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Philosophical and psychological approaches to social cognition and theories of autism

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Supervisory editors:
Zivan Lazovic and Vojislav Bozickovic

Copy editor:
Kevin Buzinski

Izdavač:
Institut za filozofiju
Univerzitet u Beogradu
Filozofski fakultet

ISBN: 978-86-88803-97-7

1 Ova knjiga nastala je u okviru projekta"Dinamički sistemi u prirodi i društvu: filozofski i empirijski aspekti" (evidencioni broj 179041), koji finansira Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije.

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Beograd, 2015

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Introduction to the problem of other minds: whose problem is it anyway?

She came quickly over to me and held out her hand. I looked at her full of distrust. Was she doing this freely, with a light heart? Or was she doing it just to get rid of me? She put her arm around my neck, tears in her eyes. I just stood and looked at her. She offered me her mouth but I couldn't believe her, it was bound to be a sacrifice on her part, a means of getting it over with."

(K. Hamsun, Hunger)

Most of us when reading this paragraph from Hamsun's novel have no trouble understanding young man's uncertainty. He is worried that even though the woman he is attracted to seems to share his feelings this might not be the case after all. He speculates that by being friendly and loving she only wants to end the awkward situation as soon as possible. This, of course, is his true fear and by anticipating this possibility he is already trying to ease his own heartache. By not letting himself to fully trust her he prepares for the worst. This suggests that he probably believes that it will hurt less if disappointment does not catch him unprepared.

All of the 'psychologizing' that this young man has done by questioning woman's motives and all of the 'psychologizing' that I have done by briefly analyzing his uncertainty is something we do on regular basis. It is hard to see how we would be able to go without such psychologizing even for a single day. Thinking about other people's feelings and thoughts, anticipating what they are going to do and how we are going to react seems to be essential for normal life. The human world without it would be a strange and unpredictable place. In such a world we wouldn't be able to make sense of other people's actions let alone to predict them. In turn we wouldn't be able to adjust our own behaviour, nor would we be able to prepare ourselves for the worst or the best. In such a world the well known phrase "I did not see it coming", the phrase that most of us have used at a certain point in our lives, would be universally applicable to all situations. It is hard to see how the fabric of social life could be maintained under such circumstances.

As we are all aware, everyday psychologizing is sometimes easy, sometimes hard. We often know with ease what other people are thinking and feeling. But, sometimes it gets so hard to figure out the motives behind somebody's actions that these others, even the closest ones, may look profoundly mysterious and strange to us. In these situations we can no longer make sense of these people. We are at loss as to who they are and wonder how we could reach the point of such extreme mutual misunderstanding. At such occasions we may feel that we have encountered some kind of problem of other minds as these others are all of a sudden impenetrable to us. But, this is not how philosophers have thought of this problem.

Traditionally, the philosophical problem of other minds has not been about our occasional unsuccessful attempts to understand other people. This may come as a surprise but traditionally the problem of other minds has not been about how we generally know what other people think or feel in different situations. In other words, philosophers have not typically been inquisitive about strategies that we use when we find out and acknowledge that a friend of ours is e.g. depressed or when we predict that a colleague will show up on time for the meeting. They have not been worried about how often we are right in our characterizations of other people's feelings and thoughts, nor

how often we get the right explanation of other people's behaviour or predict correctly what they are going to do next. Thus, philosophical problem of other minds has not been the problem related to the psychosocial mechanisms and strategies underlying our everyday psychologizing and as such it wouldn't be something that contemporary social and development psychology would deal with. Or, so it would seem at first sight.

Now, let's see what else this problem of other minds is *not*. Traditionally, the philosophical problem of other minds has not been about whether babies, plants, animals and computers have minds. Again, it seems that in these borderline cases we do encounter such a problem as all the creatures mentioned are in some respect similar to us but they are also in some important aspects different from us. So, it looks all so natural to wonder occasionally if dogs feel the same as we do or how the world looks like to a baby or if a highly intelligent robot would have the same inner life as we do. But, again, this is not how philosophers formulated the problem of other minds. Admittedly, questions of this kind have been closely connected to it and philosophers did have much to say about this subject, but for philosophers this has never been the crux of the problem of other minds that they are interested in.

Now, the question is what the philosophical problem of other minds is, if these aforementioned worries about other minds that we might occasionally experience are not it. In a nutshell, this problem is about *how I know if there were other minds like mine at all and how I could justify such knowledge*. It follows then that the question about whether someone and/or something has a mind does not arise only in the fringe cases of babies, computers, and animals, but it can be posed for other grown up fellow human beings who are in every respect similar to me. This radical question that opens up the radical gap between others and myself is considered to be the traditional philosophical problem of other minds.

Formulated in this way the question of other minds appears to be a textbook example of an epistemological question: it is the question about the nature and justification of our knowledge. Indeed, this particular knowledge is not the knowledge of the world of objects in general, but knowledge of the world of other people's minds. Now, how loaded this epistemological question is with particular, hidden ontology of mind is something to think about. However, it is important to take a note that this is not supposed to be a psychological question about how our mind works when making sense of other people, but rather it should be understood as an epistemological question about how justified is our belief that other people have minds. There is only one caveat to this: sometimes it looks that psychological and epistemological questions mix. That is to say that sometimes it seems that psychology is the answer to our epistemological worries while at some other times, if we dig deeper, it seems that epistemological worries do shape the way we think about our psychology. Moreover, sometimes we are not even sure if we are offering a psychological explanation of how we know what other people think and feel or if we are providing justification for our belief that other minds do indeed exist. This book, in a nutshell, is about this caveat. Let me explain.

In our everyday life we never worry about the very existence of other minds. While we can wonder whether our friends are truly as liberal minded as they say they are or if they are really happy as they say they are we never think of them as merely machines with no mental life whatsoever nor do we worry about the possibility that we are the only creatures with minds in the universe, unless of course we are writing a philosophy book or a science fiction novel. So, we can freely say that the traditional philosophical problem of other minds is solely a philosopher's worry and that in some special circumstances could become a part of pop culture and literature, but only for the entertainment purposes, provided that the writer

is talented. In other words, the nature and justification of my knowledge of other minds seem irrelevant for my everyday life primarily because my wonderings about other people (what they feel, think and why they do what they do) never touch on (not even closely) the question of if there are other people with inner mental lives. We start off with the assumption that such people do exist and this implicit assumption makes thinking about others possible.

Undermining this assumption has not been done outside of philosophy and even within philosophy it happened fairly recently. Some three hundred years ago Rene Descartes took an epistemological journey in order to find the secure foundation of all knowledge and all sciences. Along the way he put everything that he thought he knew into question until he was left only with the knowledge of the existence of his own mind. For Descartes this was the starting point in the reconstruction of the knowledge of the world. He proceeded to demonstrate that there is a God, that mathematical and logical truths unquestionably obtain, and that there is the external world we live in. Descartes believed that this journey helped him get a better sense of the true nature of this world as well as about the true nature of our knowledge of it. The problem of other minds was born on this journey and it is legitimate to ask what exactly in Descartes' philosophy gave birth to this problem.

Cartesian doubt, the nature of the indubitable truth and the conception of mind that Descartes put forth are certainly part of the answer. For Descartes, the mind (the 'Self' or the 'I') is in a position to know itself directly while the knowledge of everything else comes in the form of the representations (i.e. the ideas) our minds form. In other words, knowledge of the world, other people's minds, and God is gained indirectly, i.e. through inference. So, how do we know that other people have minds? According to Descartes, we infer that our fellow human beings have minds because they can talk. At the same time,

we infer that animals do not have minds because they cannot talk. Furthermore, we can be sure that they indeed have minds because God would not deceive us in such important matter. I will say more about Descartes' solution to the problem of other minds in the following chapter. For now it is important to notice that Descartes' epistemology along with his conception of mind opens up the possibility that this 'I' (the self or the mind) is alone in the universe while these other creatures that this 'I' perceives and has representations of are nothing more than mindless machines/bodies that appear to have minds but have no inner, mental life at all. This possibility is open because in Descartes' philosophy the only knowledge that is direct and immediate is the knowledge of my own mind. Nobody but me has this direct access to it. Or to put it differently, when it comes to my own mind my access to it is privileged. The others can only infer its existence in the same way I can only infer the existence of their minds. With the inference comes the possibility of error and along with it the highly unlikely possibility (but possibility nonetheless) that other people have no minds at all.

Descartes' epistemology and philosophy of mind did have profound influence on 20th century psychology and cognitive science. Indeed, as already mentioned, the question that occupied cognitive scientists and psychologists has not been the question of how I know that other minds exist but rather which psychological mechanisms allow me to understand and get to know what other people think and feel. However, their answers to the psychological questions regarding other people's minds reveal that most of psychologists and cognitive scientists of the twentieth century have been sharing Descartes' conception of mind. Or, to be more precise, their answers reveal that many of them have preserved essential features of Descartes' epistemology: namely, that our minds are epistemologically private, that we know them directly and that we need to develop some mechanism and strategies to get to know others. This point

requires some unpacking. So, let me say a bit more about the nature of the psychological question as well as the kind of answers that we have been offered by cognitive scientists and psychologists.

Far from being as awkward and obscure as the philosophical problem of other minds, psychological inquiry into our knowledge of other minds has been mostly concerned with the nature and origin of psychosocial mechanisms that we use to explain and predict other people's behaviour. If I say that my close friend will help me out should there be any trouble it seems reasonable for a psychologist to wonder how I know this. More precisely, it is the job of the psychologist to ask which psychosocial mechanisms and strategies I do use when making such prediction and how reliable such mechanisms are. Furthermore, it also seems reasonable for a psychologist to speculate and try to empirically investigate factors that make some people better at reading other people's minds than others. Of course, if we push a bit further we can also ask how these strategies and mechanisms develop as it seems that none of them are available to the newborn. Thus, there is a developmental question regarding our knowledge of other minds that is on developmental psychologists to answer. Finally, evolutionary psychologists can pose evolutionary question and ask about the evolutionary origins of social cognition.

As expected, cognitive scientists and psychologists did have a lot to say about human social cognition and they did provide a number of answers to the aforementioned questions. Among all of them several themes can be identified. One of the most influential positions regarding the nature and development of human social cognition starts off with the assumption that our social cognition is theory-like. This means that the way we predict and explain other people's actions is, in a nutshell, a theoretical process in which we postulate (invisible) inner, mental states in order to account for their behaviour. This practice is not unlike the practice in which we make sense of the external, physical world. That is, when we make sense of, say, the way objects move, we postulate certain hidden forces in order to explain the phenomena we perceive. Similarly, when faced with the complexities of the social world, in order to make sense of it we construct a theory to explain the particular phenomenon at stake, i.e. other people's behaviour. So, in order to understand such behaviour we hypothesize and posit that other people have feelings, desires, beliefs, opinions, worldviews, and the like. Thus, mental states become theoretical entities in our psychological theory in the same way as atoms are theoretical posits of a certain physical theory.

The other popular approach to social cognition in cognitive science and psychology has been the approach that conceives social cognition not as a theoretical activity but rather as a process of simulation. According to this view, our understanding of other people is not the result of theory construction but is shaped by our ability to put ourselves in the shoes of others. Of course, it comes as no surprise that a variety of compromises between these two opposing views have been proposed. I will come back to the brief overview of these positions in Chapter 2, but for now let me just pose the following question: How did cognitive scientists come up with these theories and which philosophical ideas, if any, had the most influence on them?

Once we start looking for the answer to this question it becomes clear that the philosophical problem of other minds, regardless of its obscurity, had substantial influence on contemporary psychological debate over the nature and development of social cognition. Or, to be more precise, once we begin detecting the historical roots of our psychological theories we cannot help but notice how the philosophical (epistemological) worry about our knowledge of other minds and the way we justify it has been shaping the way psychologists view the nature of psychological mechanisms responsible for social cognition.

One of the main goals of this book is to tell the story why and how this happened. But, to tell it properly several important storylines need to be identified and followed carefully.

Firstly, there is a conceptual part of the story that needs to reveal which ideas psychological theories and philosophical positions have in common. As I mentioned briefly earlier, most cognitive scientists and psychologists did explicitly or implicitly adopt the view that our mind is known directly only by us and that we get to know the external world including the psychological life of others through formation of cognitive schemes, concepts, ideas or, in a nutshell, through the formation of representations whatever their nature is. To put it differently, this shared assumption about how our minds work and how we gain knowledge of the world suggests that each of us is isolated from the rest of the world in a mind of our own. What we need to do then is to cognitively build bridges in order to reach the outside world and other people. Even though cognitive scientists and psychologists never ventured far enough to entertain the possibility that everyone else in this world is nothing but a chimera, they did assume that we need to develop some kind of psychological mechanisms to reach these others.

Secondly, there is an historical part of the story: i.e. there is a reason why the Cartesian view of mind has been dominating cognitive science and psychology for the last seventy years or so. This part of the story has its own twists and turns. At the beginning of the 20th century Cartesianism fell out of grace only to make a victorious comeback in the fifties. The reason why this happened lies in the developments of the 19th century Anglo-Saxon philosophy and early 20th century psychology. What basically happened in the first decades of the 20th century was that both philosophers and psychologists started to treat Cartesianism as unscientific. I am going to explore the underlying reasons for this novel attitude toward this old and fairly popular take on the human mind in the following chapter. For now

let's keep in mind that both philosophers and psychologists, pursued the argument that if psychology was to study people's minds, then it had to find some objective way of doing it. The only objectivity that psychologists of the time could find was in observing behaviour so the study of mind became the study of behaviour. Indeed, behaviourism in psychology did have deep philosophical roots and all kinds of epistemological and ontological assumptions were explicitly or implicitly packed into it. My story wouldn't be complete if I didn't say something about those as well. But, before I do, suffice it to say that it did look at the time that behaviourism could avoid the fate of the Cartesian (mentalist) psychology. However, in the mid twentieth century the climate changed. This was the time of the revival of the Cartesian view of mind and several factors contributed to it: first, there was growing awareness among psychologists of shortcomings of behaviourism. Secondly, about the same time the first computer was born. The cognitive revolution was on its way and with it came a new way of studying the mind. It is interesting to see how within these new trends the Cartesian mind lost its ontological status as a separate substance. Instead of being a metaphysical substance, the mind became the software of the computer. Both software and hardware are made in and of the same material stuff. Indeed, this was seen as the first step of the proper science of mind. However, the epistemology of this new science of mind remained deeply Cartesian. That is, its main assumption still was that each of us was an isolated mind and needed to form representations to make sense of the external world. How we develop the software necessary for such activity became the question of the day.

As one of my main goals in this book is to capture well conceptual as well as historical components of the story of other minds its first two chapters will be devoted to the philosophical and psychological approaches to social cognition. But, if I am to capture all the positions properly, I need to do some stage

setting. So, in the first chapter I will address philosophical and psychological predecessors of contemporary cognitive science and psychology. I will track down the roots of contemporary views of social cognition in Descartes' philosophy as well as in developments in philosophy and psychology at the turn of the 20th century. All of this is necessary if we are to understand properly how and why the philosophical debate about other minds took the shape that it did as well as why the main opposing psychological theories of social cognition did import the key features of philosophical disagreements. In the second chapter I aim to take a closer look at the philosophical and psychological theories. Here my goal is to expose their similarities; similarities not only among their stated, explicit positions but also among their hidden presuppositions. Thus, on one hand I will deal with two main classical philosophical solutions to the problem of other minds: the solution from analogy and the theory approach. On the other, hand I will survey two main sets of theories of social cognition developed by cognitive scientists: simulation theory and the theory-theory approach. As we will see despite different interests and goals the philosophical and psychological approaches are remarkably similar.

This brings me to the second half of this book and its other equally important goal, namely to relate these theoretical insights regarding other minds with the way we understand autism. In the final two chapters I examine the way different theories of other minds shape the way we understand autism or Autistic Spectrum Disorder (ASD) as well as how the studies in autism could potentially help us understand better the nature of psychological mechanisms involved in social cognition.

Thus, in the third chapter I deal with the way philosophical and psychological theories of other minds, the Theory-theory approach and simulation theory approach in particular, have influenced our understanding of the psychological deficiencies found in children with autism. But what makes individuals with

autism so interesting in the debate over the nature and origins of social cognition? The answer is that one of the key features of individuals with ASD is that they have trouble communicating and relating to other people. In other words, impaired social cognition is one of the defining features of this disorder.

Now, when we pause to take a closer look at the case of autism we cannot help but conclude that individuals diagnosed with it are the real life examples of individuals for whom the problem of other minds is as real as it can get. They have trouble reading other people's facial expressions and social cues which makes their social interactions markedly different from the normal case. That is, features of a social situation that are transparent to normal people can be invisible to them. Whoever has a family member with autism or has worked with individuals with ASD could attest to this. Most therapists could tell a number of stories where this peculiarity shows up. Carol Gray, the creator of Social Stories Therapy for people on the autistic spectrum happened to tell one such story that really stayed with me. In Chapter 3 I go over the details of definition and diagnostic criteria for ASD but for now let me tell Carol's story as her story illustrates well the problem of other minds that individuals with autism face on an everyday basis.

