A Difficulty for Simulation Theory
Due to the Close Connection of Pretense and Action in Early Childhood

Eric Schwitzgebel
Department of Philosophy
University of California
Riverside, CA 92521-0201
eschwitz@citrus.ucr.edu
(909) 787 4288

draft: August 3, 2000

A Difficulty for Simulation Theory
Due to the Close Connection of Pretense and Action in Early Childhood

ABSTRACT

Much of the appeal of simulation theory stems from the fact that a conscious process something like simulation seems to underlie some of our mental state attributions. However, if young children consciously simulate, and if simulation is a form of pretense, then we should expect them, at least sometimes, to act out their simulations. Since we do not ordinarily see this, it follows that children either do not consciously simulate or that simulation is further removed from pretense than its advocates typically claim.

A Difficulty for Simulation Theory
Due to the Close Connection of Pretense and Action in Early Childhood

'Simulation Theory', as I will be using term, refers to the view, advocated by Robert Gordon (1986), Alvin Goldman (1989), Paul Harris (1992), and others, that we ordinarily understand and predict the behavior and mental states of other people by "simulation" – that is, by imagining things from the other's perspective and then engaging in "off-line" or "pretend" reasoning and responding. So, for example, in predicting how Brad might respond to an insult, I imagine myself in Brad's position and engage the cognitive and emotional systems that I normally use in reacting to insults. These systems then generate a simulated output – anger, for example – which I predict as Brad's likely reaction. Although advocates of Simulation Theory generally grant that simulation must frequently occur without consciousness, since we are often unaware of the procedures by means of which we make psychological judgments about other people, much of the intuitive appeal of Simulation Theory comes from the fact that we do sometimes seem consciously to simulate in thinking about the mental lives of others. I will describe in this paper why I think it unlikely that conscious simulation plays a primary role in the development of our understanding of other minds.

I will focus on simulation as a conscious process. I see no compelling reason to suppose that the conscious processes we employ in coming to predict and understand the behavior and mental states of others must resemble the nonconscious ones, even assuming the products of both processes to be conscious judgments. In general, it is plausible to suppose that there are divergences between the conscious and nonconscious processes we employ in reaching the same sorts of judgments. If mainstream contemporary linguistics is correct, for instance, the processes we employ nonconsciously

in reaching (conscious) intuitive judgments about grammaticality look very different from the conscious processes we use to reach grammaticality judgments. A conscious procedure might involve our half-remembered high-school grammar; our nonconscious procedures involve no such thing, perhaps universal grammar or some other, equally arcane procedure of the sort described in linguistics journals. It likewise seems plausible to suppose that a conscious procedure for judging where a ball hit into the air will land – perhaps by imagining it travelling in a parabolic arc – differs from the nonconscious procedures we ordinarily employ in reaching the same sorts of judgments. We do not, I am inclined to think, ordinarily nonconsciously imagine the ball travelling in a parabolic arc.

Simulation Theory is then divisible into two independent claims: first, that our conscious processes of arriving at judgments about other minds involve a simulative technique of the sort described at the beginning of this paper, and second, that our nonconscious processes do. (The nonconscious processes may differ further in yielding either conscious or nonconscious results, and perhaps one would wish to say that different processes are involved in the two cases, though I will set that issue aside.) Architectural and computational arguments for Simulation Theory on grounds of its efficiency (e.g., in Cruz, 1998; Goldman, 1992) work, if at all, best for simulation considered as a nonconscious process, since we frequently and quickly make psychological judgments about others by nonconscious procedures. Our conscious methods for reaching such judgments, on the other hand, appear to be slow and comparatively uncommon, and I see little reason to regard them as particularly efficient.

