution of new social facts and the introduction of linguistic changes. Social facts, however, transcend the individuals who originate them, and even the entire set of individuals involved. Individuals in society are always already both recipients and exemplars of the normative and linguistic structure of their society and new members acquire current conventions and further perpetuate them. This continuity marks both language (de Saussure 1983 [1915]) and norms (Searle 2010). By biasing individual learning toward particular outcomes, the types of norms that individuals can acquire and apply further increase continuity. More generally, since norms increase social conformity they reduce the probability of large fluctuations and dampen them. Consequently, norms do not simply persist between generations; they in effect establish an inheritance system or channel between generations.

The persistent normative and linguistic environment is the context in which individual evolution takes place. This means that evolutionary change is affected by a directional and persistent pressure, which may lead to varying degrees of genetic assimilation and partial assimilation (Jablonka and Lamb 2005; Dor and Jablonka 2000). These terms refer to evolutionary outcomes in which a behaviour or disposition that was once acquired or learned becomes automatic and innate to a certain degree, allowing individuals to reduce the effort and resources required to learn it and freeing up resources for new learning. This results from traditional natural selection operating on variations in learning ability and predispositions.

A mirror image of genetic assimilation that is also a possible response to the evolutionary pressure is the establishment of social and cultural institutions that will make desired behaviours, norms, and so on, more probable or persistent. It is tempting to think of responses of this kind as assimilation to culture as opposed to assimilation to genes. This *assimilation to culture* will make use of explicit and implicit teaching to youngsters; employ changes to the environment they experience, notably by the use of artefacts such as toys; and institute activities that support, enhance, or induce learning such as game playing (see Sterelny 2003). This is one way

in which parenting technologies, in particular forms of alloparenting, may have had great consequences for cognitive evolution (see Hrdy 2009). All these mechanisms involve norms and rely on the normative capacities of individuals. These techniques provide scaffolding for the development of offspring which may result in co-development of the sort discussed in the previous section and bias development toward certain outcomes. Examples of norm-governed scaffolding in language acquisition include the effects of mother–offspring joint attention (Tomasello and Todd 1983) and joint picture-book reading (Ninio and Bruner 1978) on lexical acquisition, and the effects of early games such as peekaboo on the acquisition of dialogue skills (Ratner and Bruner 1978). In a similar fashion, temporal conjunctions are acquired for the purpose of joint planning for play and for social manipulation of peers (Ervin-Tripp 1991). Children need to be receptive to norms to benefit from these social practices. The scaffolded outcomes become prevalent in the society and serve as a stepping stone toward further improvement. In contrast to genetic assimilation which is strictly Darwinian, assimilation to culture depends on cultural innovation which is typically introduced by individuals for the purpose of initiating the young or for some other purposes. It is not based on random variation *per se* and may be the result of deliberation, experimentation, mixing-and-matching, and so on. However, the actual effects of the educational technology are typically uncertain and competition between various approaches undoubtedly occurs. This experimentation can only take place if external selection pressures are not too severe (see Kropotkin 1902). The relaxed selection that is required for this cultural evolution is achieved largely through social support, protection, and division of labour. Once enacted, the developmental scaffolding leads to a second phase of relaxed selection in addition to the relaxed selection that is required for cultural experimentation, this time on the genes that would be involved in ensuring the learned outcome was scaffolding-absent.[6] This permits greater genetic variability in the population which can support further evolution.[7] As they become critical parts of normal cognitive development, the outcomes of both forms of relaxed selection become entrenched and hard to modify (see Deacon 2010).

19.3.3 *Implications*

The co-evolution of the capacities for language and norms through social innovations and assimilation processes helps explain a number of important observations. I focus on (1) why norms are typically generic rules that do not refer to particular

[6] As a concrete example consider genes that lead infants to engage in dialogue with their caregiver. If a game involving such dialogues is customary, having the genes becomes less significant.

[7] This is the assimilation-to-culture counterpart of the assimilate–stretch principle which explains how new learned elements may be recruited, when part of a behavioural sequence that formerly depended on learning becomes genetically assimilated (Jablonka and Lamb 2005: 290).

individuals; (2) the evolution of independent normativity and intrinsic motivation; (3) biases in norm acquisition; (4) the implications of the co-evolutionary scenario for the evolution of emotions; and (5) the relationship between normative and modal reasoning.