At the time Carol was working in a high school as a therapist. One of the teenagers on the spectrum that she worked with was Eric. He was a high-functioning high school student, who was doing well in behavioural therapy and so was mainstreamed into the general classroom. However, shortly after that a serious problem emerged. Eric would consistently interrupt teachers during lectures, and was disrupting the other students. Gray tried different strategies with Eric but none of the therapy was helping to stop this behaviour. In therapy sessions, Eric would acknowledge that he was interrupting, and pledged not to interrupt, but the next day he would interrupt all the same. Gray's breakthrough with Eric came after an incident during

a class assembly that was videotaped. As the speaker got on stage and began his presentation, Eric interrupted. He shouted over the speaker, ‘‘Yesterday they confused the schedule yesterday. Yesterday they confused the schedule—yesterday.’’ The speaker stopped and looked at Eric. ‘‘Yeah?’’ he said. Eric continued, ‘‘Yesterday [inaudible] confused the schedule.’’ The speaker replied, ‘‘Yeah? How many of you are confused? Several people. Teachers are confused. We have a number of us who are confused.’’

The auditorium was in an uproar with people laughing. Gray used this videotape to try to figure out why Eric was interrupting. In their next therapy session, she showed him the tape.

What follows is a transcript of a portion of that session:

CG: We have?
E: A speaker. Because I interrupted.
CG: An—oh, you are ahead of me now. And the speaker is talking to whom?
E: I don’t know.
CG: Talking to . . .?
E. Me.
CG: You. Right.
E: Yeah.
CG: Anybody else? Is he talking to anybody else?
E: No.
CG: He is, Eric.
E: Talking to anybody else.
CG: Yeah, he’s talking to about 500 students and you are one of the 500 students.

. . .

CG: And the speaker is talking to . . . who is he talking to?
E: Mr. [inaudible] Eric?
CG: Eric. But he’s also talking to who else.

E: Ummm. Brenda?
CG: Right. How many people is the speaker talking to?
E: Me.
CG: One? Is he talking to just one person?
E: Yeah.
CG: No Eric, he is talking to about 500 students.
E: Yeah.
CG: Not just Eric.
E: Excuse me.

. . .

CG: How many people?
E: Think hard?
CG: Yup. How many people were at that assembly? Lots?
E: Lots of people.
CG: OK.
E: I’ll write it down.
CG: Right. Not just Eric.

. . .

CG: Listen and tell me if you hear people laughing.

[Plays video]

CG: Listen.
CG: Tell me if you hear people laughing.

[Laughing]

CG: Are people laughing?
E: No. Yeah.
CG: You think?
E: Yeah?
CG: Do you think they laughed because you interrupted or did they laugh because there were changes in schedule?
E: They laughed because—because they cannot change—because they felt the same.
CG: OK, they laugh because they felt the same as you did?
E: Yeah.
CG: OK.

. . .

CG: A bunch of kids and 30 adults and Eric interrupted and everybody laughed, and the reason they laughed is be cause they felt the same as Eric did.

E: Yeah.

CG: OK, I'm going to explain the situation now to you, OK? And I want you to listen and see how my description is different.

E: Can I do it?

CG: No I'm going to describe it. I'm going to write it.

E: All right.

CG: (writing) You have kids . . . Eric interrupts . . . OK, and I think that everybody laughed because–

E: (interrupting) They felt the same.

CG: (writing) Eric interrupted and it's not right to interrupt a speaker at an assembly.

CG: OK there's your opinion, you think they laughed because they felt the same, but Eric I think they laughed because you interrupted. And they thought that was kind of funny.

E: (hesitating) Yeah, well, I can stop it. (Gray, 1996)

This conversation between Carol and Eric shows that Eric's interpretation of the recorded event is very odd to say the least. It reveals that he does not recognize basic facts about his social environment. It seems that Eric doesn't know that there are other people in the auditorium, and he is not aware that the speaker isn't directing his remarks to only him. It isn't even clear whether Eric realizes what Gray means when she says, ''No Eric, he is talking to about 500 students.'' Furthermore, Eric has problems saying what some of the speakers' words mean. For example, though he was trained using behavioural techniques not to interrupt, and though he promised not to in-

terrupt, from this incident Gray realizes that Eric doesn't understand the meaning of 'interrupt'. He can't understand it, in part because he doesn't see the distinction between a one-on-one conversation and a lecture to an audience. Another interesting thing to notice in this script is that Eric seems to attribute to other people the way he feels about this particular situation: if the others laughed, they must have laughed because they felt like he did. All of this points out to serious problems that Eric has when asked to engage in a bit of everyday psychologizing: psychologizing that comes all too natural to the rest of us.

But, how are we to explain such peculiar impairment? What are its causes and how come that Eric's social cognition seems to be the most affected while his other cognitive capacities are if not intact then at least far less impaired? After all Eric does communicate, speaks language, and was mainstreamed into the regular classroom. Nonetheless, other students and teachers remained a mystery to him and he seems to be unable to bridge the gap between himself and them. Moreover, he seems to be unaware of the very presence of other minds at certain times like the one during the school assembly. These are indeed very hard questions and there are a number of ways to tackle them. But, it is not surprising that the debates in philosophy, cognitive science, and psychology, the debates about the nature and origins of our social cognition, did influence the way this disorder has been understood. In Chapter 3 I explain how the Theory-theory approach to social cognition shaped the way psychologists understood and studied ASD for a long period of time. It would not be an understatement to say that one of the main Theory-Theorists, Baron-Cohen, did in fact bring the case of ASD to the centre of attention of developmental psychologists. Simulation theories did have less of an impact but its proponents have been using the case of autism in a variety of ways to support their theoretical positions.

This brings me to the fourth and the final chapter of this book. While a large chunk of it is devoted to the story of how philosophy and psychology historically mixed, the last chapter of this book is devoted to the ways they could potentially mix. In other words, historically speaking, the Cartesian view of mind in its various forms has been most influential in shaping the way psychologists and cognitive scientists explored and explained mind's capacities. However, this is far from being the only approach to mind. In the recent years many non-Cartesian, non-representational views of mind have been gaining on popularity. All sorts of views have been proposed: extended mind, embodied cognition, dynamic systems approach to mind and the like.[2] All of them contributed immensely to the development of new methods and strategies of studying mind, its origins and development, as well as to the new ways of understanding empirical data regarding our perception, cognition, affects, and even development of our motor capacities.

The final chapter does not aim to cover all of these approaches nor all of the areas of mind research. What this chapter explores, instead, is whether one particular approach to mind, that of the later Wittgenstein, could be more fruitful in our research and understating of mind in general and autism in particular. This exploration promises to be interesting for at least two reasons. For one, it will give us a clearer picture of how Wittgenstein's view of mind could provide a framework for better understanding of the nature and origins of social cognition and in that way how it could provide a better fit of the theory and empirical findings coming from research on autism. Secondly, it promises to yield a way to naturalize Wittgenstein's later philosophy and make it relevant to psychologists who have so far worked under assumption that Wittgenstein's take on mind and psychology was not only useless but also harmful.

2 For the extensive review see e.g. *Folk psychology re-assessed* edited by Daniel D. Hutto and Matthew Rattcliffe, 2007.

Thus, in the last chapter I plan to show the new promising link between philosophy and psychology that could lead us out of the worries emerging from clinical practice and empirical research on one hand as well as out of philosophical conceptual problems on the other. This potential mix could benefit all the parties involved: psychologists as well as philosophers.

Chapter 1
Cartesian mind: from Descartes to cognitive revolution

Even though Descartes lived some three hundred years ago his conception of mind outlived him for centuries. Admittedly, it went through some changes but nonetheless remained the most prevalent view of mind in the second half of the 20th century. In the modern version of Cartesianism Descartes' substance dualism has been abandoned. However, his epistemology became essential for the new and developing cognitive science of mind. What this means is that Descartes and most cognitive scientists share one of his key assumptions regarding the nature of human mind, namely, that the mind needs to form representations of the outside world in order to make sense of it. For Descartes these representations were ideas of the mind to which the mind has access, while for cognitive scientists such representations are formed on the subconscious level but nonetheless enable us to understand and gain knowledge about the world around us. The striking feature of both views is that whatever the nature of representations is, the mind needs to build them in order to bridge the gap between us and others. Due to this shared assumption, cognitive scientists face the problem of other minds in the same way as Descartes used to. It is not surprising then that their solution to this problem, as we will see in the next chapter, do mimic traditional philosophical solutions to the problem of other minds. However, before I turn to the details of the philosophical and psychological positions regarding the existence of other minds and nature of social cognition, it is important to see how cognitive science ended up with the Cartesian take on mind and its problems in the first place.

Thus, in the following sections I plan to unpack crucial steps that led to this essentially Cartesian, yet modern conception of mind. For this purpose it seems necessary to present in more detail Descartes' original position: what it involves, how it gives birth to the problem of other minds, and what kind of solution it offers. Then, I plan to turn to the 19th and early 20th century developments in philosophy and psychology. The survey of what was happening during this period is of great importance for our understanding of cognitive revolution as it reveals how and why Cartesian mind lost its popularity at the turn of the centuries only to regain it in the years after the WWII.

1. Descartes and the problem of other minds

Descartes' conception of mind along with the problem of other minds that accompanies it is born on Descartes' skeptical journey. For Descartes the goal of this journey is to find and secure the indubitable foundation of all knowledge while the chosen vehicle of the journey is methodic doubt. Given that Descartes described his epistemological quest for the indubitable truth in *Meditations on First Philosophy* (1641) it is all too natural to begin this section with a closer look at them. After reviewing the main steps of the methodic doubt and Descartes' insights about mind's faculties, as laid out in the first two Meditations, I will digress a bit and say more on the nature of Descartes' and Ancient skeptics' doubt. Admittedly, doubt and skepticism have been around for a long time before Descartes, so the question of why only Descartes hit upon the problem of other minds is an interesting one. Even though the Cartesian conception of the mind and the problem that arises with it may come as intuitive to us nowadays such intuition was foreign to philosophers before the 17th century. This indeed has something to do with Descartes' new born conception of mind and his overall methodology. Here I want to point out how important it is to remind ourselves that the skepticism regarding the existence of other minds is only three hundred years old and is really specific and confined to a particular view of the human mind.

Aside from reaching indubitable truth, Descartes in his *Meditations* also spells out his conception of the nature of the

human mind: its ontological status and its epistemology respectively. I turn to these issues next. On one hand, ontologically speaking, mind is a special substance. On the other hand, when we ask epistemological questions about how the mind knows the world, Descartes tells us that the mind is representational. This means that a) the mind is made of special material (*res cogitans*) that is different from the material that extended objects are made of (*res extensa*), and b) that the mind has the capacity to understand the world through the ideas (representations) it forms. The latter became the trademark for the Cartesian mind. The other important feature of the Cartesian mind, also hinted at in Meditations and developed further in the *Passions of the Soul* (1649), is its separation from the (bodily) affects. Both of these features of the Cartesian mind I want to explore closer as they did stay with us in contemporary cognitive science. Finally, I want to end this section on Descartes with the short analysis of his solution to the problem of other minds. This solution has the key elements of the main solutions to this problem of other minds that are going to be carefully crafted in the centuries after Descartes.

a) Method of doubt and the faculties of Mind: *Meditations on First Philosophy*

For Descartes the goal of philosophy is twofold: philosophy is to provide a reliable method of all sciences as well as to outline the basic principles of reality. This means that a philosopher needs to be concerned with epistemological as well as ontological questions. The importance of the philosopher's work goes beyond philosophy, namely it is pivotal for the development of special sciences. This is primarily because the right method and the truths of special sciences depend highly on the philosophical insights. More precisely, it is on the philosopher to establish through careful philosophical inquiry both: the scientific method and the basic metaphysical truths. Now, such inquiry begins with doubt that is to be systematically applied to everything that we hold or could hold true. This is why Descartes' doubt is usually called universal and methodic. As Descartes progresses through his Meditations he does allow for some initially doubted knowledge to gain certainty.

In his first meditation Descartes poses the question of how certain is the knowledge that we think we have and he sets out to examine if any knowledge could potentially withstand the power of our doubt. If among all kinds of knowledge we find an indubitable one, then all our sciences will finally get a secure foundation. The first kind of knowledge that Descartes examines, (and shortly after concludes that cannot be the paradigm of certainty), is knowledge that we receive from our senses, that is, empirical knowledge. So, what makes this knowledge doubtful? Descartes convincingly argues that we have

experienced sensory deception so many times where our eyes or ears mislead us into believing that something is the case, but upon closer inspection it turns out not to be so. We see a stick plunged in the water as broken but when we pull it out we realize that it only looks broken. We see a tower in the distance as round but when we get closer we realize that it is, in fact, square. Descartes concludes: "I have noticed that the senses are sometimes deceptive; and it is a mark of prudence never to place our complete trust in those who have deceived us even once" (1641/1999, p. 60). So, the first kind of knowledge to be suspended for the time being, according to Descartes, has to be knowledge coming from senses.

However, the question is do we have to suspend all of it? After all there are many cases of sense perception where it seems very unlikely that we are wrong. In other words, in many occasions we can be fairly certain that the way the world appears to us is the way the world stands. For instance, the very fact that I am sitting in my room now writing these sentences looks indubitable to me in the same way it looked indubitable to Descartes that he was sitting beside the fireplace in his room while writing *Meditations*.

But, what if, Descartes continues, all of this is nothing but a dream? What if there is no outside world whatsoever? What if we have no physical bodies at all? What if we only think we see the world and sense our bodies while we happen to be dreaming all of this all along? This scenario does seem possible if not plausible and since it is possible, Descartes proposes that we leave aside all the knowledge coming from the senses. This is a precautionary measure only. We will decide how to evaluate it and what to do with it once we reach the indubitable knowledge. What is certain so far, though, is that experiential knowledge cannot be the ground of our certainty.

Now, is any knowledge left for us to think about if we give up the knowledge from experience? The answer is 'yes'. So

far we have doubted all that we hear, see, touch, taste or smell. We have even doubted the existence of our own bodies. However, some truths seem to remain truths regardless of whether there is the external world of material things or not. Truths of mathematics and logic hold even if we dream everything else. Mathematical and logical propositions do not tell us anything about the existence of the world, and accordingly their truth or falsity does not depend on anything in the world. In other words, mathematics and logic lay out certain principles that are true regardless of whether the world exists or not. These principles seem indubitable.

But, are they really indubitable? Let's explore this further, advises Descartes. There is one way to doubt even the propositions of mathematics and logic and that is to "suppose an evil genius, supremely powerful and clever, who has directed his entire effort at deceiving me" (p.62). This is what is usually called 'hyperbolic doubt'. By making this move Descartes allows the possibility that there might be some powerful God-like being that could confuse us even in regard to the knowledge that looks the most secure to us, i.e. the knowledge that we think we perceive clearly and distinctly such as knowledge of mathematics and logic. With this overwhelming doubt to which no knowledge is immune Descartes ends his first meditation.

To pick up where he stopped Descartes begins his second Meditation with a pessimistic possibility. He asks himself: "What then will be true? Perhaps just the single fact that nothing is certain" (p. 63). But, he quickly continues: "I have persuaded myself that there is absolutely nothing in the world: no sky, no earth, no minds, no bodies. Is it then the case that I too do not exist?" This is the point where Descartes finds the first indubitable truth: "But doubtless I did exist, if I persuaded myself of something."(p.64) Even if there is an evil demon, "there is no doubt that I exist, if he is deceiving me." (p. 64).

So, Descartes first indubitable truth: "'I am, I exist'" is necessarily true every time I utter it or conceive it in my mind." (p.64) In other words, no matter how much I doubt, I must exist: otherwise I could not doubt. In the very fact of doubting my existence is manifest. I may be deceived when I judge that material things exist. I may be deceived about what is real and what is dream. I may be deceived about the truths of mathematics. But, I cannot doubt my own existence. This is privileged truth, which is immune from corroding influence of both: natural doubt and hyperbolic doubt.

In the rest of the second meditation Descartes explores further the nature of this "I" whose existence he couldn't doubt even if he wanted to. He concludes that this "I" must be a thinking thing that "understands, affirms, denies, wills, refuses, and that also imagines and senses" (p. 66). However, even though Descartes uses the term 'a thinking thing' he does not as yet make any ontological claims about the very nature of the thinking substance. As far as he is concerned at this point it still could turn out that the thinking thing is a kind of material thing. The reader will have to wait until Meditation six to find the arguments why thinking and material substance must be two different substances.

Having reached the indubitable truth and identified the mind faculties, Descartes is eager to revisit once again the reasons why he seems to be more certain about the nature of this 'I' while very often the nature of the material things seem to be so much more clear and distinct than the powers of the mind that he just analyzed. To demonstrate how this is the case he uses an example: namely, he asks how we know that a piece of wax is the same piece of wax through all its changes. It's not that the senses tell us that this is one and the same piece of wax. On the contrary, senses suggest that every time wax changes its shape it becomes different thing. However, we perceive it as the same piece of wax through the mind. In this way the very

perception is not a matter of senses but of mind. “Thus what I thought I had seen with my eyes, I actually grasped solely with the faculty of judgment, which is in my mind” (p.68). Descartes concludes his second meditation by restating the claim that our knowledge of our own minds is the most certain knowledge that we could have: ”For since I now know that even bodies are not, properly speaking, perceived by the senses or by the faculty of imagination, but by the intellect alone, and that they are not perceived through their being touched or seen, but only through their being understood, I manifestly know that nothing can be perceived more easily and more evidently than my own mind” (p.69) Once he established the indubitable knowledge Descartes moved on in the following meditations to regain the certainty of mathematics and logic and our knowledge of the world.