The defender of what I will call "florid simulationism" contends that there is something uniquely imaginative in our understanding of other minds, something that involves pretending in some sense to be another person, a kind of imagination or pretense richer than the sort of hypothetical reasoning and imagination characteristic of our thought about such non-psychological domains as physics and biology. It is not clear that everyone who has been classified as a simulationist would accept such a view (see, e.g., Heal, 1998), but Harris and Gordon seem to embrace it. Harris, for example, claims that simulation involves a "distinctive type of imaginative understanding" (1989, p. 51). Gordon characterizes the methodology of simulation as "hot" – employing "one's own motivational and emotional resources" – as opposed to the "cold" methodology of scientific theorizing that does not employ such resources (1996, p. 11). Gordon describes how Hermia (from A Midsummer Night's Dream) might think about Demetrius' decisions and actions. She does so

> by moving, not from belief to belief, but through a variety of mental states culminating in a decision – not a decision she herself was prepared to act on, but one made with the express purpose of anticipating or predicting Demetrius' decisions and actions. Before making these decisions, she would transport herself in imagination into his situation to the extent to which it seemed, to a first approximation, relevantly different from her own; but not strictly transport herself, Hermia, but rather a self transformed, insofar as seemed necessary, into someone who would behave as she had known Demetrius to behave (Gordon, 1996, p. 12, emphasis in original).

It does seem that we sometimes engage in imaginative projects of at least roughly the sort described. The version of Simulation Theory I take as my target in this paper endorses the view that our primary conscious method for arriving at judgments about others' behavior and mental states involves imagination in this rich way, in a way uniquely characteristic of psychological reflection.

This view lends itself to a certain developmental story, versions of which have been endorsed by Harris (1989, 1992, forthcoming) and Gordon (1992; see also Stich and Nichols, 1992). The story runs as follows. One thing that children are good at from a very early age – two years – is pretend play. They can scoot a block along the floor, pretending it is a truck. They can pretend they are parents giving their baby (a doll) a bath. Our understanding of other minds has its origins in such childhood pretense. Just as a child can pretend to be a parent, a child can pretend to be her parent in particular. Engaging in such pretense, the child can do essentially what adults do in the imaginative transformations described by simulation theorists, and thus they can understand others' mental states and behavior. And this, in fact, is how they ordinarily do understand other people's mental states and behavior. Harris characterizes it thus:

> [C]hildren's awareness of particular mental states, and their ability to pretend, enables them to imagine being in a particular mental state. For example, the child can imagine wanting something: recall the episode of pretend play described earlier when J. announced: 'Farmer want a bath.'
>
> The next step for the child is to examine reality to see whether it matches what is desired. If there is a match, then the child can generate not an actual emotion but an 'as if' or pretend emotion of happiness. If, on the other

> hand, there is not a match, if the simulated desire is not fulfilled, then the child can generate an 'as if' sadness or discomfort. These simulated or pretend emotions can then be attributed to the other person (Harris, 1989, p. 65, emphasis in original).

To be sure, according to Harris and Gordon, the simulations are imperfect at first, and children are not good at adjusting for relevant differences between themselves and others. However, as their simulative capacities improve, so also does their performance at tasks requiring the understanding of other people's minds (Gordon, 1992; Harris, 1991, 1992). This developmental story seems to get support – as Gordon and Barker (1994) point out – from the fact that autistic children, who show deficiencies in pretend play, do very poorly at tasks requiring the understanding of other minds (Baron-Cohen, 1995; see also Harris, 1991). Marjorie Taylor and Stephanie Carlson (1997) also find a positive correlation between having a rich fantasy life and doing well on the classic "theory of mind" tasks, even controlling for age and one measure of verbal intelligence. (However, other studies seeking correlations between pretense and psychological understanding have had mixed results that are difficult to interpret, e.g., Astington and Jenkins, 1995; Hughes & Dunn, 1997; Schwebel, Rosen & Singer, 1999.)

Children do pretend that they are other people, and sometimes such pretense may help them in understanding other minds. For example, perhaps a child, after a confusing interaction at preschool, will come home and play out the roles of herself and others at the preschool, until some sort of resolution or understanding is reached. If such events do occur, they provide good reason to think that rich, imaginative simulation plays some role in the preschooler's development of an understanding of other minds. However, I think it

is a mistake to regard this as the primary method children employ in their conscious thinking about others' mental states.