An important consequence of the fact that normativity evolves through normative negotiation is that norms are typically generic rules or scripts (Bicchieri 2006) that do not refer to particular individuals (e.g. 'he who has the pole can speak', 'one should be respectful of elders'). As a result, normative negotiation and deontic reasoning come to require the ability to represent and express situations from the perspective of interlocutors and third parties. This creates an evolutionary pressure for the ability to represent situations from multiple perspectives.

The need to justify, rationalize, and reflect on normative commitments and emotional responses will be a driving force in the evolution of meta-cognitive abilities. In addition, normative judgements and reasoning will very likely be recruited to serve as prescriptions in domains other than the social. In this way, norms are freed from the demands of social acceptance and come to play a fundamental role in the private lives of individuals. This and the previous observation help explain the phenomenology of norms discussed in the introduction, in particular their independent normativity and intrinsic motivation.

The pressure for reliable acquisition of norms leads to biases in norm acquisition, which affect the cross-cultural distribution of norms. We should expect some of these biases to manifest themselves as ubiquitous normative categories.[8] Moreover, on the linguistic side, partial assimilation processes, in which innate predispositions evolve to reduce learning costs, may explain the source and prevalence of various linguistic categories and structures, such as pronouns for people, indexicals of various kinds, linguistic categories such as questions, and the prevalent event structure (see Dor and Jablonka 2000). Since categories are introduced and refined constantly, we expect to see the evolution of a capacity for acquiring categories. As experience of the society with categorization advances it is probable that categories will become sharper, since this makes them more useful as well as less prone to elicit conflicts of interpretation. Eventually, categorization as such may require the establishment of sharp boundaries.[9] Learning and modifying the results of previous learning in both domains are fundamental to the ontogenetic processes, and will be selected for. We would also expect the capacity for innovation in both domains to concomitantly evolve. Language and norms will thus remain learned abilities and not become entirely innate. Consequently,

[8] A case in point might be the observation that we find norms regarding murder and incest in all cultures but each culture exhibits local variation in the situations that are considered to be murder or incest.

[9] Cave drawings and figurines often depict beings that are part animal and part human. It is interesting to speculate if this reflects changes in categorization and hence in conceptual thought.

assimilation will, by necessity, be at most partial, leaving ample room for cultural evolution and scaffolding. So while normativity may make use of specific learning mechanisms for identifying behaviours that should serve as candidate norms, and employ mechanisms for generalizing from them, we expect concrete norms to typically not be innate.

I turn to implications for the evolution of emotions. First, many mistakes and misunderstandings manifest themselves as normative infractions. As examples, consider the inappropriate use of a label, such as one carrying problematic connotations, mistakenly issuing a demand rather than a polite request, or simply not listening when you are expected to listen. Being able to acquire the appropriate norms and, just as importantly, to recognize signs such as frowning or grunting that indicate that your behaviour is judged by others as inappropriate, giving you a chance to make amends, are critical skills. There are various ways to respond to norm violations, for both the culprit and the other parties, perhaps the most important of which is diffusing such situations (e.g. through conversational repair) and negotiating refined norms for the future. This normative rigmarole involves many emotional responses (Wilson and O'Gorman 2003). Noticing a violation, as well as being found by others to be a violator, involves emotions such as anger, condemnation, blame, guilt, and shame. There will be an evolutionary pressure for appropriate emotional responses, for greater emotional control, for recognizing emotional cues from others, for rationalizing and reflecting on emotional responses, and for 'emotional engineering' skills, such as displaying appropriate signs of contrition and humility or telling jokes.

Moreover, because of the importance of normative negotiation, we would expect to see emotions becoming more cognitive so that individuals are able, to a degree, to articulate (and thus often further sublimate) their emotional responses. At the same time, we would expect a more or less standardized repertoire of expressions signalling the emotions that arise from recognizing norm violations and strong psychological responses to slight punitive behaviours (i.e. behaviours that are not costly to produce, do not involve violence, etc.). This allows de-escalation of conflicts that are par for the course for norm-governed societies (and that, since norms are variable and changing, cannot be resolved 'evolutionarily' through ritualized behaviour that replaces the conflict altogether). There is also a strong evolutionary pressure for the capacity to quickly and reliably recognize norm- as well as linguistic violations. This favours some level of dedicated processing that does not rely on conscious reflection and may involve recognizing physiological cues in others (e.g. blushing, sweating).[10]

I conclude this section with the possible connection between modal and normative notions. If these are indeed related, as I speculated earlier, then improved normative

[10] The model proposed here highlights that deliberation can lead to emotional responses that bypass conscious reasoning providing a middle-ground between sentimentalism and rationalism about morality.

acquisition, assessment, renegotiation, and refinement will play a role in improved coping with the environment, in which epistemic modal reasoning plays a role, and vice versa. This may be particularly significant in complex situations. An important case is the combined social and environmental coping that is part of the manufacture and use of complex tools. Both normative and modal capacities are involved in teaching and learning the possibly multi-person processes of tool making and for handling the epistemic context about the environment and the state of the tool that is needed for successful use of tools. Modal and normative sophistication as well as emotional control, particularly patience, are requirements for a society constructing and making use of complex tools (cf. Stout 2010; Casler et al. 2009; Kenward et al. 2011).