But let me pause here and digress a bit. I would like to revisit some points regarding the difference between the doubt that appears in the writings of the Ancient skeptics and the methodic doubt of Descartes. This analysis is important as it will show that the problem of other minds is not a universal skeptical problem but arises from the particular philosophy of mind.

b) The nature and purpose of Doubt: Skeptics and Descartes

As we have seen in the previous section at the beginning of his *Meditations* Descartes proclaims that he is about to take a skeptical journey in order to see if we are able to have any firm, indubitable knowledge. He decides to put aside all the knowledge that could be in any way doubted. It took him only one meditation to conclude that the only secure knowledge that we could possibly have is the knowledge of our own mind. The world and the other minds remain outside of it.

Nowadays it looks almost intuitive to us that once we take the skeptical journey and start doubting our knowledge we need to go all the way through and doubt the very existence of the world as well as the existence of other minds. In other words, it seems inevitable that once we are on this journey we need to go through the same steps and reach the same insights as Descartes did. But, let us pause here and ask an interesting question: if these steps are part of every skeptical journey why is Descartes considered to be the father of the problem of other minds? After all, skeptics have been around long before Descartes. So, why is it that none of them seemed to find the existence of other people’s minds doubtful? Or as Anita Avramides puts it: “If we were to think that skeptic has standard repertoire, then we would expect the skeptics of all times to raise this question of other minds. It would come as something of a surprise, then, to learn that, on the whole, the sceptics of ancient times did not raise this question” (2001, p. 21). Their skeptical journey was different from that of Descartes for several reasons. Avramides summarizes these reasons as follows.

Ancient skeptics, regardless of whether they belonged to the Academia or the Pyhronnian School, did doubt that we could ever reach the criterion of truth: the criterion that we could use to determine if certain states of affairs obtain. In other words, their main contention was that we could never know how the world stands. They were aware that the way we get to know the world is primarily through our senses. Now, the question is how reliable our sense are. Even upon brief inspection it becomes clear that people differ in their perceptions. Furthermore, it becomes clear that people and animals have different perceptions. Also, all our senses present the world to us differently. For our eyes the world consists of shapes and colours. For our nose the world consists of smells, while our skin tells us that the world is all about hot and cold, slippery and hard surfaces. So, the question is why should we believe that any of our senses provide a correct picture of the world? They all yield different perceptions after all. If we take these points seriously it becomes very hard to imagine what the universal criteria for measuring reality would look like. Thus, Ancient skeptics, concluded that there was no good reason to believe that we would ever settle the question of what the world really looks like. The lesson that they wanted us to take home was that we should refrain from making any definitive judgments about the world.

However, it is of great importance to notice that the skeptics of the Ancient world never doubted the very existence of the external world, only our ability to find a common criterion for judging how that world stands. As Burnyeat puts it: "All these philosophers, however radical their scrutiny of ordinary belief, leave untouched – indeed they rely upon – the notion that we are deceived or ignorant about *something*. There is a reality of some sort confronting us; we are in touch with something, even if this something, reality, is not at all what we think it to be. Greek philosophy does not know the problem of proving in

a general way the existence of an external world." (Burnyeat in Avramides p. 27.)

Another point about the Ancient skeptics is worth mentioning. For them theoretical speculations about how secure our knowledge is, need to have practical implications. Along with other Hellenistic philosophers they were concerned with the ways we could achieve happiness in this life. As they held that uncertainty about the world is unavoidable, on a theoretical level they prescribed a recipe for a happy life that had this uncertainty as its main ingredient. So, they argued that if we give up the idea of reaching secure knowledge we will be in a position to avoid all the tensions that we find ourselves faced with when trying to determine if something is the case or not. Instead of solving such dilemmas (as there is no positive way out of them) we should be holding back our judgment altogether. As for our everyday life, skeptics advised us to live it according to appearances. They thought that this should be sufficient for a happy life free of torments.

Ancient skeptics did inspire Descartes. However, as we have seen Descartes' own interests were somewhat different from theirs. First of all, Descartes wasn't interested in skepticism as the main goal of epistemological journey, but rather in finding secure knowledge against all imaginable doubt. For him the purpose of the journey was scientific knowledge and progress. Secondly, Descartes was not interested in the values that the theoretical research would have for everyday life. How to live a good life was a question that in Descartes' time fell out of the scope of philosophical interests.

Now, in his attempts to push the limits of doubt (with the goal to doubt everything that is *possible* to doubt and see if any knowledge is left indubitable after such scrutiny) Descartes engages in several thought experiments. As we have seen he asks himself if he could imagine a hypothetical situation in which he is nothing but a delusional character who believes that the

material world exists while such a world is nothing but a dream. As it turns out, Descartes could imagine such a situation and as a result he puts aside as suspect all empirical knowledge. When he makes a step further and comes up with the possibility of an evil demon, he engages in a similar thought experiment. That is, he asks if he could imagine a situation in which mathematical and logical truths were false. Again, as it turns out, he could.

Thoughts experiments of this kind were foreign to Ancient skeptics. Their goal was not to find indubitable truth but to point out the reasons why we cannot have certain knowledge about the world. They never used methodic doubt the way Descartes did. Thus, they never arrived at the point in which they would doubt the very existence of the external world and other minds. This very possibility never occurred to them as they never had the need to engage in the Cartesian thought experiments. Another interesting point to keep in mind here is that Ancient Skeptics never reached the conclusion about the mind that Descartes did. Namely, they never thought of the mind as solitary and isolated that needs to reach (via its faculties and representations) the world and the others in the world. The methodic and radical doubt that we find in Descartes, in fact, pushed him to embrace this particular new conception of mind that the Ancient world did not know of.

All of this points to the fact that the Cartesian philosophy with its goals and methods, (philosophy that that did yield a specific view of mind and the problem of other minds) is a philosophy that has emerged in a particular period of our history. Even though the Cartesian way of thinking might seem universal now, it is far from being so. This point is worth remembering as the Cartesian view of the mind seems to be often taken for granted as the only take on the mind that makes sense. This was especially the case in the early days of the cognitive revolution. Having said this it is time to go back and explore

further the Cartesian mind along with the presuppositions that implicitly or explicitly go along with it.

c) Cartesian view of the mind: presuppositions that lasted for centuries

The process of methodic doubt that led Descartes to the first indubitable truth has also led to the particular view of the mind and the self. Even though the first two meditations might look as an innocent epistemological quest regarding the foundation of all knowledge, its implications for the way we understand our mind and cognition are far reaching. Two main implications are worth mentioning. Firstly, according to Descartes the mind is representational and literally outside of the material world of objects. Secondly, the mind is mainly equated with its cognitive capacities whereas emotions or affects remain part of the physiological processes of the corporeal body. Both theses about the mind, that the mind is representational and that the mind is cognition, even if slightly modified, will be accepted and advanced in 20th century psychology and cognitive science.

As we have seen, for Descartes, the mind is a thinking thing. By the end of meditations six, Descartes shows that 'a thinking thing' is a separate substance from the material world of objects. The way the mind gains knowledge about this world is through the formation of the ideas or representations. Some of these ideas are clear and distinct while others are not. But, not only is the mind made out of a distinct substance from material objects, it is clearly distinct from its own body. By removing mind from the body and its motor activity Descartes offers a conception of mind as something that is external to the world, devoid of action, whose capacities could be affected by the processes external to it but nonetheless follow its own

laws. The mind as such perceives the world, so to speak, from the outside and forms somewhat static representations of it. Admittedly, such representations could be used to direct the actions of the body but action and perception are two different activities: the former belongs to the body, the latter to the mind. Or to put it differently, the mind is not immersed in the world. It can definitely interact with it, and make changes in it, but it lies outside of it. The relation between the mind and the world seems to be fairly straightforward. The ultimately non-deceiving good God, whose existence Descartes hopes to have proved in the third meditation guarantees this.

So, for Descartes, there is the objective world out there. The mind forms more or less accurate representations of it. In the fifth and sixth meditations Descartes spells out the criterion of accuracy of our representations. They are accurate when they capture the world as described by logic and mathematics. They are somewhat inaccurate when they concern qualities that are not mathematical in nature such as taste or colour. But, the latter we form in order to survive in this world as the mind/body union. These representations, the ones that are clear and the ones that are unclear do serve as guidelines for action.

As for emotions they remain part of the body. According to Descartes, the bifurcation between emotions and cognition (i.e. mind) is a radical one, because it is the bifurcation of two different substances. Emotions being outside the mind's realm are conceived as essentially bodily processes; they are automatic and can lead to (i.e. cause) inner feelings. Within this view, mind and emotions perform different functions, namely the mind becomes responsible for the knowledge of the outside world, while emotions (being different from the mind's faculties) are responsible for how we feel about the world.

This view of mind has persisted in various forms in many psychological theories of the twentieth century. The only Cartesian thesis that everyone gave up readily was Descartes'

substance dualism. Everything else, the representational mind as well as the cognition/emotion bifurcation has been incorporated into the modern cognitivists views of mind that rose with the cognitive revolution in the mid - twentieth century. I will have to say more about this in the chapters to come, but before that let me explore further how the problem of other minds emerged within Cartesian philosophy and whether Descartes' had the solution for it or not.

d) Descartes' solution to the problem of other minds

Avramides convincingly argues that in Descartes' writings we could find the predecessors of both traditional solutions to the problem of other minds (Avramides chapter 2.p. 45). Based on Descartes writings we could be tempted to conclude that Descartes would certainly argue that our knowledge of other minds comes from the analogy with our own mind. But, at the same time Descartes might seem as advancing the view that our knowledge of other minds is the same as our knowledge of the world and that it is in a nutshell of theoretical nature. Avramides argues that it is none of the above. According to her, Descartes must have thought that we know that other people have minds and be certain about it because a) God is not a deceiver and b) them having minds seems to be the most plausible hypothesis about the causes or reasons lying behind their complex behaviour. In other words, God would not mislead us into believing that other people have minds if this weren't the case. We do form such belief about others, the belief that they have minds and mental life similar to ours primarily because we know that our own mind and body are connected in a particular way. We are aware of this connection and conclude that such a connection must obtain in other people as well. But, what would be the evidence for such a conclusion and can we make a similar conclusion about animals? As for the first question, our knowledge that God is ultimately good and not a deceiver suffice to justify our knowledge of other minds. The second question about the existence of animal minds or rather the very answer that Descartes gives is very interesting. So the question

is, if we ascribe minds to other people can we ascribe minds to animals as well? After all, many animals do behave as if they do have some kind of mind and inner feelings.

For Descartes the clear evidence that there is a mind behind a certain body is the ability to use language. Since there is no sign that animals could use language we are justified to conclude that they do not have minds. If it were the case, Descartes proceeds, that animals had a language of their own (as some thought they have) they would be able to make whatever they are saying understandable to us in the same way we humans can make ourselves understandable to others despite the fact that we speak a variety of languages. Moreover, Descartes argues that even less fortunate human beings who cannot speak can make up a system of communication and express their thoughts. Nothing even remotely similar is happening with animals. Therefore, Descartes concludes, it is not the case that they have minds on their own and that they think (Discourse on Method, Chapter 5). This leaves only humans to be the creatures with both bodies and minds.

The main point to remember in this discussion on animal minds is that according to Descartes, animals have no less reason than men. Instead they have no reason at all. To have a mind to a higher or lower degree was not possible within Descartes' substance dualism. So, for Descartes, either you have the mind or you don't have it: you cannot be somewhere in between. This has one interesting implication, namely given that animals have no mind at all (and accordingly do not have the capacity to sense and imagine) Descartes needs to conclude that they cannot feel pain. The claim that animals feel no pain was counterintuitive in the 17th century almost to the same degree as it would be today. Ever since Aristotle, through the Middle Ages and Renaissance all the creatures in the universe, living and non living, formed the Great Chain of Being (see Lovejoy, 1936/2009). This Great Chain of Being guaranteed the continuity between them. Furthermore, there were several kinds of souls out there: vegetative, animal, and rational. Indeed only humans possessed all three but animals did have two of them, (vegetative and animal), which enabled them to feel pain. With Descartes and his substance dualism this continuity was broken and only one kind of soul was left. That was the mind with its cognitive capacities. Other kinds of souls were lost to the material substance and were subsumed to mechanical laws. In other words, they were not souls at all anymore.

This unpleasant and counterintuitive consequence of Descartes position, namely that animals cannot feel pain, was left to his followers to make sense of, as was the problem of the body-mind interaction for that matter. But, I will not be going in that direction and will leave it to other philosophers of mind to write or rewrite the history of these problems. I want to explore something else instead. As I have already announced some of the main Cartesian presuppositions about the nature of the mind and knowledge have been accepted in the cognitive science and psychology in the 20th century. Not surprisingly, the solutions to the problems of other minds that we have already seen in Descartes have been further developed in philosophy, psychology, and cognitive science of the 20th century. Let me now turn to some of the historical reasons why and how that happened or more precisely let me turn to the predecessors of the cognitive revolution.

2. Predecessors of the Cognitive Revolution

> "The task of a psychologist trying to understand human cognition is analogous to that of a man trying to discover how a computer has been programmed. In particular, if the program seems to store and re-use information, he would like to know by what 'routines' or 'procedures' this is done".
>
> (U. Neisser, 2014, p.6)

Neisser's quote captures well the research program of the early days of the cognitive revolution when the computer metaphor of the mind was becoming increasingly popular in psychology. Since then, in the next sixty years or so, this metaphor has been attacked and revised on a number of occasions. Thought experiments have been carefully crafted and empirical evidence has been gathered to strengthen or to weaken this metaphor while some of the empirical studies were guided by it. Along the way the very metaphor underwent some changes. Thus, an artificial network has replaced analogous computer. But, in order for any of this to happen some stage setting had to be done beforehand. The work in several areas was crucial for the cognitive revolution of the mid twentieth century. Early developments in psychology and other sciences as well as the work of logicians and philosophers of the late 19th and early 20th century contributed substantially to the cognitive revolution of the mid 20th century. The goal of the next several sections is to tell an abridged version of the story how philosophy, logic, and psychology came together to make cognitive science.

a) The birth of psychology

In the 19th century the interest in the study of mental events was on the rise. It seemed at the time that the proper way to study our inner life was by studying sensation and neural impulses. Among those who showed interest in this kind of research, physicists took the lead. Gustav Fechner studied the relationship between external stimulation and internal sensation while Herman von Helmholts studied the speed of neural transmission. In the same period Ernest Weber was engaged in similar research while E.S Donders measured the time required for stimuli discrimination (for a review see Gardner, 1985).

With all this new research under way it was becoming obvious that there was a need for a discipline that would focus exclusively on studying thinking processes. As a result, the first lab entirely devoted to the research of our mental life was established. Wilhelm Wundt was the initiator and the head of the first laboratory of experimental psychology in Leipzig. The lab started to work in 1879, which is now taken to be the official year when scientific psychology was born. A couple of years later Edward Titchener did the same at Cornell University in the USA.

What was the goal of this newly born science? Obviously, the goal was to study the mind, its structure, and its processes. This, however, was remarkably similar to the explorations about the mind that occupied philosophers long before the first psychology lab was established. How did, then, this newly born psychology differ from philosophy? Since the subject matter was the same, the difference had to come in the method of investigation. Philosophical armchair speculations were not

good enough anymore. So, instead of relying on philosophy, the first psychologists thought that the right method of the science of mind needed to be modeled after the method of natural sciences, primarily physical chemistry. As physical chemistry aimed to discover the elementary particles of various materials and the laws governing their combination, new experimental psychology was meant to look for the main elements of mind and the laws of thinking processes.

As it happened, the first experimental psychologists (known as structuralists) belonged to the tradition of British empiricism. Together with Locke, Hume, and Mill they held that the foundation of all cognition lies in sensations and that all of our knowledge is built out of such sensations. So, they thought that their main goal was to decompose complex experiences into a conglomeration of several more elementary sensations. They applied the same strategy to the reasoning processes. The goal was to break down more complex reasoning processes into the basic ones: the ones that the whole cognition is composed of. Thus, what sructuralists were after were atoms of thought and the laws of combining the thoughts. In the tradition of British empiricists they also reduced these laws to the law of association. In the next section it will become clearer that the search for the basic elements was somewhat in the spirit of the day, namely philosophers at the turn of the centuries were also in the quest to find the hidden underlying logical structure of language and the basic elements of meaning.

Now, if the method of psychology is to be modeled after physical chemistry and if we are to analyse the experience into its basic components how should we proceed? What would it mean to use the scientific method on inner processes? Having no place else to look, structuralists proposed the method of introspection: somewhat stylized to be fair but introspection nonetheless. They trained their subjects in a specific and well defined language so that their reports on inner sensations were

comparable and had standardized meanings. These were precautionary measures to avoid ambiguities and misunderstandings in reports.