My skepticism on this front arises from the tight connection I see between pretense and action in early childhood. One argument for this connection is Vygotskian. Lev Vygotsky (1978) argues that all the higher psychological functions, among which I believe he would include pretense, begin as outward actions and are only gradually internalized. So, for example, Vygotsky argues that inner speech – talking silently to oneself – must begin as outer speech. At first, all speech is directed toward others; then one begins to speak aloud to oneself; only later can one speak silently to oneself (Vygotsky, 1962). Although Vygotsky never (to my knowledge) described such an evolution in pretend play, one would suppose the Vygotskian line to be that pretend play, in its origins, must be physically acted out – and only later can one pretend without acting.

Independent of any strictly Vygotskian argument, however, many investigators share my sense that there is a tight connection between pretense and action. The philosopher John Austin, with his famous ear for English usage, claims that in pretending "there must be something, and something public, that I am actually doing, some action I actually am performing, in pretending and in order to pretend" (Austin, 1961, p. 206). Although Austin later grants that sometimes pretense is merely a "preliminary to" public behavior characteristic of the object of pretense, he says that "it remains true that there is an immediate connexion with non-verbal behavior" (Austin, 1961, p. 218). In the developmental literature, in characterizing pretense, both Angeline Lillard (1993) and Jacqueline Woolley (1995) describe pretend play as characteristically acted out, and

descriptions of pretense in the developmental literature almost invariably focus on actions physically performed by a child or an adult partner.

Recent philosophical accounts of pretense also closely connect pretense and behavior. Shaun Nichols and Stephen Stich (2000), in fact, characterize pretense as a type of behavior – behavior motivated by a desire to behave in a way similar to the way some character or object behaves in some imagined possible world. For example, one might imagine a possible world in which a queen instructs her servants to bring her ice cream. Pretend play is then the consequence of acting on the desire to behave like such a queen (or such a servant). Alternatively, following Velleman (forthcoming), one might regard imagination as motivating behavior independent of any desire to behave in accord with what is imagined. For example, in muttering under one's breath while driving, one may be acting out an imagined conversation or a reaction to an imagined event despite seemingly having no positive desire to do so (or even desiring not to do so). On Velleman's view, imagination is characteristically acted out in early childhood pretense and restraint is only gradually learned as one approaches adulthood.

I am tempted to endorse a hybrid of Nichols' and Stich's and Velleman's accounts. Pretense is sometimes or partially, but not always or wholly, behavior motivated by a desire of the sort described by Nichols and Stich; imagination sometimes, but not always, creates a desire-independent impulse to behave of the sort that Velleman emphasizes. Nichols' and Stich's approach nicely handles deliberate role-playing, but excludes cases in which the pretense is not motivated by a positive desire to act in the way imagined. Velleman's approach is complementary, working well for just the sort of unreflective, expressive, yet imaginatively-driven behavior that Nichols and Stich neglect, but not

applying to the deliberate acts of pretense for which their account is best suited. What proportion of childhood pretense is best covered by each account is an interesting question that eludes my competence.

No matter how such issues are resolved, however, discussions of pretense in both psychology and philosophy generally assume or imply an intimate connection between pretense and behavior. Thus, it is plausible to suppose that if florid Simulation Theory is correct, and if we interpret literally its advocates' use of the term 'pretend', then we should see young children – at least when they are engaged in simulation at a conscious, personal level – acting out, to some extent, their pretense. Even supposing that pretense needn't always be acted out and that adults in particular are well able to internalize it and refrain from acting on the impulses it generates, young children are poor internalizers, their impulse control is very limited, and they readily act out other sorts of pretense. It would be surprising if pretense in simulation provided an exception to all these tendencies.

However, children rarely overtly simulate in this way. They may occasionally do so in the sort of situation I described above, in which the child is recapitulating a confusing or frustrating interaction; but in real-time interactions with other people, interactions that often require thinking about and anticipating others' mental states and behavior, we very rarely see children overtly imitating and pretending to be the people whose mental lives concern them. I am speaking from anecdotal evidence here, but I anticipate agreement on this point. Sympathy and care-giving, for instance, are very early reactions children have to the suffering of others (Murphy, 1937; Harris, 1989) – reactions that appear to depend on realizing something about the mental lives of others,

i.e., that they are suffering – yet it would be surprising to see a child acting out a pretense involving the other person prior to offering consolation. If Jeanette skins her knee and two-year-old Marcus comes to comfort her, he does not first overtly pretend that he has a bloody knee in order to determine that Jeanette must be suffering. Betty Repacholi and Alison Gopnik (1997) find very early understanding of difference in taste for food. Eighteen-month-olds who prefer crackers to broccoli will, when an experimenter requests food, offer broccoli if the experimenter previously expressed a taste for broccoli over crackers or crackers if she previously expressed a taste for crackers over broccoli. In observing a number of these experiments, I never once noticed any overt pretense on the part of the child, though it seems plausible to suppose that the children are displaying psychological understanding.