19.4 Predictions

The co-developmental and co-evolutionary interactions suggest a wide range of concrete predictions many of which are confirmed by contemporary psycholinguistics, developmental psychology, cognitive science, anthropology, and evolutionary analysis.

19.4.1 *Language- and norm-acquisition*

Norms play a critical role in the acquisition of language, and language plays a role in the acquisition of many social norms. This provides many opportunities for studying their developmental interactions. Among the predictions that the co-evolutionary scenario suggests are the following:

1. We expect young (pre-school) children to be able to justify their normative behaviour (e.g. to complain if punished unfairly) and explain normative breaches by others. This is indeed the case (see Ingram and Bering 2010; Harris and Núñez 1996).
2. The young age at which children begin expressing possessive sentiments and the prevalence of norms of personal ownership leads us to expect that children's use of the word 'mine' typically occurs before the use of the words 'yours' and 'his' and that the expression 'mine' is first used as a declarative. We can further hypothesize an evolutionary progression from 'mine' (possession, from a first person perspective), possibly even 'my mom' in an allocare context, on to attribution of possession to others ('his'/'hers') that is used when possession is enforced by third parties (which may be unique to humans, see Tomasello 2009: 88), finally paving the way to possessives of a more general form or to norms of possession via partial assimilation. Other pronouns and indexicals can also arise and be utilized in such scenarios. Note that the observation that possessives and the related mental concepts arise at an early normative and linguistic

developmental stage is consistent with the notion of possession being partly genetically assimilated and partly constructed socially, to varying degrees (the disposition can be genetic, social, or both). It should also be noted that various languages have richer systems of possessive classifiers than found, for example, in English (discussed in Evans 2011: ch. 4); however, data on acquisition patterns for most languages used by small populations is very limited and more research is needed. It is also of great interest to examine the developmental trajectory of these norms in children growing up in egalitarian communities, such as the kibbutz.

3. We expect explicitly normative and explicitly modal vocabularies to be related. In particular, we expect the normative vocabulary to be acquired first, or for them to appear at roughly the same time, and for the vocabularies to overlap. This prediction matches cross-linguistic evidence that indicates that both kinds of meaning tend to be expressed using a single class of modal expressions and that modal (i.e. epistemic) meanings are typically acquired later than normative meanings (reviewed in Papafragou 1998). Similar acquisition patterns of words denoting different strengths of commitment within each category further support the hypothesis that normativity and modality are cognitively related (Papafragou 1998). Further confirmation comes from the observation that children's early use of causal vocabulary (i.e. 'because' and 'so') is for justifying commands and requests, while epistemic uses occur later and are less frequent (Kyrantzis et al. 1990), and from the observation that modal expressions such as 'can' and 'will' are acquired for social, hence normative, purposes, in particular for permission requests (Ervin-Tripp 1991).
4. We expect to see some specialization for linguistic norm acquisition and possibly enforcement. We predict that empirical research will show that linguistic behaviour (pragmatics), including intonation and other aspects of prosody, is understood by infants as norm-governed without or with little need for other behavioural cues indication that a norm prevails. In addition, the centrality of normativity in human cognition that is emphasized by the co-evolutionary account suggests that we should expect to find a general tendency or a 'default assumption' in children that observed behaviours should be understood normatively, and dedicated mechanisms for recognizing relevant behaviours and generalizing norms from them. This is indeed the case (Schmidt et al. 2011; Kenward et al. 2011; Casler et al. 2009; Rakoczy et al. 2008).

19.4.2 *Impairments and pathologies*

We expect that impaired normativity will typically be coupled with impaired language. Improvement in language through therapy will lead to improvement in normative capacity and vice versa. Data on language acquisition in the autism

spectrum disorders (ASD) can help assess these hypotheses further since both faculties are impaired. As expected, pragmatics are significantly deficient in both high- and low-functioning ASD individuals, as is prosody. Significantly, while the empirical picture is complex it appears that acquisition of grammar, not only pragmatics, is deficient in autistic children. Among the pragmatic skills that are impaired are conversational skills, handling of questions and commands, comprehension and construction of narratives and the use of humour. Pragmatics remain impaired even in children who overcome an ASD diagnosis (reviewed in Eigsti et al. 2011).