However, the method of introspection had incurable problems. No matter how careful you are to design the language that will arguably avoid all the ambiguity and vagueness in the language of self-reports the question remains: Can you really discern the elements of thought by close reflection? Furthermore, very quickly it was clear that by relying on introspection and self reports the agreement about the basic elements of thought could not have been reached, primarily because different people reported different sensations as elementary. But, at the end of the day, introspection as a method failed mostly because it violated the basic premise of scientific research, namely that both causes and effects of the studied event have to be publicly observable. In the first labs of experimental psychology what was presented as stimuli to the subjects was certainly publicly observable. However, the effects (i.e. sensations that subjects would experience) were not. Thus, if the two people happened to disagree about their internal sensations it was impossible to determine whose report was more accurate. Behaviourism was the response to these worries.

Behaviourism started with the claim that the real scientific object of a psychological study is stimulus and response (i.e. behaviour that we can all observe) not mental states. Now, in order to better understand why we behave the way we do and to have a real science about it we need to get rid of mentalist terms and explanations that rely on them. Or, at least, we should get rid of them when we are doing science. After all it was not possible to build science on something that only one person could see and behaviourists were going to fix the mistake structuralists made.

There was no consensus among behaviourists about whether mental states exist or not. Some of them like J. B. Watson

denied altogether that there was anything like consciousness while others thought that mental phenomena are only epiphenomenal (i.e. side effects) of underlying physiological processes. Either way mental states were irrelevant for real psychological study.

Regardless of some disagreements behaviourists universally held the following principles:

- The causes of behaviour are strictly environmental. Hence, there is no need to invoke mentalist terms to account for it.

- Overt behaviour is the only legitimate object of scientific study since overt behaviour is all we could all see.

- The goal of psychological investigation is to discover the laws and principles governing the prediction and control of observable behaviour. Given that all causes of behaviour are coming from the environment and that there are no unobservable ones, behaviourists thought that this was more than manageable.

- And, finally, for behaviourists, learning can be explained by two primary mechanisms. First, there is associative learning when we associate new stimulus with old responses through stimulus substitution such as the case of Pavlov's dogs. Second, there is reinforcement when the subject is being rewarded or punished for the desirable and undesirable behaviour respectively. B. F. Skinner favoured the latter and developed the whole theory of language acquisition based on it in his famous book *Verbal behaviour* (1957).

All of these principles, despite their scientific aim and look, suffered from major problems. Namely, despite all the good will to provide convincing behaviourist explanations of high cognitive functions, behaviourists failed to do so and this has become apparent by the mid of the 20th century. So, in the landmarks of the rising cognitive revolution we can find the fierce critique of behaviourism such as Chomsky's famous critical review of Skinner's *Language behaviour*. His critique revealed

all the shortcomings of behaviourist explanations of language acquisition. But, even before Chomsky and the cognitive revolution, Gestalt psychologists had been aware of these shortcomings.

Gestalt psychologists criticized both structuralists and behaviourists for trying to explain complex psychological phenomena by simple mechanistic principles. They came up with the examples of the non-reducible phenomena (e.g. optical illusions) that could not be broken down into simpler sensations and accordingly were not explainable by mere association, associative learning, or reinforcement. Also, their interest and focus somewhat differed from that of structuralists' and behaviourists'. Their aim was to study complex cognitive capacities such as thinking, problem solving, and perception. Unlike structuralists and behaviourists, Gestalt psychologists started off with the assumption that our higher cognitive processes are not composed of simpler ones and that our cognitive apparatus is rather a top down active process: where our cognition plays an important role in organizing incoming stimuli. However, they did not have a proper research method and had to rely on highly questionable self-reports to study, for instance, the major steps of problem solving. (see e.g.K. Duncker, 1945).

However, the problem of the appropriate method of study of complex cognitive processes had to wait for the cognitive revolution in order to be solved. Cognitive scientists of the fifties started to utilize a different, more reliable and more exciting method in their study of mind. Self-reports were the thing of the past. Their method was shaped by developments in thenewly born field of computer science. But, before I come to the computers and computer metaphor for the mind, a bit more stage setting is required. The birth of the first computer would not have even been possible without the work of the logicians and philosophers at the turn of the century. I turn to their story next.

b) Logic, theories of meaning, and the birth of logical positivism

Roughly speaking there have been three main requirements for the cognitive revolution to happen. In order for a computer to become a metaphor for the mind as well as to be invented at all, the work of early logicians and development of formalized languages were of crucial importance. Furthermore, a particular take on how human language functions and how its propositions get their meaning had to be somewhat elaborated. Finally, as we have already seen in the developments in psychology, a particular view of what constitutes a proper scientific explanation had to be specified. All these requirements have been advanced in the work of logicians and philosophers of the late 19th and early 20th century. Not surprisingly they have been developed almost simultaneously and have been endorsed and advocated by the very influential Vienna school where logical positivism was born. But, what drove these developments and what was the motivation behind them? I cannot hope to cover all the factors that have shaped and contributed to the linguistic turn and the early analytic philosophy but I will try to point out at least to a few crucial ones.[3]

The role that the foundational crisis in mathematics played in the early days of formal logic and the developing theories of

3 For the extensive review of the birth of modern logic see e.g. Martha Kneale, William Kneale, *The Development of Logic*, 1962. For the very useful overview of philosophy of mathematics and theories of meaning in the early analytic philosophy see M. Dummett, *Frege-Philosophy of Language*,1981. For more details on the foundation crises in mathematics see e.g. S. Shanker, *Wittgenstein and the turning point in philosophy of mathematics*, 1987 and M. Marion, *Wittgenstein, finitism and the foundations of mathematics* 1998.

meaning cannot be overstated. One particular aspect of it, the one related to the emergence of the non-Euclidian geometries, was of great importance.[4] New developments in geometry were the result of the mathematical discovery, a discovery initially made by Gauss, that Euclid's 5th postulate (that states that two parallel lines will not intersect in infinity[5]) could not be proved. In fact, as it turned out the systems based on the opposite postulate happened to be consistent. These discoveries brought about non-Euclidian geometries. However, the influence of these discoveries has not remained within the field of geometry but was strongly felt outside of it, namely in the neighbouring field of logic and philosophy. As we know from history of philosophy, for many philosophers, (such as Descartes, Spinoza, Leibniz, Kant to name just a few) geometry was *THE* paradigm of certain, indubitable knowledge. With the emergence of non-Euclidian geometries the certainty of this knowledge came under attack. This simple fact had enormous impact on the way philosophy has been done in the following decades.

As philosophers have been always on the quest for certain knowledge they felt that something had to be done about

4 Development of the non-Euclidian geometries contributed to the foundational crises. However, other developments in mathematics and logic are associated with this crisis too. Jose Ferreiros (2008) distinguishes several phases in the crises. The first one (taking place around 1870) is marked by the discussions on acceptability of non-Euclidian geometries. The second one (starting in the early 20th century) is marked by debates about set theory, the concept of continuum, the axiomatic method and intuition. By 1925 logicism, formalism, and intuitionism (as opposing schools and research programs) have been formulated. Finally, in the decade before WWII Godel proved his incompleteness result which had to be accommodated.

5 The original postulate is as follows: *If a line segment intersects two straight lines forming two interior angles on the same side that sum to less than two right angles, then the two lines, if extended indefinitely, meet on that side on which the angles sum to less than two right angles.* The version usually used is Playfair's. It states: *In a plane, given a line and a point not on it, at most one line parallel to the given line can be drawn through the point.*

this new uncertainty undermining geometrical knowledge. Although philosophers such as Frege and Russell[6] shared the belief that geometry could not been saved any more, they intended to come up with the way to save arithmetic. They started with the assumption that in order to save arithmetic we need to ground it, i.e. derive it from basic logical axioms. These axioms in turn would have to be certain in some better way than the axioms of Euclidian geometry. What this means is that the truth of logical axioms had to be established differently than the truths of Euclidian geometry. This will ensure that they do not have the same fate as geometry. Securing logical axioms and proofs became one of the main goals for Frege, Russell, and early Wittgenstein. Once this is done, they believed, it would make sense to try to derive arithmetic from logic and save it from some possible future disaster.[7]

In order to accomplish this goal the first thing these philosophers had to do was to find the secure foundation of logic and the necessity of logical proofs. Now, what they could not do for this purpose was to use our intuitions. In other words, they realized that if they wanted to secure the necessity of logical truths they could not justify such necessity by relying on our psychological mechanisms, the way we do derivations, and the way we know them. Intuitions were not a reliable source of knowledge any more since our intuition regarding the fifth postulate misled us into believing that this postulate was necessarily true. But, how could Frege and Russell avoid using intuitions?

The first step toward this goal was to make logical proofs

6 For the review of the developments of early analytic philosophy, particularly the important role that Frege, Russell, and early Wittgenstein played in it see e.g. S. Shanker ,1989.

7 The project to derive arithmetic from logic, later known as logicism, turned out to be problematic. However, the theory of meaning that Frege, Russell and early Wittgenstein developed and that was related to their logicism project, became extremely influential in the 20th century.

formal, primarily because such formal proofs could be executed by something like a computer, i.e. by a machine that does not have human mind and human experience. The main requirement for such formal or mechanical proofs is that they do not have any gaps in the way they unfold, gaps that need to be bridged by our intuitions. If we leave such gaps in the reasoning the machine that does not share our intuitions would not be able to complete the proof. Now, the question was: what kind of logic would be suitable for this job? Certainly, this was impossible to do within the framework of the traditional Aristotelian logic that was primarily done in ordinary language. Ordinary language suffers from all sorts of problems that prevent us to make derivations without intervention of our interpretations, reasoning, and intuitions. This means that in ordinary language it is virtually impossible to have the reasoning with no gaps in it. Such language is often vague and ambiguous. It lacks precision and is often full of all sorts of type violations.

To correct all these deficiencies Frege formalized language in which logic was done.[8] But, what does exactly mean to formalize ordinary language? Frege, basically, took and redefined mathematical function and applied function theory to our language, or more precisely to propositions of our language. According to Frege, the essence of language is to be a function theoretic calculus. All well-formed propositions of the language could be analyzed as the propositions of such a calculus. This could be illustrated in the following way:

Mathematical function
2 (function)
a) 2 = 4 (value)
(argument)

8 In a sense what he did was to combine Aristotle's categorical logic with Boole's logic of truth functions. Formalization of the Aristotelian logic only would be of little value and would not result in formal logic that we know of today.

Mathematical function as applied to linguistic proposition
b) S is P. (S = argument, 'is P' = function; true or false = value)

With such formalization of logic the first step toward the birth of the first computer was made as formal logic was the prerequisite for the developments of formalized computer languages. But formalization of logic opened up the way for something else as well: namely, for a development of referential and compositional theory of meaning; a theory of meaning that was going to become crucial for the doctrine of logical positivists.

The referential theory of meaning was not new in the late 19th century. J.S. Mill has already developed his denotation theory according to which the meaning of the word is the object it denotes. Mill focused on proper names and believed that if we could find out how proper names hook up to reality we would be able to apply these findings to other words and provide an explanation how language and the world relate in general. So, according to Mill the meaning of a proper name is merely denotation or its referent. We find and learn this relation between a name and an object in simple association. As we can see along with the denotation theory, Mill offers a psychological theory of how we learn the language. Not surprisingly, his psychological theory belongs to the tradition of British empiricism.

Both Frege and Russell were concerned with two problems of Mill's denotation theory. Firstly, Mill's theory cannot explain what appear to be empty names. Names such as "unicorn" or "elf" fail to have referents. Or, in other words, objects they denote do not exist. Secondly, if the meaning of the word is its referent then there are no non-trivial identities. 'The Morning star is the morning star' is a trivial identity, but 'The Morning star is the evening star' is a non-trivial identity. However, if the meaning of the word is its object, "the morning star" and "the evening star" have the same meaning. When we identify that

the stars in question are one and the same planet, namely Venus, Mill's denotation theory tells us that we have learned nothing new. However, this does not seem right because it seems uncontroversial that we did learn something that we did not know before. We thought that we had two objects in the sky now we know that there is only one.

In order to fix the latter problem Frege introduced the distinction between sense and reference. So, for him two names could have the same referent but two senses which would then account for the cases such as the morning and the evening star. Russell, also dealt with the apparent names and suggested that any apparent name should be broken down into its components. Once we do that we should look for their referents in our experience. So, if we follow this strategy and want to check e.g. if the word "unicorn" has a meaning we would need to break down the imagined creature into its components: legs, tail, horn and the like. If the elements refer to real objects, then "unicorn" is a meaningful word. Only proper names that fail to have referents after this careful analysis would be pronounced senseless. These would be the only words with no meaning. Such analysis was going to become very popular among logical positivists whose main goal was to eliminate metaphysics from sciences and thought that this was a convenient way to do it.

In addition to refining Mill's denotation theory of meaning Frege developed the compositional theory of meaning. The Compositional theory of meaning aimed to explain how our propositions make sense. For Frege, all elements of the sentence must combine to make up the sense of that sentence in the same way as argument and function in arithmetical proposition get their sense and value. But, in order for our language to function as this kind of calculus, every word has to have a precise sense. That is, the sense of each word has to be determinate. What this means is that we have to be able to provide

necessary and sufficient conditions (i.e. a definition) for every concept we use. Based on such definition we have to be able to determine whether an object belongs to the defining category or not. If there are concepts that have no clear definitions (boundaries) we will not be able to assign the truth-value to propositions in which they occur. Such propositions would be then defective. Both Frege and Russell hoped that proper logical analysis of every proposition would discover the underlying logical form of that proposition as well as to determine sense of every concept in that proposition. They believed that even though our everyday language could be vague and ambiguous, proper logical analysis would clear up all confusions.

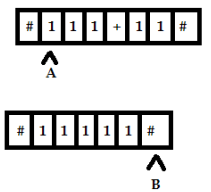
Logical positivists of the Vienna circle wholeheartedly embraced such analysis. Their main goal was twofold: firstly, logical positivists wanted to separate sciences from metaphysics, and secondly, they wanted to unify all sciences. Logical analysis as developed by Frege, Russell, and early Witttgenestein was considered to be the most important tool in achieving these goals. The crux of their position was that proper scientific research is nothing but the attempt to empirically prove or disprove particular proposition regarding the state of the world. In order to do this, the proposition itself needs to have truth-value, i.e. the claim itself needs to be capable of being true or false. Of course, only propositions that have determinate sense are of this kind. According to logical positivists, logical analysis should help us figure out if there are some senseless propositions that scientists identify, and if there are, scientists will be advised to get rid of them as such propositions cannot be a part of a proper scientific theory nor research. Everything that could not be empirically checked was proclaimed to be, strictly speaking, senseless and as such was discarded as useless. The whole of metaphysics was considered to be of this kind. Furthermore, logical positivists believed that logical analysis would help us translate all propositions from higher sciences

into the propositions of the basic sciences. What this meant was that ultimately all scientific theories could be translated into the physical theory. This also implied that all the levels of reality were considered to be reducible to the physical level.

As we have seen logical positivists and their understanding of science had profound influence on the very young and struggling science of psychology. Behaviourism in psychology was a response to the positivist requirement that all meaningful propositions (all that are allowed in a proper scientific research) need to be reducible to something verifiable. Given that none of the concepts involved in the way we talk about our inner life passed these requirements the whole inner mental life needed to be sacrificed. Logical positivists, like Carnap, insisted that the only proper and meaningful psychology could be about human behaviour simply because only the talk about human behaviour made any sense. Of course, our mentalist way of describing our inner lives shared the destiny of metaphysics. It was proclaimed to be strictly speaking senseless, useless, and misleading. However, as we have seen, behaviorism had its insurmountable shortcomings. But, fortunately around mid 20th century a revolutionary invention was made. The first computer was born and along with it an entirely new approach to the human mind.

One of the key players in the invention of the computer was Alan Turing. He was particularly interested in the process and the nature of computation. Similarly to the logicians of the 19th and early 20th century, Turing set out to find the way to formalize computation. But, what does it mean to formalize computation itself? Is it not the case that we do the computing in a formalized language already? The answer is that we do, but the problem is that in order to do it properly we need to know the meaning of the numbers and the functions involved. So, in the same way that Frege, Russell and Wittgenstein wanted to avoid our intuitions in the foundation of logic, Turing wanted to

formalize the very process of computation so that a machine that has no knowledge of the meaning of the numbers or functions could do it. What he did was to define computation in terms of the rules of computing regardless of the content that is being computed. (Picture 1[9] illustrates how a simple Turing machine would do the adding of two numbers (2 and 3 in this case) and illustrates the rules that such machine follows in order to reach the correct amount.)



Instruction 1: If read-write head is in machine state A and encounters a "1", it moves one square to the right, and the head stays in state A.
Instruction 2: If the head is in state A and encounters a "+", it replaces it with a "1", stays in state A, and moves one square to the right.
Instruction 3: if the head is in state A and encounters a "#", it moves one square left and goes into machine state B.
Instruction 4: If the head is in machine state B and encounters a "1", it deletes it, replaces it with a "#", and halt.

Picture1

Now, even a brief look at the instructions for adding that a simple Turing machine follows shows that such rules are not the ones that we follow when we do addition, or at least they are not the rules we follow on a conscious level. What is remarkable about the instructions of the Turing machine is that they are indifferent toward what is being computed. What machine is doing (adding, subtracting, multiplying etc.) and what these symbols MEAN is entirely irrelevant for the program that does the work.