These facts suggest that the conscious processes by means of which young children make psychological judgments are not simulative in the rich sense required by the florid simulationist. However, I do see two ways in which this conclusion can be avoided. One is to assert that the only conscious procedure children use in thinking about the mental states of others is the kind of pretend play they act out in the absence of the relevant parties, on their own time (or maybe occasional quasi-theoretical inference which the simulation theorist may allow to play a secondary role); all real-time psychological reasoning is nonconscious, perhaps simulative, but at a sub-personal level. This claim, however, seems ad hoc and unverifiable. Why should we assume that young children only rarely reason about others' mental lives at a conscious, personal level, when adults frequently do so? Perhaps that claim would seem plausible to one who contends that young children rarely consciously reason about anything – but to defend that claim would

require arguments quite distinct from the sorts of arguments that simulation theorists have so far offered.

A possibly more appealing way to avoid the objection I have raised in this paper involves retelling the developmental story in a slightly different way. After all, children clearly can engage in quiet imagination without acting it out in pretend play. Estes, Wellman, and Woolley (1989), for example, have children sit quietly while they imagine a cup turning upside down. Also, listening to stories engages the imagination in an important way and does not involve pretense on the part of the child. Perhaps rather than pretend play, we should treat this sort of quiet imagination, unaccompanied by overt action, as the basis of simulation. Sometimes the word 'pretend' is even used to refer to such quiet imagination, as perhaps it is in Dias and Harris (1990) when they say to the children in their study, "Let's pretend that I am in another planet. Everything in that planet is different. Now I'm going to tell you some stories about that planet…" (p. 309). Given such uses of the word 'pretend', one might even be tempted to suppose that from the beginning advocates of florid Simulation Theory have meant to connect simulation to quiet imagination and that in interpreting their uses of 'pretense' as I do I have been interpreting the term differently than they intend.

However, there are several reasons to think that the florid simulationist would want to resist such a characterization. First, quiet imagination is used in the sciences and so is not distinctively characteristic of psychological understanding. A biologist can imagine what would happen if a certain sort of predator were to come to an island; a chemist can imagine the configuration of a new organic molecule and how that should affect its reactivity with other molecules; I can imagine the chaos in my house if a tree were to

crash into the kitchen while we are away on vacation. All these forms of imagination can involve "narrative absorption" (as Harris (forthcoming) uses the term) and taking a visual perspective on the imagined events, and need not involve the conscious deployment of theories, and thus have a number of features characteristic of simulative imagination; however, the florid simulationist wants to appeal to some sort of imagination or pretense that is "hotter" in Gordon's (1996) sense than such scientific imaginings, a form of imagination employed exclusively in psychological understanding, tapping into the simulator's own "off-line" motivational structures. If all that is involved in conscious psychological reflection is quiet imagination and hypothetical reasoning of the sort described at the beginning of this paragraph, then there is nothing in the methodology of understanding other minds that is different from the methodologies employed in the sciences, and florid Simulation Theory is false.

Second, if simulation is a development of quiet imagination rather than pretense, Harris' and Gordon's emphasis on the connections between the development of pretend play or role playing and the development of psychological understanding are misplaced or at least insufficiently motivated. Prima facie, equal emphasis should be put on connections between psychological understanding and other sorts of imaginative enterprises in childhood, such as story telling and comprehension, daydreaming, or spatial problem-solving. (In fact, Harris (forthcoming) does make some moves in this direction.)