19.4.3 *Social evolution, cultural evolution, social institutions*

Here are several predictions regarding social and cultural evolution:

1. We expect that complex language and sophisticated tool use and manufacture have emerged at roughly the same time (see Stout 2010, 2011). Both involve advances in normative capacity. While norms in the rich sense described in the introduction may not be strictly necessary for cumulative cultural evolution, which is required for producing complex tools, normativity and norms contribute to the coordination required for tool manufacture and for the teaching of tool building (including via natural pedagogy, Csibra and Gergely 2009). Modality may also play a significant role in the use and manufacture of complex tools that comprise multiple stages. In addition, normativity will improve the transmissibility of tool culture, including both the preservation and the accumulation of modifications, as well as the regulation of innovation (see Kenward et al. 2011; Casler et al. 2009).
2. We expect to find a tendency for punitive behaviours, in particular avoidance and exclusion, due to linguistic violations. These are behaviours and emotions that are typically related to norm violations (see Sober and Wilson 1998; Sripada and Stich 2006). Congruent with this prediction is the typical use of language for group differentiation and social exclusion.

   We expect the punitive emotional responses that arise when detecting both social norm- and linguistic norm-violations to have physiological manifestations. Similarly, we expect that intentional violation of both kinds of norms will be correlated with physiological manifestations in the transgressor, e.g. blushing, increased heart rate, sweating, etc.
3. Evolution of language and evolution of psychological altruism are intimately related. Human cognition depends on language, and since the hypothesis is that language co-evolved with human normativity, an organism with human cognitive abilities is expected to have a sophisticated normative ability and a rich normative repertoire. Moreover, the importance of scaffolding for language acquisition increases the likelihood that children be predisposed to cooperative

behaviour since this makes scaffolding much easier. This indeed seems to be the case (see Tomasello 2009; Warneken and Tomasello 2009). Human normativity is not merely a prerequisite or a 'modular' add-on, but rather an entrenched and co-evolved part of individual human cognition that played a role throughout its evolution. Its evolution cannot be explained independently of the evolution of language. These considerations have profound implications for debates regarding level of selection needed to explain the evolution of altruism that I cannot develop here. Sripada and Stich (2006: 285) make related claims about normativity and psychological altruism; Knight (2008b) argues that language co-evolved with the rule of law and discusses the evolutionary origin of language in light of various models for the evolution of cooperation.

19.5 Conclusion

The starting point for the discussion in this chapter is that language is a learned, norm-governed, intentional communication system. All of these properties must clearly take part in any attempt to explain the evolution of language. I thus focused my attention on the evolutionary pressures and dynamics that can be found in a society that makes use of learned communication and consists of individuals who have rudimentary susceptibility to social norms (which requires some ability to form expectations, experience surprise, and recognize intentions and mistakes). These are not trivial requirements but they are very far from being equivalent to language or contemporary human normativity. Importantly, they are within the realm of possibility of our closest primate relatives.

I discussed how the evolutionary interaction between language and normativity helps explain the emergence of fundamental aspects of human languages (e.g. imperatives, questions, possessives, modal vocabulary, categorization, performatives) and of human normativity, in particular its entrenched role in human cognition and some aspects of its ontogeny and phenomenology (e.g. independent normativity and intrinsic motivation, the ability to represent situations from multiple perspectives, and the ontogeny of normative categories and vocabulary that result from normative negotiation and metacognition).

It is now accepted by most researchers that cultural evolution is a critical factor in understanding human evolution and that gene-culture co-evolution probably played a significant role in the evolution of the human mind. Society and the social forces it gives rise to, culture with its cognitive and material benefits, and individual human cognition all take part in this evolution. Normativity affects and connects all three realms: norms and the human capacity to acquire and implement them are basic structural elements of human society. They underlie most cultural knowledge and play a part in its transmission between individuals and generations. Finally, the

individual mind determines what counts as normative and the phenomenology of normativity, and is itself shaped ontogenetically by developmental scaffolding that is norm-governed. As I tried to show in this chapter, normativity and language, two hallmarks of human cognition, are intimately related. Language acquisition, in particular, is greatly assisted by norm-governed social institutions. These institutions probably had an even greater role than they have today early on in the evolution of language. Human language and normativity transformed and shaped each other during their evolution. They remain closely intertwined in contemporary humans.

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