9 The instructions for the Turing machine and the illustrations are taken from A. Clarke, 2001, p. 12-13.

Turing's formalization of computation was crucial first step in building artificial intelligence and the first computer. Without such formalization no computer program would ever be made. Following Turing's work, Claude Shannon (1948) found the way to quantify information. He realized that it was possible to represent any information in a binary code and that the medium to do this was electronic circuits. Why? Because all propositions that carry information can have two values: they can be true or false. Electronic circuits also have only two states: on and off. That is, a circuit is open or it is closed.

Following these principles, John von Neumann constructed the actual machine that could run on its own. That was the first machine that could actually perform certain operation (e.g. do the calculation) without a human being deciding when and how to proceed. Indeed, human beings did do the programming but once the programme was installed on the machine, the machine could run on its own.

It's not surprising that it wasn't too long before the analogy between the first computer and the human mind/brain was made. Given that it was at this point clear that logical reasoning in information processing terms could be presented in a binary code Warren McCulloch and Walter Pitts (1948) proposed that since neurons also operate as binary units (either they fire or they do not) they could be thought of as logical units carrying information. So, the scientific study of mind became possible because mind became a special kind of a computer.

Within this new framework it became possible:

- to study the mind in a scientific manner (i.e. to study mind without relying on intuitions, unobservable mental states such as internal sensations and self-reports). What you do instead is analyse what our mind does and try to figure out what kind of program it must have in order to perform such function.

- to explain cognitive capacities within a materialistic framework but avoid simplistic reductive mechanisms (such as reinforcement, conditioning, and the like). What this means is that in order to make sense of the way our minds work we do not have to go back to the Cartesian mentalism (or other sorts of 'mysticism'). If our brain is hardware and our mind is its program our entire psychology is explainable in physicalists terms. This in turn means that our mind as well as our body is scientifically explainable in the same say as a computer and its programs are.

In the following decades the computer metaphor of the mind went through several stages. It went from analogue computers to complex artificial networks. So, what kind of a computer or computer network our mind is became more elaborate over the years. Only in the last several decades the whole metaphor of the mind as a computer(s) was put into question. I will say a bit more about this in the next chapter.

It is not surprising that the computer metaphor of the mind did have a great deal of influence on the way philosophers as well as psychologists conceptualized the nature of human social cognition. Also, it is not surprising that Descartes' problem of other minds did find its place within these new trends. Let me elaborate this point a bit more.

Even though the view of the mind that was advanced in the cognitive revolution was not exactly the same as the one proposed by Descartes, nonetheless it essentially remained Cartesian. During this period a somewhat forgotten Cartesian representational view of mind went through its Renaissance. Indeed, the nature of representations changed. While for Descartes the representations that the mind creates to make sense of the world are formed on the conscious level, according to cognitive scientists these representations are formed on a subconscious

level[10], i.e. the level of the program. These programs that we are not aware of enable us to perform sophisticated functions, such as facial recognition, language production and comprehension, physical reasoning, social cognition and many others. These programs can do this because they are the programs that, in a nutshell, sort out the incoming stimuli in the proper clusters and help us form a coherent picture of the world.

Also, even though the new scientific approach to the mind dropped Cartesianism when it comes to the ontology of the mind or the specific nature of our ideas, it nonetheless presupposed that the mind is locked and isolated from the rest of the world in the very Cartesian way. So, in order for the subject to make sense of the physical and social world this subject needs to form proper representations of it. Within this framework the old epistemological problem of how we get to know that other people have minds and how we can justify such knowledge pops up immediately. So, the solution to this problem became very Cartesian as well. Two dominant ways to account for social cognition developed: one that conceptualizes our social cognition as essentially theoretic activity and the other one that conceptualizes our social cognition as our ability to imagine how it is to be the other person. Both have the roots in the philosophical approaches to the problem of other minds and I turn to these issues in the next chapter.

10 This level is not to be confused with Freudian concept of subconscious. While we can through psychoanalysis became aware of this level, no analysis can help us became aware of the subconscious level cognitive scientists talked about.

Chapter 2
Epistemology and psychology of other minds: The Cartesian way

As we have seen in the previous chapter, Descartes' methodology of doubt made the whole material world of objects disappear into the uncertain. Along with it other minds disappeared too. Over the course of the following centuries two main philosophical approaches to the problem of other minds have emerged: approaches that accept the main tenets of Cartesiansm and the ones that reject them. So, on one hand philosophers who work within the Cartesian framework aim to avoid the pitfalls of skepticism even though they accept Cartesian assumptions about the nature of mind and the way it cognizes the world. Along with Descartes these philosophers argue that we have neither real reasons nor grounds to really doubt the existence of other minds. We do have reliable methods for establishing that they are out there and real. Indeed, as we will see shortly, what these methods are differ among philosophers of this provenience. On the other hand, in the 20th century the non Cartesian solutions to the problem of other minds began to take shape. Philosophers of this camp have been mostly influenced by Wittgenstein's late work. Unlike Cartesians they argue that Descartes' basic assumptions about the mind need to be abandoned. Once we abandon Cartesianism we will no longer face the problem of other minds.

In this chapter I unpack the Cartesian solutions only and leave the non Cartesian ones for the last chapter This is primarily because psychological theories of our social cognition that I turn to in the next section echo in many important ways these Cartesian themes, whereas Wittgensteinian approaches had little or no influence in cognitive science and psychology. It is my contention that Wittgensteinian solutions have been unjustifiably ignored; how and why we should correct this I elaborate in the concluding chapter. In this chapter, however, I confine myself to explain how the 'argument from analogy' and' the hypothesis approach' in debates about knowledge, justification and skepticism regarding other minds have shaped psychological theories such as Theory-Theory and Simulation theory.

1. Knowledge of other minds and how to justify it

Before I move to the philosophical solutions of the problem of other minds let me summarize how, in a nutshell, this problem arises. What follows are its most important steps. In order to fight the skeptic, philosophers need to deny one or more of the claims cited below.

a) I feel a sharp pain, see a red scarf, taste bitter coffee, hope to see a friend, and the like. All of these are mental events.

b) Mental events are subjective and belong to my mind.

c) Mental events and physical manifestations of mental events are not the same. I can fake that I am well when I am in terrible pain. I can fake that I am in pain when I am not. In this sense mental events and physical manifestation of these events are contingently, not logically related. In this light, the causal connection between the two is also rather dubious.

d) I know my mental states directly.

e) If I am to know that other people exist and that they have mental states too, there are two options for me: either I somehow need to become them and see that they exist and have their experiences from within or I need to have a reliable method for concluding that they exist and that they have experiences similar to mine. The Skeptic argues that both options are illusory. If I became the other person then these experiences would be mine and thus not hers or his. Furthermore, there is no method that I can develop that will remove the very possibility of doubt.

f) Therefore, I cannot know that other people exist and have minds.

It is not surprising that both philosophical (Cartesian) solutions to the problem of other minds deny the second part of e), i.e. the claim that there is no reliable method for overcoming doubt. They both state that there are such methods but disagree about their nature. But, before I turn to the classical Cartesian approaches that regained popularity in the cognitive revolution let me say briefly how philosophers and psychologists solved the problem of other minds within (logical) behaviourism. Indeed once behaviourism went out of fashion behaviourist solution was in need of replacement.

a) Behaviourism

As we have seen in the previous chapter, logical positivists of the Vienna circle used the logical analysis of language as a tool in distinguishing science from metaphysics. Their main goal was to show which propositions of our language have meaning and which ones are meaningless. Those that, due to careful logical analysis, turn out to be senseless must be abandoned for the sake of proper scientific research. For the purposes of such analysis, logical positivists had to embrace a particular theory of meaning which clearly stated that only words for which we can show that refer to some kind of a physical event or phenomenon (an event or phenomenon observable by many) have meaning. Now, it seems that within the Cartesian framework our words for mental events have their meaning because they refer to inner mental states. For logical positivists the main problem with this picture is that inner mental states are only observable by one individual. This very feature renders such words meaningless unless we can show that they get their meaning in some other way.

In order to make our talk about inner mental life meaningful, Carnap (1956) argues that all mental terms need to be translated into physical terms, i.e. into terms that describe our behaviour. If this is the case, i.e. if our talk about mental life is in fact talk about our behaviour then we do not face the problem of other minds. That is, in such a case reading the body language of other people is the same as reading their minds. So, if we are faced with a person who is breathing heavily, has a frown on their face, and talks in a raised voice, we can justifiably conclude that they are angry primarily because the

concept of 'anger' refers to nothing more than bodily manifestations. The same goes for pain, joy, excitement and the like.

As we have seen the main presuppositions of logical behaviourism had far reaching implications for the science of mind, i.e. psychology. Behaviourists did embrace the thesis that the proper study of mind had to be the study of behaviour even when they disagreed about whether inner, private mental states existed or not. Even if such states did exist there could not be a proper study of them. So, for behaviourists the right way to get to know other people (the way they think and feel) is through careful observation of their behaviour. Behaviour is all we have when faced with others, but luckily according to behaviourists, behaviour is all we need.

The main problem with the (logical) behaviourist solution is that it implies that our knowledge of our own inner mental states is somehow inferred from our behaviour. That is, the behaviourist solution implies that in order to find out how we feel, we need to check our heart rate, the level of perspiration, and our own facial expressions. Now, our intuition tells us that something must be wrong with this picture. It seems uncontroversial that we do not observe our own behaviour in order to find out how we feel. As a matter of fact it seems to be the case that knowledge of our thoughts and feelings is not at all related to the way we behave. As we have noticed already we might be good pretenders and fake our inner feelings well while being aware of how we really feel. The other problem with the behaviourist solution is that it implies that we are always in a position to know if other people are angry, sad, happy, and the like. We only need to read their behaviour. That is, as meanings of the terms referring to mental states are equated with the terms referring to behavioural states it seems that we cannot be mistaken when it comes to our knowledge of the mental states of others. Again, this seems false. Namely, we know that there is a possibility that somebody is in pain but does not exhibit pain

behaviour. We are aware of this possibility from our own case. Now, this is the possibility that logical behaviourism needs to accommodate.

Modified behaviourists such as e.g. P. Ziff (1970) insist that behaviour needs to be understood in a broader sense than physical movements. That is, they argue that analysis of behaviour has to include physical, social, and cultural context as well as verbal behaviour. When we include all of the above we are in a better position to evaluate our conclusion if someone is really in pain or pretends to be in pain. Small discrepancies between what the person says and what their physical behaviour tells us will reveal to us if the person is lying or not. However, the problem arises again. If the perfect pretence is possible how can we account for it in behaviourist terms? How can we refer solely to behaviour (whether it be in social, cultural context along with the all the patterns of the persons' past behaviour) to identify such perfect pretence?

These problems along with other general trends in philosophy and cognitive science after WWII have led philosophers to search elsewhere for the solution to the problem of other minds. The Cognitive revolution of the fifties contributed substantially to the revival and further developments of the classical Cartesian answers to this problem known as the argument from analogy and the 'hypothesis' approach. These are the positions that I turn to now.

b) Analogy

The person usually credited to be the first to formulate a fully developed argument from analogy is John Stuart Mill (1872). His epistemology is closely connected to his psychological theory. The main goal of the latter is to explain how we get our knowledge about the world and people. At the same time his psychology serves his epistemological goals, namely it is to justify our knowledge.

For Mill there are two kinds of knowledge: knowledge based on our intuitions that we get directly through consciousness and knowledge that we get through inference. It is the philosopher's job to discern between the two as: "… we may fancy we see and feel what we in reality infer. A truth, or a supposed truth, which is really the result of very rapid inference, may seem to be apprehended intuitively" (System of logic, 1891, Introduction 4). Now, the interesting question is: Which psychological processes underlie and make these types of knowledge possible? Mill's answer is that there are two main capacities of our mind. Firstly, the one that allows us to feel current sensations and imagine conditions that would make us feel certain sensations. Secondly, the one that enables us to make associations of ideas due to which we are able to make sense of the word, perceive regularities, and among other things, learn language. Based on these two capacities we are able to gain knowledge about the world. So, what is this external, material world for Mill? It is a permanent possibility of sensation. Thus, on one hand we are aware of possibilities of sensations coming from the world, while on the other, we are aware of possibilities of the variety of our inner feelings.

So far Mill's psychological theory seems to account for two kinds of knowledge: our knowledge of the world and our knowledge of our own mind. But, what about other fellow creatures with a mind like mine? Do I have knowledge about them too? And if so what kind of psychological mechanisms make such knowledge possible?

Mill says:

> By what evidence do I know, or by what considerations am I led to believe, that there exist other sentient creatures; that the walking and speaking figures that I see and hear have sensations and thoughts, or in other words possess Minds?...I conclude that other human beings have minds like me because, first, they have bodies like me, which I know in my own case to be the antecedent condition of feelings; and because, secondly, they exhibit the acts, and other outward signs, which in my own case I know by experience to be caused by feelings... I must either believe them to be alive or to be automatons... and by believing them to be alive, ... I bring other human beings, as phenomena, under the same generalizations which I know by experience to be the true theory of my own existence. (J. S. Mill, An Examination of Sir William Hamilton's Philosophy, 1872, 243-244)

This paragraph provides the answer to both of the above questions. It tells us something about the nature of our knowledge of other minds (that it is based on analogy and induction) as well as about the nature of psychological processes involved in such knowledge (i.e. it describes the mechanism of association that enables us to become aware of the connection between our body, feelings, and behaviour). Mill's argument as stated here also has all the necessary components of a traditional argument from analogy. So, what does Mill do? First, he acknowledges that other people have bodies. Then, he draws

our attention to the connection between our own bodies and sensations we feel. Without a body, he states, we would not be able to feel. Furthermore, feelings do make us behave in a particular way and we are more than aware of this connection from our own experience. Now, we do notice that other people often behave in a similar fashion. From there we can conclude either that they are in every other respect as we are but that they are automatons, i.e. that they lack feelings, or we can conclude that that they are like us: human beings with feelings. For Mill the latter is more likely to be the case. He concludes that our knowledge of other minds should be subsumed under the same kind of generalizations that we make about ourselves based on such experience.

To summarize, according to Mill, our knowledge about other people's minds is based on the analogy that we make between us and them. So, we and what we know about our own mind is the model for what we can conclude about others. In this way Mill's argument represents the classical argument from analogy. However, there is more to it than mere analogy. Mill insists that the conclusion about others that we reach *via* analogy can be subsequently verified by further observations. This makes his argument inductive as well. Mill says:"If the evidence stopped here the inference would be but a hypothesis; reaching only to the inferior degree of inductive evidence called Analogy. The evidence, however, does not stop here; for... I find that my subsequent consciousness presents those very sensations, of speech heard, of movements and other outward demeanor seen, and so forth, which being effects or consequents of actual feelings in my own case, I should expect to follow upon those other hypothetical feelings if they really exist: and thus the hypothesis is verified. It is thus proved inductively that there is a sphere beyond my consciousness. " (J.S. Mill, *An Examination of Sir William Hamilton's philosophy*, p. 260 footnote). Thus, Mill does two things in his argument.

Firstly, based on analogy he forms the hypothesis that other creatures have minds similar to ours. Then, he proceeds to confirm this hypothesis through subsequent numerous sensations. Repeated ongoing experiences make this inductive argument a good one.

At this point, we can ask what kind of implications Mill's epistemology and psychology has for the way we conceptualize the relation between our inner mental life and our behaviour. We can find the answer to this question in Russell's version of the argument (1970). Russell argues that there is a causal relation between our inner mental states and outer behaviour, a relation that we are able to observe directly. Based on this observation we infer that a similar connection obtains in other people.

> From subjective observation I know that A, which is a thought or a feeling, causes B, which is a bodily act, e.g. a statement. I know also, that whenever B is an act of my own body, A is its cause. I now observe an act of the kind of B in the body not my own, and I am having no thought or feeling of the kind A. But I still believe on the basis of self-observation, that only A can cause B. I therefore infer that there was an A that caused B, though it was not an A that I could observe. On this ground I infer that other people's bodies are associated with minds, which resemble mine in proportion as their bodily behaviour resembles my own. (Russell, 1970, p. 7)

By following this line of reasoning Russell formulates his postulate: "If, whenever we can observe whether A or B are present or absent, we find that every case of B has an A as a causal antecedent, then it is probable that most B's have A's as causal antecedents, even in cases where observation does not enable us to know whether A is present or not." (p.8).

However, causal connection between my thoughts and feelings, on one hand, and my behaviour on the other does not obtain every time even in my own case. Even if it did it would not be certain that it does apply to other people. Thus, Russell concludes that causal connection when it comes to others cannot be inferred with certainty. However, it can be inferred with high probability. To fight the skeptic, high probability is all that we need, though. Or so Russell thought.

Some philosophers, such as Hampshire (1970) and Slote (1970) did find the observation of causal connection between our mental states and behaviour (as it supposedly happens privately, inside each of us) highly problematic. However, they were not ready to reject the analogical argument. So, instead of trying to defend this version of analogical argument they proceeded to argue that we do have a reliable method for concluding that other people think and feel but such a method does not rely on us being able to perceive causal connections between our mental and physical (behavioural) states.

In order to avoid relying on the causal connection between mental events and behaviour in his argument from analogy, Hampshire develops another version of it. He argues that we are in a position to observe how other people make inferences about our own inner feelings and thoughts. Now, given that we are in a privileged position to check if their inferences are correct we could adopt their strategy of reading other people's minds provided that we find their strategy reliable. Thus, the analogy here is between their method of inference and my method of inference. According to Hampshire, this suffices to solve the problem of other minds.