Finally, autistic people seem to be good at quiet imagination (even if they often aren't "imaginative" in the sense of being creative; Wing, 1978), despite their deficits in pretend play and in understanding other people's minds. For example, autistic children

seem to have no difficulty generating an image of a flying pig (Scott, Baron-Cohen & Leslie, 1999) or imagining physical transformations (Baron-Cohen, 1997; Kavanaugh & Harris, 1994). Thus, if quiet imagination, not pretense, were the mechanism of simulation, that would undercut the argument for Simulation Theory based on the lack in autistic people of both pretend play and good psychological understanding. Worse, the argument might seem to cut the other way: If autistic people are as good at quiet imagination as at least some seem to be, why aren't they better at ascribing mental states?

Consider the (admittedly in some respects unusual) case of Temple Grandin, described by Oliver Sacks (1995):

> [Grandin] designs the most elaborate facilities in her mind, visualizing every component of the system, juxtaposing them in different ways, viewing them from different angles, from near and far. Once the design is complete, she will "run a simulation" in her mind – that is, imagine the entire plant in operation. This simulation may show an unexpected problem, and when this happens, she will pinpoint the problem, modify the design, do another simulation – several simulations if need be – until the design is perfect (Sacks, 1995, p. 283).

Furthermore, Temple Grandin says that in doing such simulations "I turn myself into an animal, and feel what it would feel entering the chute" (Sacks, 1995, p. 267).

Perhaps with this last imaginative maneuver, Grandin passes from simple imagination to the sort of pretense the simulation theorist has in mind – and maybe, in her case at least, we would want to say that her incapacity understanding the mental states of other human beings is independent of any general inability to simulate. Perhaps she has

some specific inability to simulate people – or perhaps the understanding of others' mental lives is not primarily a simulative activity.

Setting the issue of autism aside, my primary point is that if the florid simulationist is to save his developmental story from the objection I have detailed in this paper, simulation must be rooted in something a little different from pretend play and something a little different from imagination of the sort common in engineering and the natural sciences. What this root capacity might be is unclear. I am not at all confident that such a capacity, playing just the right role, could be found.

Could the defender of florid Simulation Theory respond to my objections by jettisoning the developmental story? Perhaps simulation is not the primary way young children understand other minds. It is surely conceivable that the main conscious procedure adults use to think about other minds is simulation, even if that is not how children do it. Perhaps the conscious process is theoretical in childhood and simulation is a late development?

If the defender of Simulation Theory wishes to take this route, however, a complex story begs to be told. When does simulation start? Out of what capacities does it arise? What kinds of errors do people who are simulating, but don't have the hang of it yet, tend to make? And when do we find such errors in development? If simulation is a late development, then good answers to such empirical questions must be discoverable; otherwise the claim is a mere smoky distraction.

The best hope, probably, for the florid simulationist is to insist that simulation is how we do it from the start and take on the work of characterizing more accurately exactly what the capacity is that is supposed to be involved.

ACKNOWLEDGEMENTS

A number of people have given me useful feedback on the ideas in this paper, including Joe Cruz, Jim Garson, Alvin Goldman, Alison Gopnik, Bob Gordon, Jane Heal, Tori McGeer, Shaun Nichols, Penny Vinden, participants in the 1999 NEH summer seminar on Simulation Theory and Theory Theory directed by Robert Gordon, and an anonymous referee. Any faults in the paper are no doubt due to their pernicious influence. Tori McGeer convinced me of the relevance of Temple Grandin to the debate about simulation theory, and my interpretation of the case is derivative of hers. Thanks are also due to the National Endowment for the Humanities for supporting my participation in Gordon's summer seminar during which the bulk of this paper was researched and written.

REFERENCES

Astington, J. W., & Jenkins, J. M. 1995: Theory of Mind Development and Social Understanding. Cognition and Emotion, 9, 151-165.

Austin, J. L. 1961: Philosophical Papers. Oxford: Clarendon.

Baron-Cohen, S. 1995: Mindblindness: An Essay on Autism and Theory of Mind. Cambridge, MA: MIT.

Baron-Cohen, S. 1997: Are Children with Autism Superior at Folk Physics? New Directions for Child Development, 75, 45-54.

Cruz, J. L. H. 1998: Mindreading: Mental State Attribution and Cognitive Architecture. Mind & Language, 13, 323-340.

Dias, M. G. & Harris, P. L. 1990: The Influence of the Imagination on Reasoning by Young Children. British Journal of Developmental Psychology, 8, 305-318.