For Plantinga (1970) the main problem with any inductive version of the analogical argument is how we associate mental states and a particular behaviour. If our method of sampling behaviour and mental states is the very method of categorization of mental states and behaviours then, Plantinga argues, our

method of sampling is biased and unfair. In other words, we should be able to collect data independently from the method of inference we use in understanding other people's minds. If they collapse into one then we have a problem with our inductive argument.

To answer these various worries Slote develops yet another version of the analogical argument. His solution relies on our perception of correlation (rather than causation) that obtains between mental and behavioural states. He examines the relationship between pain and pain behaviour in his own case and concludes that each pain-behaviour as far as he is concerned has been accompanied by real inner pain or pretend pain. After examining all these cases there is no reason to doubt that in the case of others anything different happens. Thus, when I see some other body exhibiting pain behaviour (and it is not me who feels or pretends to feel the pain) I can conclude that there is at least one other mind. According to Slote this is no different from the method used in the sciences.

Despite these attempts, many philosophers have not been convinced that the argument from analogy could be saved and have offered solutions that either step out of the Cartesian framework entirely or give up some of its fundamental points. All versions of the argument from analogy face the problem of the sample. One of the main worries in all of them remains unanswered, namely that our reasons for believing in other minds are based on the sample of one, i.e. on observations of ourselves. Even the version offered by Hampshire that aims to establish the analogy between our method of making sense of others and their methods in making sense of us suffers from the same problem. It presupposes that we conclude that their method is reliable upon inspecting our own internal mental states. As we know, a single case is always a poor inductive base. But, a devastating blow to the argument from analogy came from Wittgenstein's famous private language argument (1953).

If we follow Wittgenstein carefully we are led to conclude that it is not clear how we can intuitively detect the relationship between our inner feelings and thoughts and outer behaviour without publicly shared language. This language enables us to identify and categorize these inner feelings and thoughts in the first place. In other words, without publically shared language we would not be able to intuitively know ourselves and relate our inner life to outer behaviour let alone apply this knowledge to the case of others. However, Wittgenstein and Wittgensteinian solutions will need to wait for the concluding chapter. In the next section I turn to yet another Cartesian approach to the problem of other minds.

c) Hypothesis

Philosophers who wanted to avoid the pitfalls of analogical argument but nonetheless intended to keep the main Cartesian presuppositions about the mind, developed the position according to which our knowledge of other people is best understood as consisting of hypotheses that aim to explain certain phenomena, i.e. other people's behaviour. As we will see in the next section this position became the most prominent approach to social cognition in cognitive science. For now let me briefly elaborate two versions of this position as developed by analytic philosophers: H. H. Price (1970) and Paul Ziff (1970).

In developing his position Price starts off with the thesis that the best way to make sense of our knowledge of other minds is through the analysis of our language and the way it functions. So, what is exactly happening when we hear someone talking? On the very basic level we notice that they are producing some sounds. If they are speaking in our language we can interpret these sounds, i.e. these sounds are meaningful to us. This means that the uttered sounds combine into meaningful propositions that can be true or false and are informative. Now, how can we explain the fact that other people are indeed able to speak in sentences that we can understand? It is reasonable to assume that these words are formed in their mind; a mind that is in every respect similar to mine. But, why would we conclude this? When we take a look at our own case we become aware that when we speak we usually want to express some inner mental state or process. From here we can freely conclude that a similar thing is happening when other people speak. So, when they tell us that they are in pain there

is no reason to doubt that they are reporting to us what kind of mental state they are in.

It is clear that Price's solution is essentially Cartesian with all the Cartesian assumptions about the nature of our mind. Furthermore, his position is similar to most versions of the argument from analogy. It states that we can have a reliable method for getting to know that other people have minds. He also seems to be relying on the privileged access that we have to our own mind. Even though Price does not argue that we make conclusions about others based on analogy it does seem that according to him the very hypotheses that we postulate, we postulate by some sort of analogical reasoning where our own mind and behaviour are the model for the others.

Ziff develops his 'hypothesis' position somewhat differently. He starts off with the following problem: If we had in front of us a mindless body that is able to produce all the words and behaviours as we are how can we explain such a creature? That is, if such a creature existed we would not be in a position to explain its existence at all given that we would not have the slightest clue as to how such a creature is able to behave like us without the very crucial feature that we have: i.e. our inner, mental life. So, by keeping this insight in mind, we have no choice but to conclude that the hypothesis that other people have minds is well supported by many observations and evidence that we gather from experience. The other possible hypothesis, namely that we differ from others only with the respect that we do have minds while others do not have minds seems highly unlikely. The thesis that other minds exist is a part of the whole web of theories about our physical and social world. This thesis does not stand alone. It's a part of the wider conceptual scheme and as such is the best, most coherent, simple, and complete theory of other people.

There are many critiques of this position. Most of them are coming from Wittgensteinians and I will say more about them

later. However, let me just turn briefly to Plantinga's commentary. He argues that if we accept all the Cartesian presuppositions about the mind, it is not clear how we can confidently claim that all the evidence that we gathered points to the existence of other people's minds when we can easily conceive of the situation in which an Evil Genius created me and a number of mindless bodies around me just to play a practical joke on me. We can argue that this hypothesis is also simple, coherent, and complete. Plantinga asks: "How does it follow that, in my total evidence, it is unlikely that I am unique in having a mind?" (1970, p. 189). The obvious answer to these worries would be that the hypotheses about others as well as the evidence that we gather is no worse off than any other scientific hypotheses. So, if we are not likely to accept 'outrageous' hypotheses over the 'sane' ones in other disciplines why would we be inclined to do it in the case of other minds?

Since, the'hypothesis' solution to the problem of other minds has been developed further by cognitive scientists I would like to end this section on justification and epistemology of other minds here and turn to the next problem: namely, the nature of the psychological mechanisms involved in social cognition. As we will shortly see the debates over the psychosocial mechanisms have not diverted very far from the epistemological debates.

2. Other minds: psychological mechanisms

In the previous section we have dealt with the philosophical question of other minds. As we have seen, this question is about justification of our knowledge that other people's minds exist. Even though some of the proposed alternatives invoke some psychological mechanisms underlying our social cognition, their primary goal has not been to unpack all the strategies we use to understand other people but rather to invoke such mechanisms in order to justify our knowledge of other minds. In cognitive science and psychology, however, it is never questioned that other people have minds and that we know that they do. This part is taken for granted. The main question for psychologists and cognitive scientists is which psychological mechanism underlies such knowledge and how such a mechanism develops in ontogenetic and evolutionary time.

During the cognitive revolution of the fifties and in the decades that followed, our social cognition has been mainly conceptualized as our ability to attribute beliefs and desires to other people. In the literature this human ability is usually referred to as folk psychology while beliefs and desires are understood and referred to as propositional attitudes. Beliefs and desires are propositional because they always express certain propositions describing possible state of affairs. They are attitudes because they always express our stance toward such propositions, i.e. they express if we believe or do not believe in it or if we desire or do not desire such state of affairs to obtain. The ontological status of propositional attitudes along with the status of folk psychology has been fiercely debated among philosophers

of mind (see e.g. Fodor 1975, Dennett 1987, 1991, Churchland 1990)[11] and I will briefly say something about these debates in the next section.

For philosophers, cognitive scientists, and psychologists concerned with the strategies and mechanisms of our folk psychology, the main question has been what the real nature of this ability is. Is the nature of this ability theoretical, resembling theoretical thinking in the sciences or is it rather similar to modeling (simulation)? As it happened, these two options have become the main two alternatives in the debates on folk psychology.

The other very interesting question related to folk psychology has been about the main purpose of such an ability. In most discussions it has been presupposed that we use this ability to explain and predict other people's behaviour. In evolutionary terms this would make much sense as we are social beings living in groups. It seems very advantageous to be able to know what other people think and feel if the group and individuals are to survive at all. Such an ability allows for better coordination of group action and it results in, for instance, better hunting techniques.

These presuppositions about the nature and the purpose of folk psychology, including the main underlying assumption that folk psychology does consist of the ability to attribute beliefs and desires to other human beings, did shape the discussion regarding the biological basis and ontogenesis of the folk psychological ability. I will come back to developmental issues later in this section but for now suffice it to say that the debates over the kinds of innate and acquired abilities necessary for

11 The point of disagreement in this debate is about the way propositional attitudes 'exist'. According to Fodor propositional attitudes really exist as basic units of the mind's software. For Dennett they are not really out there but we use them for pragmatic reasons, namely to explain other people's behavior. Finally, for Chrurchland they are neural states thus making neuroscience is the future of psychology.

the development of folk psychology has been of central importance for developmental scientists.

The most popular approach to folk psychology, i.e. the one that has dominated the field the longest, has been the Theory-theory approach. This approach did have far reaching implications for biological and developmental theories of our social cognition including the way that the autistic spectrum disorder[12] has been understood and explained. In the next section I will say more about this approach as well as about the implications it had for our understanding of developmental issues. Then, I will turn to the proposed alternative: simulation theory. As we will see in the discussions that follow both approaches resemble our epistemological arguments regarding the knowledge of other minds: namely the hypothesis argument and the argument from analogy. Even though the goals of our epistemological arguments and psychological theories are not the same, they share the same Cartesian assumptions about the human mind and propose very similar psychological mechanisms for reaching out to others from the isolated world of the self.

But, let me begin this debate on psychological mechanisms responsible for social cognition with one psychological experiment. This experiment was meant to determine the period in a child's development when a child becomes able to read other people's minds. It is not surprising that both the Theory-theory approach as well as the Simulation theory approach had their own interpretation of the experimental results.

12 Autistic Spectrum Disorder as a particular developmental disorder of social cognition will be the main topic of the last two chapters.

a) The false belief test

Back in 1983 Wimmer and Perner developed a test that was meant to be a sort of a litmus test for the presence of the theory of mind. This test is now known as the false belief test and is initially designed for children. In the task children are presented with the following story: Maxi places some chocolate in a cupboard in the kitchen and leaves the room. While Maxi is away, another character takes the chocolate from the first cupboard and puts it in the second cupboard, and then leaves. When Maxi returns, the child is asked to predict where Maxi will look for the chocolate. The correct answer, of course, is that Maxi will look for the chocolate were he left it (i.e. in the first cupboard).

The experiment has shown that children of four years and older do understand that Maxi cannot know that the chocolate has been moved to a different drawer while he was out. Younger children do not have this understanding as yet and cannot answer the questions about Maxi's beliefs properly. Instead they tend to apply what they know, i.e. their own beliefs, to Maxi.

It is not surprising that proponents of two major camps, the Theory-theory and Simulation theory, have offered different interpretations of the test results. According to the former, the test shows that children younger than four have not fully developed the theory of mind with the key components of its conceptual repertoire. According to simulation theorists, the failure of younger children is due the lack of the full blown ability to simulate. When we turn to the case of autism in the following chapters we will see that this test is particularly hard for individuals with autism to pass. Proponents of the Theory-

theory approach as well as the simulation theory approach offered their explanation as to why this is the case. But let us now see the specifics of these two approaches so that it can become easier to understand their point of disagreement.

b) Theory-theory

Theory-theory is a position according to which our social understanding is a theory consisting of mental terms that play an important part in a wider theory often called folk psychological theory (Churchland 1992). Churchland describes folk psychology as follows:

> "Each of us understands others, as well as we do, because we share a tacit command of an integrated body of lore concerning the lawlike relations holding among external circumstances, internal states, and overt behaviour. Given its nature and functions, this body of lore may quite aptly be called "folk psychology." (1992, p. 207)

According to Churchland folk psychological theory is an "empirical theory that is subject to the same canons of empirical evaluation as any other" (Davies & Stone, 1995b, p. 7). We do have different kinds of mental concepts that we use in our explanations of other people's behaviour. So, not all of them belong to propositional attitudes. Instead they refer to pains, joys, and immediate feelings. Nonetheless they play a role in our casual explanations of others. We know that Jovan will feel the pain if he burns his arm. We can also predict that he will try to get something that will bring him relief. Complex propositional attitudes (i.e. beliefs and desires) also serve the same purpose. Based on other people's beliefs and desires we are able to make sense of what they do and predict what they are

going to do. All of this suggests that folk psychology has the structure similar to scientific theories.

There are some interesting implications of this position: namely, it seems that folk psychological theory does not presuppose knowledge of one's own mind nor is being human a prerequisite for understanding folk psychology. This is the point that seemed to be overlooked by philosophers concerned with epistemological worries such as Ziff or Price. Instead they both develop their arguments by relying on our self-knowledge and privileged access. For cognitive scientists though this is not the case. Theory-theorists argue that even a creature without a human mind (but with the capacity to make and understand theories) would be able to explain and predict human behaviour should she learn folk psychological theory and its concepts. Furthermore, if this is the case even advanced AI would be eventually able to learn to make sense of human behaviour. All of this fits nicely into the cognitive revolution of the mid 20th century: a revolution that started off, as we have seen, with the computer metaphor for the mind.

Adam Morton (1980) was the first one to introduce the term Theory-theory in order to emphasize that the folk psychology is itself a theory. However, the roots of this belief run deep into history. The tendency of philosophers to explain human action by invoking beliefs and desires goes all the way back to Aristotle. *In Nicomachean* Ethics Aristotle argues that intellect itself does not move anything but it needs either desiderative thought or intellectual desire to be moved. If our actions stem from the tight interaction between what we believe and what we want, it seems natural to unpack both sides if we are to understand why other people do what they do and predict what they are going to do next.

However, strictly speaking, the Theory-theory approach cannot be found in Aristotle or in other philosophers interested in human psychology of the later epochs. Theory-theory

approach is not only about our beliefs and desires and the way they motivate our actions. It is about the very nature of our attributions of beliefs and desires to other people. As we have seen, according to the Theory-theory approach our social understanding comes in the form of a (proto) scientific theory. This, of course, has the roots, not in Aristotle but in the logical positivism of the early 20th century and cognitive revolution of fifties. The former set the criteria for what constitutes a proper scientific explanation and the latter offered a new theory of mind that satisfies such criteria. But, before I elaborate these points let me tell Sellars' story first as I believe it illustrates well the origins of this approach.

Sellars is usually credited to be the first one to develop the idea that the nature of our social understanding is, in a nutshell, theoretical. In his book "Empiricism and the Philosophy of Mind" (1956) he engaged in the now famous anthropological thought experiment. He suggested that we imagine our ancestors as a group of behaviourists who only relied on behaviour on their conspecifics to explain and predict their behaviour. One of them, named Jones, came up with the idea that there might be some inner thoughts and feelings that could lie behind overt speech and overt behaviour. Jones speculated that such feelings and thoughts could also successfully explain and predict other people's behaviour. According to Sellars, whenever we rely on invisible feelings and thoughts as Jones did in his thought experiment, we do engage in a theoretical activity. Moreover, for Sellars, we are engaged in such activity even if we put feelings and thoughts under the general umbrella of reasons for action.

Sellars, as many other cognitive scientists of the fifties and those from the following decades did accept the Cartesian Representational theory of mind. As we have seen in chapter two, according to this view, our minds need to form representations in order to make sense of reality. Within this

framework, making sense of other people's behaviour would consist of representing their representations. This requires a particular stance toward the others. We need to make certain hypotheses about their thoughts and feelings which are not open to our view. They are hidden from us and we need to make a guess as to what is going on inside. While in behaviourism the behaviour was explained through observable stimuli and responses, in the cognitive revolution the black box of inner mental life was opened. As a result mental concepts became explanatory again. Shortly after, along with Sellars, many philosophers and cognitive scientists started to refer to these mental concepts as hypothetical constructs similar to those in the sciences. It was argued that similar to the programmed states of the computer, mental states play an important causal role in what humans do. The Functionalism of that time became the most popular take on the nature of mental states while mental states were defined by the causal role they play. Finally, given that the well accepted metaphor for the mind was the computer, it was widely believed that mentalism of the old kind along with non-physicalism, mysticism, and Cartesian dualism were long gone, while mental states as a constitutive part of our mental life (and important explanatory concepts) were saved.

Some philosophically important changes worth mentioning happened in this transition from behaviourism to early versions of computationalism. The change in the underlying theory of meaning was among them. While logical positivists and most behaviourists subscribed to the referential and compositional theory of meaning, cognitive scientists of the fifties implicitly or explicitly accepted some form of meaning holism of mental concepts. For behaviourists, mental concepts have meaning simply because they refer to something observable. For early cognitive scientists, like Sellars, mental concepts have meaning because they belong to a larger web of principles and play a certain explanatory role in our 'theories' of other people's

behaviour. In this way our mentalistic vocabulary is very similar to other scientific concepts that we use in our scientific theories (Lewis 1972).

This new theory of meaning of mentalistic concepts did make the Theory-theory approach to our social cognition fairly popular among philosophers. It was supposed to overcome the problems of the old fashioned empiricist theory of meaning. Namely, according to the empiricist theory of meaning mental concepts have the meaning either because they refer to observables or because they refer to inner, invisible mental states. Both options turned out to be highly problematic. Behaviourism that relied on the former failed to explain higher cognitive functions while the Cartesian approach presupposed some awkward, scientifically inexplicable inner world that cannot be explained within a physicalist framework.