Estes, D., Wellman, H. M., & Woolley, J. D. 1989: Children's Understanding of Mental Phenomena. Advances in Child Development and Behavior, 22, 41-87.

Goldman, A. I. 1989: Interpretation Psychologized. Mind & Language, 4, 161-185.

Goldman, A. I. 1992: In Defense of Simulation Theory. Mind & Language, 7, 104-119.

Gordon, R. M. 1986: Folk Psychology as Simulation. Mind & Language, 1, 158-171.

Gordon, R. M. 1992: Reply to Stich and Nichols. Mind & Language, 7, 87-97.

Gordon, R. M. 1996: 'Radical' Simulationism. In P. Carruthers & P. K. Smith (eds.), Theories of Theories of Mind. Cambridge: Cambridge.

Gordon, R. M., & Barker, J. A. 1994: Austism and the 'Theory of Mind' Debate. In G. Graham & G. L. Stephens (eds.), Philosophical Psychopathology: A Book of Readings. Cambridge, MA: MIT.

Harris, P. L. 1989: Children and Emotion. Oxford: Basil Blackwell.

Harris, P. L. 1991: The Work of the Imagination. In A. Whiten (ed.), Natural Theories of Mind. Oxford: Basil Blackwell.

Harris, P. L. 1992: From Simulation to Folk Psychology. Mind & Language, 7, 120-144.

Harris, P. L. forthcoming: The Work of the Imagination. Oxford: Clarendon.

Heal, J. 1998: Co-Cognition and Off-Line Simulation. Mind & Language, 13, 477-498.

Hughes, C., & Dunn, J. 1997: "Pretend You Didn't Know": Preschoolers' Talk about Mental States in Pretend Play. Cognitive Development, 12, 477-499.

Kavanaugh, R. D. & Harris, P. L. 1994: Imagining the Outcome of Pretend Transformations: Assessing the Competence of Normal Children and Children with Autism. Developmental Psychology, 30, 847-854.

Lillard, A. S. 1993: Young Children's Conceptualization of Pretense: Action or Mental Representational State? Child Development, 64, 372-386.

Murphy, L. B. 1937: Social Behavior and Child Personality. New York: Columbia.

Nichols, S & Stich, S. 2000: A Cognitive Theory of Pretense. Cognition, 74, 115-147.

Repacholi, B. M., & Gopnik, A. 1997: Early Reasoning about Desires: Evidence from 14- and 18-Month Olds. Developmental Psychology, 33, 12-21.

Sacks, O. 1995: An Anthropologist on Mars. New York: Random House.

Schwebel, D. C., Rosen, C. S., & Singer, J. L. 1999: Preschoolers' Pretend Play and Theory of Mind: The Role of Jointly Constructed Pretence. British Journal of Developmental Psychology, 17, 333-348.

Scott, F. J., Baron-Cohen, S., & Leslie, A. 1999: 'If Pigs Could Fly': A Test of Counterfactual Reasoning and Pretence in Children with Autism. British Journal of Developmental Psychology, 17, 349-362.

Stich, S., & Nichols, S. 1992: Folk Psychology: Simulation or Tacit Theory? Mind & Language, 7, 35-71.

Taylor, M., & Carlson, S. M. 1997: The Relation Between Individual Differences in Fantasy and Theory of Mind. Child Development, 68, 436-455.

Velleman, J. D. forthcoming: The Possibility of Practical Reason. Oxford.

Vygotsky, L. S. 1962: Thought and Language. Trans. E. Hanfmann and G. Vakar. Cambridge, MA: MIT.

Vygotsky, L. S. 1978: Mind in Society. Ed. M. Cole, V. John-Steiner, S. Scribner, and E. Souberman. Cambridge, MA: Harvard.

Wing, L, 1978: Social, Behavioral, and Cognitive Characteristics: An Epidemiological Approach. In M. Rutter & E. Schopler (eds.), Autism, a Reappraisal of Concepts and Treatment. New York: Plenum.

Woolley, J. D. 1995: The Fictional Mind: Young Children's Understanding of Imagination, Pretense, and Dreams. Developmental Review, 15, 172-211.