With the cognitive revolution the suspicion toward mental concepts disappeared. Mental concepts were reintroduced in our scientific understanding of human beings as mind states, being similar to computational states. In a nutshell, holism of meaning secured meaning as an explanatory role in the theory of human behaviour while the inner mental states they invoke were scientifically explicable in the same way the inner states of the computer are.

Among philosophers, Churchland (1993) has been one of the fiercest advocates of meaning holism as he has been interested in arguing that our folk psychological theory is not the best theory there is, but is going to be replaced by a better one, namely the one coming from neuroscience. However, the Theory-theory approach could be accepted without this particular holistic theory of meaning. Fodor's position (1975) would be of this kind. His take is that propositional attitudes do break down into atomistic components which means that they do refer to individual and identifiable mental states. The computer analogy does help here. In the same way we can break down

computer function into a carefully written program, we can break down our mental states into the units of our biological program 'written' in universal language: Mentalese. Mentalese does give the meaning to our mental concepts and is also a part of our biological make-up. In this way Fodor can keep his empiricist, atomistic theory of meaning but can remain physicalist regarding the nature of our mental states.

Now, despite some disagreements about the theories of meaning and the exact nature of mental states, most of the philosophers and cognitive scientists of the time did accept that our knowledge of other people and their inner mental lives does come in the form of a theory. The next question for philosophers was how good this folk psychological theory is. While Fodor argues that it is good and the only one we could have (as it corresponds to the reality of our minds and captures this reality in the best possible way), others, like Dennett, argue that such folk psychological theory is nothing but a heuristic tool for understanding people. Finally, philosophers like Churchland argue that this folk psychological theory is a low grade theory and promise that a better one is on its way. With the development of neuroscience, he argues, we will finally adopt a theory more suitable for our purposes that will have better predictive power when it comes to other people.

What is interesting about the aforementioned debate is that none of its participants questioned that the nature of our folk psychology was theoretical. What they disagreed about was if the theory was good enough or how to understand the ontological status of its basic concepts. So, if we go back to our initial epistemological question (whether our knowledge of other people's minds is justified), we will, on one hand, find Fodor and Dennett arguing that it is and that folk psychology is no worse off than any other science. On the other hand, we will find Churchland arguing that, as it stands now, folk psychology is not a good theory and should be replaced by a better one.

If we accept this premise about the theoretical nature of our folk psychology (and we do not have to as we will see in the following section) the next question for psychologists is how such a theory develops in ontogenetic and evolutionary time. I will turn to some of the answers shortly but before that let me say a few words about the alternative take on the nature of our social cognition. As we can guess, the Theory-theory approach, even though the most popular one, has not been the only game in town. In the next section I turn to the simulation theory. This approach is the most similar to, (if not directly derived from), the argument from analogy and 'psychological mechanisms' usually invoked by it. As such it deserves that we take a closer look at it.

c) Simulation theory

The origins of the simulation theory proposed in the last decades of the 20th century could be found in the 19th century debate over the methods of the social sciences. William Dilthey (1883) and Robin Collingwood (1946) were among scholars who argued that natural and social sciences do rely on different methods and provide different kinds of explanations for the phenomena they investigate. According to Dilthey, in the natural sciences we look for *the explanation* of events while in social sciences we search for *the understanding* of phenomena. The two processes are epistemologically and psychologically different. While natural sciences aim to explain (and predict) why something happens by identifying causes of the event, social sciences aim to make sense of people's behaviour by empathising with them. The results of these two endeavours are different kinds of understanding: one is a deductive-nomological explanation dominant in natural sciences while the other one is an empathic understanding typical for social sciences. In this way methodological autonomy of social sciences has been secured primarily because their subject matter was thought to require a unique method.

However, as we have seen in the previous chapters Dilthey's and Collingwood's ideas about special status of social sciences have been abandoned by logical positivists. Due to the strong influence of the logical positivists in the first half of the 20th century this period was marked by an agreement that there could not be any methodological differences in the sciences. Instead, it was believed that some kind of unification of all

sciences was possible. What this means is that it was believed that theories of higher sciences could be (and eventually would be) translated into the theories of more basic sciences all the way down to physics. As for psychological processes of simulation and empathic understanding it was thought that they could be only used as heuristics in scientific discovery. However, all scientific theories had to have the same kind of structure. All theories needed to yield hypotheses about the causes of events/phenomena and proper empirical justification. In these final stages of scientific research there was no place for empathic understanding.

But, as it happened, the concept of simulation did survive if not in philosophy of science then in psychology. The concept could be found in Piaget's writings (1950) and his idea of role taking and perspective taking. This is very important as we can see that Piaget considered simulation to be the most important skill for social cognition. According to Piaget, by developing such ability children become able to overcome their egocentric perspective.

The revival of the interest in empathy and simulation happened in the last two decades of the 20th century. Even in philosophy of science some did get ready to argue that empathy plays a role in justification of hypothesis because it "gives plausibility" to it (see e.g. Fuller, 1995). Indeed, the departure from logical positivism with respect to many issues happened in the decades following WWII (for the review of some topics see e.g. I. Hacking's book *Representing and Intervening*, 1983). But, the almost forgotten concept of simulation reemerged and became most influential in the theory of mind debate. In a nutshell, according to the simulation theory approach, as opposed to the Theory-theory approach, we do not understand other people by constructing a proto theory about their inner states but rather by putting ourselves in their shoes. This is done by simulation that becomes the most important skill in the

acquisition of mental concepts as well as for the explanation and prediction of other people's behaviour.

One of the main proponents of the simulation theory, Gordon (1996), argues that unlike Theory-theory that invokes inferential processes and reasoning when explaining our folk psychological capacities, simulation theory employs our emotional and motivational resources as the key psychological mechanisms for making sense of other human beings. For this reason he calls the former 'cold methodology' while the latter seems to be using 'hot methodology'.

According to simulation theory, when we make predictions about other people's behaviour we use our own knowledge about the way we behave. In other words, our self-predictions about our own actions are more than reliable in our own case, so there is no reason to assume that the third person statements (predictions about the others) are so much different from self-predictions. As a matter of fact, Gordon argues, that it is highly likely that we use the former to make the latter. According to Gordon, the difference between the first person predictions and the third person predictions is only a matter of degree not of kind. In other words, the underlying psychological mechanism that we use in our own case is far more reliable when it comes to us but we use the same mechanism when it comes to others: the only difference is in the reliability of prediction. That is, we are not that accurate when predicting other people's behaviour while we are fairly accurate when we are predicting our own.

More specifically even in our own cases we often ask ourselves what we would do in hypothetical situations: if we were captured in the war, if we were faced with two appealing job offers and the like. Gordon (1995a) asks whether we use the same methodology when we think about what other people would do. His answer is positive. However, most of us are aware that what we would do in a particular situation is not the same as what somebody else would do so when thinking about

others. So, we do take the differences between us and other people into account. Gordon says:

> "As in the case of hypothetical self-prediction, the methodology essentially involves deciding what to do; but, extended to people of 'minds' different from one's own, this is not the same as deciding what I myself would do. One tries to make adjustments for relevant differences. (p. 63)"

Radical simulation theorists like Gordon argue that the mechanism of simulation itself is sufficient for the acquisition of mental concepts such as beliefs and desires. According to Gordon's view, a child does not need to have the concept of belief to be able to infer how other people feel or what they think. The only thing the child needs is to have beliefs on her own and the mechanism of simulating. By simulating other people's mental states, the child gets the insight into their thoughts and feelings. So, when the child witnesses a fight on the playground in which a friend gets hurt, the child only needs to imagine how she would feel if she is to find out how her friend feels. Through this kind of simulation the child gets to know what mental concepts such as 'belief' and 'desire' mean.

Other simulation theorists argue for a more modest position saying that simulation is a necessary but not sufficient condition for acquisition of intentional concepts (for a review see e.g. Perner and Howes 1992). This means that simulation might give us useful data for what these concepts mean but simulation in itself does not represent understanding of these concepts. For the latter we need other cognitive capacities and normal language development.

Before I move to the questions of ontogenetic and evolutionary origins of social cognition let me just note that it is not hard to see similarities between the epistemological 'argument by analogy' and psychological theories of simulation.

As a matter of fact, these similarities run so deep that many of Gordon's quotes could have easily come from J.S. Mill or Russell. This suggests yet again that epistemological worries and psychological questions do often come together.

d) Ontogenetic and evolutionary origins of social cognition

When developmental questions are asked there are two relevant opposing philosophical traditions that aim to provide the answer: empiricism and rationalism. Both have had various forms, meant different things, and could be traced to the Ancient Greeks. On one hand, the great names of philosophy such as Locke, Hume, and Mill (to name just a few) would be the famous proponents of the former, while on the other hand, philosophers like Plato, Descartes, and Leibniz would belong to the latter. In regard to the origins of our knowledge, the traditional point of disagreement between these two groups was the question of innate ideas. While empiricists argued that our minds are a blank slate when we are born, most rationalists thought that we are born equipped with innate ideas. Both aimed to explain how we gain knowledge of God, mathematics, the world, and ourselves (not necessarily in that order).

Indeed, what was considered to be innate varied dramatically. Historically, innateness has been ascribed not only to innate ideas of, say, God or mathematical objects but also to predispositions, capacities, traits, behaviours, as well as to full-fledged knowledge. Thus, in the history of pathology, we find a view that a particular state of the body (its constitution) predisposes it to acquire certain diseases; this is called the diathesis. Whilst the disease is contracted or developed due to the environment, it is also contracted because of the weak constitution of the body inherited from the parents (Olby 1993). In the weakest forms of nativisim regarding capacities of the mind, as in empiricism and behaviourism, we inherit mechanisms of

learning readiness that do not contribute content to the output of the learning process. What is learned depends entirely on the culture in which the learner grows, but if she is to learn successfully, she must inherit the right predisposition (the learning readiness mechanism).

Mental and physical character traits have also been considered as inherited. One of the first to argue that through empirical research and strict measurement we can determine which traits are due to nature and which are learned, was F. Galton, Charles Darwin's first cousin. Galton believed that nature, at birth, offers a potential for development. Whilst neither nature nor nurture is self-sufficient for development, "no carefulness of nurture can overcome the evil tendencies of an intrinsically bad physique, weak brain or brutal disposition" (Galton 1875, pp. 9–10, italics in the original)[13] .In contemporary evolutionary psychology (see, e.g. Cosmides and Tooby 2000), some instincts and behaviours, such as fear of snakes, incest avoidance, altruistic and mating behaviour and the like, are considered innate. What kind of cognitive mechanism, if any, needs to be innate to generate such behaviours remains to be seen (Cosmides and Tooby 2000).

Stronger versions of nativisim regarding the mind emerged with the cognitive revolution of the 1950s and the subsequent rise of the computer metaphor for the mind. Whilst nativists of the cognitive revolution continued the tradition of seventeenth century rationalists who argued for innate ideas and innate knowledge, later, twentieth century nativists conceptualized innate knowledge as domain-specific learning mechanisms, including the language acquisition device (Chomsky 1959, 1968; Pinker 1994), mind modules for physical reasoning (Spelke and Kinzler 2007; Cosmides and Tooby 2000), the recognition of faces (Cosmides and Tooby 2000) and the like. The main

13 Galton was the father of the statistical twin studies accepted and used by behavioural geneticists.

difference between stronger versions of nativisim that posit domain-specific leaning mechanisms and weaker versions that postulate innate dispositions for learning lies in the fact that the former ascribes some innate content (knowledge) to the process of learning whilst the latter denies such knowledge and postulates elaborate learning mechanisms devoid of content.

Now, if we take a look at the Theory-theory approach to social cognition from the developmental perspective we need to pose a question of how folk psychology *as a science-like theory* is learned. What seems to be clear is that folk psychology is "not learned by way of explicit formal teaching; nor is it written up in text book form" (Davies & Stone, 1995b, p. 12). One way to account for the development of such theory is to follow Churchland (1992) and argue that children learn folk psychology along with their mother tongue. That is, children learn how to interpret other people's behaviour and 'construct' the theory about their inner lives via *implicit* learning of language. This means that, for Churchland, there is no need to postulate an innate theory of mind to account for the development of folk psychology. Instead, the development of our folk psychology is accounted for by language acquisition.

However, in the nature/nurture debate regarding theory of mind, Churchland's position has not been the most popular. Carruthers (1996) argues, for instance, that folk psychological theory needs to be innate and inherited from our ancestors.[14] He provides several arguments to support the strong nativist take on the issue. Firstly, he says that all children (except those with impairments) seem to acquire folk psychological theory at the same rate by going through the same developmental steps. If this theory is indeed a theory and if children do behave like

14 Carruthers is not the only one. The most famous proponent of the thesis that the theory of mind module is innate is Baron-Cohen (1995). But, since he derives his position from his research on autism I will come back to it in the next chapter.

little scientists it would be almost inexplicable within an empiricist framework of how and why they arrive at the same theory at the same time (around the age of four), unless, of course, such theory is innately given to them.

Secondly, if the theory is not explicitly taught, how do children learn it after all? This is the version of Chomsky's well known poverty of stimulus argument according to which children need to have an innate language acquisition device because their parents do not correct them explicitly when they make grammatical mistakes. Such explicit corrections would be necessary if children are to learn language only by induction. The same points apply to the theory of mind acquisition. Children seem to be learning it effortlessly. Parents need not teach them explicitly about other people's inner lives. Moreover, the theory of mind seems to be invariant in all cultures across different historical periods and in this way appears to be universal. This would be also inexplicable if the theory of mind was learned and dependant on particular cultures. From here Caurruthers concludes that the theory of mind and our ability to folk psychologize needs to be part of our biological make up. This, of course, also means that such a module has been selected in human evolution. Or to put it in Sellars' terms, all these Jones who were able to mindread had the advantage in the race for survival over those who couldn't. Accordingly, their genes were saved and passed on to the next generations.

If we go back to the structure of the false belief task we can see why the Theory-theory approach had its appeal for developmental psychologists. Given that the test is designed to tell us what kind of beliefs about other people's beliefs a child has, it somehow seems uncontroversial that the test aims to uncover the details of the child's developing theory of mind. In other words, some developmental psychologists took for granted that our social knowledge is theoretical and that their duty is to tell us how such a theory develops.

As we have seen, unlike theory-theorists, simulation theorists take it that the very nature of our social cognition is not theoretical. Accordingly, for simulation theorists, the developmental stages of children's social cognition do not consist of theory construction but of advancement of a child's ability to simulate. Along these lines Harris (1992) argues that the inbuilt, innate mechanism for joint attention and joint emotional stance is crucial for the first developmental steps toward full blown ability to simulate. Without such a mechanism a child ends up on the autistic spectrum. I will discuss the case of autism in the next chapter but for now let us keep in mind that both theory-theorists as well as simulation theorists accept the nature/nurture dichotomy even though they disagree about the exact nature of the innate mechanism.

So, where do the origins of simulation and advanced folk psychology lie? Harris tells us they are to be found in joint attention and joint emotional stance. But, when exactly do these abilities emerge? Developmental psychologists tell us that around nine months of age infants begin to understand other people as intentional beings. At this time a child begins to use and understand the gesture of pointing and starts engaging in the so called join attentional scenes. Participation in such scenes means that the child is able to understand that the other person wants her to attend to a particular object or event. This is the period that Tomasello (1999) calls the nine-month-revolution in a child's social understanding. Or, as Harris put it, at this time and during the second year of life, children begin interpreting other people's behaviour as intentional and develop a practice to act on it (by trying to draw a caregiver's attention). What comes later is the refinement of this interpretative strategy.

By the time they are four, their interpretative strategy is such that they can imagine a situation in which another person holds a belief toward the situation that runs counter the belief

that the child has. However, this ability does not come from the advanced theory but the refined and sophisticated ability to imagine oneself in the situation of the other. Our conceptual apparatus as well as our practice to explain and predict other people's behaviour in a theory-like manner emerge from the child's ability to simulate. Or to put it differently, this is exactly where our language comes from while the proto-scientific manner of explaining and predicting comes along with it.

For Tomasello as well as for Harris our basic ability to simulate other people (i.e. our ability to understand others as the self or to participate in joint attentional scenes) is part of our biological make-up and has been selected in our evolution. In this way simulation theorists do accept a nativist explanation of social cognition, but unlike theory theorists, they argue that a simpler mechanism of simulation is innate rather than a full-fledged knowledge, mental concepts, or a theory construction module. So, disagreement between the two camps revolves around questions of whether a more basic mechanism such as simulation is rich enough to account for the emergence of language and advanced folk psychologizing. While theory-theorists think that it is not, simulation theorists hold that it is.

In the next chapters we will see that these issues are not only of theoretical importance but have profound implications for our accounts, diagnostic criteria, and clinical intervention of developmental disorders such as autism. But before that, let us summarize what we have learned so far and see if there are some alternatives to the Theory-theory and simulation theory approach to social cognition.

e) Going beyond the theory-theory and simulation theory approach

Despite the differences regarding the nature of the psychological mechanism underpinning our social cognition, the Theory-theory approach as well as the simulation theory approach do share the view of the very nature of social cognition. Firstly, both approaches presuppose that social understanding consists (at least in its advanced stage) mainly in attributing propositional attitudes to other people in the third person. Secondly, both assume that the main purpose of social cognition is prediction and explanation of other people's behaviour. When explaining the development of social cognition the Theory-theory approach, as well as the simulation theory approach presuppose the Cartesian view of mind. According to it, the child's mind is locked within itself and needs to make representations of the world and the others if she is to understand the world and survive in it. For the child to be able to build such representations she needs to be equipped with some sort of innate mechanisms. As we have seen in the previous sections, different innate mechanisms of social cognition have been proposed from the simple to more sophisticated ones including elaborate innate knowledge. Of course the interesting question is: are these Cartesian presuppositions really the ones we need to accept?

In the last several decades some cognitive scientists, psychologists, and philosophers began to develop and take seriously various critiques of the Cartesian theories of mind. Critiques have come from different philosophical trends as well as various disciplines. What they all have in common though

is the attempt to undermine some of the key presuppositions of Cartesianism. Thus, some of them attack the representational theory of mind that is characteristic of the Cartesian approaches. Or, to put it differently, they question the very idea that we get to know what other people think and feel via representations and inference. Others aim to undermine the cognitive bias of Catertesiansim by arguing that we get to know and understand others not through cognitive mechanisms but via affective ones. To be fair, simulation theorists made a step in this direction but it was not radical enough. As we have seen, in all the important ways they remained Cartesian despite some modifications. Furthermore, there are other critics who aim to undermine the Cartesian presupposition that we are isolated minds. Some of them use phenomenology as the starting point while some search for the empirical evidence coming from developmental psychology, social psychology or even primatology to support their non-Cartesian theses. Even though the goal of this book is not to cover all of the critiques of Cartesianism let me just briefly illustrate some of them so that we can get a sense for the variety of alternatives that are out there.

Philosophers such as Zahavi (2007), Thompson (2007), and Gallagher (2007) have argued that somewhat forgotten phenomenology could be a good starting point for developing an alternative view of the nature of mind. They argue that the works of Husserl, Scheler, and Merleau-Ponty offer insights about the nature of our interpersonal relations that could be of great help in our understanding of social cognition and its development. One of the main presuppositions that both Theory-theory and some versions of simulation theory accept is about the way we arguably detect other people's mental states. They both assume that what we perceive is mere behaviour of other people while we conclude via inference that they have mental states. However, what phenomenologists tell us is that 'mere behaviour' is not something that we perceive or experience

when interacting with others. Zahavi argues that perception of expression is perception of experience. He continues by saying that we cannot detangle the two except when we abstract from real experience. This means that the connection between expression and inner experience is much closer than theory-theorists and simulation theorists presuppose. Similarly, Gallagher argues that we perceive meanings of gestures, expressions and actions directly in the interaction with others while theoretical approach and simulation are rare strategies that we only sometimes use.

Other phenomenologically oriented philosophers, like Stawarska (2007), have addressed the so called *egological* tradition of both folk psychological theories as well as phenomenology. She argues that the 'I' or the "self' are never isolated in the Cartesian way. So, the first step we need to make if we are to go beyond current folk psychological theories is to adopt the view that the 'I' or 'ego' emerge in the interaction with others and exist only in this relation. In other words, there is no 'I' that needs to bridge the gap between herself and the rest of the world in order to reach other people. This isolated Cartesian 'I' is nothing but a theoretical construction that has little to do with the way we experience and understand the world. Furthermore, she argues that there is an important difference between the I/you relation and I/he/she/it relation. When we are in a dialogue with someone, when we interact with them directly we make sense of their thoughts and feelings directly. We take what Stawarska calls a personal stance toward them. However, when we talk in the third person about somebody who is absent (or even present but we do not address them directly) we remove such a personal stance. These are the subtleties of the human interaction that folk psychology does not take into account. Given this grave oversight, it seems unlikely that folk psychological theories could identify underlying psychological mechanisms of our social cognition.

Similar insights to those coming from phenomenology could be found in developmental psychology. Hobson (2007), for instance, argues that we do not understand others as bodies plus minds. Our understanding is always understanding of whole persons. This kind of social understanding has been constituted through affective responsiveness during the first years of life. He holds that affective interactions between a child and a caregiver are formative for our social understanding. Hobson's position represents a sharp break up with overly cognitive approaches of Theory-theory and simulation theory. According to Hobson we are born with the capacity to resonate with others. Thus, we do not really infer how they feel but we perceive in their expressions how they feel. This emotional connectedness that we have with others is not reached via simulation as our minds are not isolated Cartesian subjects. It is rather the case that our minds do emerge as minds through such interaction.

All of the aforementioned critiques aimed to undermine two main Cartesian assumptions about mind: a) that there is an isolated 'I' that needs to form representations of the outside world in order to make sense of it and b) that there is a sharp categorical distinction between inner mental states and outer expressions of these states such that we need to infer what the other person feels and thinks based on her behaviour. In a nutshell the critique has been that the 'I' is never isolated but is being constituted through the interaction with others while the connection between an inner life and outer expression of it is much closer so that we directly perceive what others think and feel in their behaviour.

Besides attacking these Cartesian assumptions about the mind we could also attack the folk psychological assumption that the main purpose of folk psychology is to explain and predict other people's behaviour. Furthermore, we could also attack the one that usually goes with it, namely the claim that we do the explaining and predicting by attributing beliefs and

desires to other people. Goldie (2007) criticizes the latter and cites many cases in which beliefs and desires play virtually no role in our explanations of other people's actions. When explaining why people do what they do we very often rely on their personality and character traits, their emotions and moods (like depression or drunkenness), the way they were brought up (and other narrative/historical factors that contributed to the formation of their character) and the like. Belief/desire psychology is only one small segment of our every day psychologizing which philosophers and cognitive scientists have overemphasized.

Unlike Goldie, Hutto (2007), McGeer (2007), and Kusch (2007) attack the view that our folk psychological practices mainly serve for prediction and explanation of other people's behaviour. For Hutto our understanding of other people is formed through narrative practice which cannot be reduced to explanation and prediction of other people's behaviour. Nonetheless our ability to engage in explanation and prediction is enabled by such practice. Children come to understand others through stories. Through these stories they get to know the reasons why people do various things. Such narratives are the background and the foundation of our social cognition. Similarly McGeer argues that our social cognition does not involve detached theoretical thinking as Theory-theory and simulation theory presuppose. Social cognition is rather some kind of social glue that allows for the variety of social actions where we learn how to make ourselves understandable to others as well as learn how to understand them. Its main function is regulative and is learned through the reciprocal interaction between a child and a caregiver in the early days of life where the goal is to achieve shared understanding. Along the same lines, Knobe (2007) argues that our folk psychology has yet another function that has been overlooked in the Theory-theory and simulation theory: namely it plays a crucial role in the formation of moral judgments. Moral concepts in fact are such that they cannot be

easily detangled from folk psychological concepts. They are a constitutive part of concepts such as intentions, reasons, and values. In sum, beside explanation and prediction, folk psychology also "supplies shared norms of conduct that contribute to interpersonal understanding, interaction and coordination. These norms need not be understood as contents of individual brains, to be interpreted by other individual brains. Instead, they might well take the form of a social institution, through which we interpret and experience ourselves and others."(Ratlcliffe and Hutto 2007, p.16)

Finally, there are critiques that attack the very notion of folk psychology. It seems that folk psychology involves so many different abilities and activities that it does not make much sense to expect to provide a unified account for all of them (Morton, 2007). Others argue that the studies of other species indicate that folk psychology differs from species to species and that we will lose the subtleties of other creatures' folk psychologies if we try to interpret what they do within the belief/desire framework (Andrews, 2007). Other philosophers aim to undermine wide spread belief that belief/desire folk psychology is commonsensical. Ratcliffe (2007) actually did empirical research and found out that belief/desire folk psychology is far from being commonsensical but rather a philosophical construction or abstraction from what regular folks do when engaging in social interaction. Along with Morton he concludes that this way of interpreting our social cognition has no psychological reality.

As I already announced, to cover and evaluate all of the aforementioned approaches is not the goal of this book. Instead, in the last chapter, I focus on one essentially Wittgensteinian approach to other minds that Hyslop (1995) calls the attitudinal Wittgensteinian approach. We will see shortly that this approach does overlap with many alternatives to the Cartesianism mentioned so far. How successful this particu-

lar alternative is will be examined from the perspective of one particular case: the case of autism. Here my goal will be two-fold: firstly, I want to examine how well the case of autism provides support for this particular approach; secondly, I aim to explore whether and how this approach can help us understand autism better. But, before I turn to these issues there is one more thing that needs to be done. It is not surprising that both the Theory-theory approach as well as the simulation theory approach have extensively dealt with the case of autism. Both camps have used it as empirical evidence for their positions. Both camps have also aimed to explain the deficit. So, in the next chapter I will deal with their take on autism first.

Chapter 3
The case of autism

In the last couple of decades Autistic Spectrum Disorder has been receiving a great deal of attention. Since autism as a hot topic became more present in parenting magazines and on television shows, even those who know little about child development are now somewhat familiar with the disorder. Most parents now know that autism is diagnosed in the first years of child's life and that it affects the way a child communicates and relates to other people. However, this is a fairly recent phenomenon. Autism as a separate developmental disorder has not been even acknowledged until mid 20th century. The first to identify it was Leo Kanner in his now famous 1943 paper "Autistic disturbances of affective contact". While previously children with autism were thought to be idiotic or schizoid, Kanner made the case that 'infantile autism' was a syndrome different from others. A year later, Hans Asperger separated 'autistic psychopathy' from other similar disorders.

In the following decades many studies on autism, its causes, diagnosis and treatment have been done. The next milestone that has changed the way autism has been understood was Lorna Wing and Judith Gould's epidemiological study (1979). Wing and Gould concluded that autism is a spectrum of disorders rather than one unique disorder. What this means is that autism has different manifestations and that individuals affected by it

could experience problems in different social, affective, and cognitive areas to a different degree. Wing and Gould proposed that we should treat this disorder as Autistic Spectrum Disorders where ASD is the umbrella term covering both Kanner's infantile autism as well as Asperger's autistic psychopathy even though they differ dramatically in the way they are manifested in affected individuals. In other words, some individuals on the spectrum are severely affected to the extent that they do not learn language and remain non-verbal for their entire life while others only experience subtle problems in communication with other people.

Currently, the criteria for defining and diagnosing autism are closely tied to behavioural problems in three important areas of human functioning: social interaction, social communication, and imagination. These three are known as the triad of impairments (Wing, 1992). What this basically means is that children with autism mostly have trouble reading other people's minds: they have trouble inferring how other people feel and what they think and usually do not know how to communicate their needs to others. Also, they do not get social cues and have hard times learning what socially acceptable behaviour in a particular situation is. These social impairments are often accompanied with the delay in pretend play, role play, and language development. However, even when children with ASD do develop language sufficiently, the way they use language is rigid, literal and lacks pragmatic function. Their ability for imaginative and abstract reasoning remains limited throughout their life.

Given the nature of ASD both the Theory-theory approach and the simulation theory approach to our social cognition have been proposed to account for it. They are not the only ones though. Theories of autism that focus on particular cognitive deficits have been also developed even though they never gained popularity as those relying on social cognition. Unfortunately none of them offered a more inclusive approach to

ASD. On one hand, most prominent theories of autism, those that directly address the impaired social cognition have been reductive. As we will see shortly the extensive theory of mind literature accounts for autism mostly by postulating an impaired innate theory of mind module, while simulation theorists argue that children with autism do not have nor can they develop basic skills to simulate other people's mental states. These approaches have little if anything to say about non-essential characteristics of autism (such as atypical sensory perception, problems with stimuli integration and the like). On the other hand, there are several theories of autism such as Frith's weak central coherence hypothesis and Plaisted's enhanced perceptual processing hypothesis that invoke the impairment in the basic processing abilities of children with autism as the main culprit in the derailment of their language development. The problem with these theories is in their fairly simplistic account of the relation between perception, cognition and language while their explanation of the impaired social cognition of children with ASD is not spelled out and remains vague.

My goal in this chapter is to take a closer look at these accounts and see what kind shortcomings they face. But, before I do that let me unpack in more details the aforementioned triad of impairments characteristic of the autistic spectrum as we need to know what exactly these theories of autism aim to explain.

1. Triad of impairments: a closer look

According to Wing (1996) there are several ways in which children with autism may experience and exhibit problems in social interaction. Based on the particular pattern of their impairment she identified four groups of children. 'Aloof' children do not initiate nor respond well to social interaction. They do particularly badly with their peers while they might enjoy some physical contact. The 'passive' group could be engaged in social interaction. They potentially could enjoy it. However, this is not sufficient to prompt them to initiate such interaction on their own. There is an active but odd group of children too. They like to start conversations but they lack the ability to tune in and read the cues from others well. Their conversation starters are usually awkward and unconventional and they do not pay attention to the way other people react to them. So, this kind of social interaction would be best described as one way interaction. Finally, there is the stilted group. Children in this group could initiate and sustain conversation. However, they are formal and rigid in such interaction. These groups show a variety of the impairments in social interaction and illustrate well how wide the autistic spectrum is. However, it does not mean that the individuals are destined to stay in one group. As they grow up they can move from one group to another.

Further analysis of the way individuals with ASD use language can help us understand better their general problem in relating to and interacting with other people. As already mentioned they have trouble listening to others. So, even when they do have language skills they often use it to talk 'at' others not

with them. Also, even when they have mastered the language they seem not to understand that people use language to talk (among other things) about their inner feelings and thoughts. Autistic individuals could learn to use language to ask for their immediate needs but they do not seem to feel the need to go beyond that in the communication with other people. Furthermore, they are not good in non verbal communication and do not use gestures, facial expression, body postures, and intonations to pass on how they feel and what they think, nor are they able read non verbal cues in others.

Like the problems in social interaction, the problems in verbal and nonverbal communication vary dramatically in individuals with ASD. Some of them remain non verbal their whole life while others could develop language, acquire extensive vocabulary and could eloquently talk about subjects of their interest. Nonetheless the language they use is often atypical in some ways. Sometimes individuals with ASD are echolalic and tend to repeat words of others either immediately or with a delay. They have trouble with pronouns (I/you) and demonstratives (this/that, here/there) and often reverse their proper use. They use and understand language literally and do not pay attention to what the speaker intended to communicate but to the meaning of the words. The language they use is often idiosyncratic, i.e. it has a meaning different from the one accepted by the group of speakers. They also use neologisms: words that have meaning only for them. They also exhibit repetitive questioning, the use of the same verbal scenario that requires the same reaction from others. Their speech is usually formal in both grammar and vocabulary while they talk in a flat voice having idiosyncratic intonation, rhythm and stress.

These general features of language that individuals with autism use bring us to the last set of impairments in ASD, i.e. the impairments in imagination. Children with autism do not engage in pretend play or other kinds of imaginative play with

adults or peers. Even when they do such pretend play is copied from TV shows or other people and is executed rigidly without improvisation. They have hard times understanding literature, subtle humor, and irony and tend to focus on minor details in the environment not on the meaning of the whole scene.

All of the above impairments usually go with a variety of repetitive stereotyped activities from flicking fingers and objects, rocking and head banging to arranging objects in lines and patters, following the same routs and asking the same questions a number of times. All these characteristics (the Triad plus repetitive stereotyped activities) are considered to be primary, i.e. essential for diagnosis. In addition to these there is a number of non essential characteristics of ASD. Individuals with ASD usually also have unusual sleeping and eating patterns, problems with motor imitation and motor control, the lack of eye contact, unusual responses to sensory stimuli, inappropriate emotional reactions and sometimes they do have special skills in some areas while they are lagging behind in some other areas.

Now that we are aware of the variety of the impairments characteristic of the autistic spectrum let us see what kind of explanations of such impairments the Theory-theory approach and the Simulation theory approach offer. They are both accounts that focus on the impaired social cognition while explaining away other behavioural problems of individuals with autism as the unfortunate side effect of this primary core deficit.

2. Autism within the Theory-theory and Simulation Theory approaches

The first to champion the Theory-theory approach to autism was Simon Baron-Cohen in his now famous book “Mindblindness” (1995). As the triad of impairments suggests the central feature of autism is the inability of the individuals diagnosed with it to infer another person’s mental states. In some cases it is not even clear that a person with autism understands what the concept of mind means. Baron Cohen argues that this impairment is the result of the deficient theory of mind module which autistic individuals fail to develop while the lack of it he calls mind-blindness.

As we have seen in the previous chapter Wimmer and Perner (1983) in their classic experimental study have established that in normal children the capacity to attribute beliefs and desires to other people becomes apparent at approximately the age of four. Two years later Baron-Cohen, Leslie, and Frith (1985) performed a similar study but included normally developing children, children with Down syndrome and children on the ASD spectrum. Their results were striking. They reported that unlike normally developing children and children with Down syndrome children with autism fail the theory of mind test. These results have been repeated in the follow up studies (see e.g. Frith, 1989). In order to avoid some objections that the results could be explained by language impairments of individuals on the spectrum, researchers have developed a non verbal test in which they asked children to order a picture story in a way that it makes sense (Baron-Cohen, Leslie, &

Frith, 1986). Again the results were striking. When the picture story was about some kind of mechanistic causality, the performance of children with autism did not lag behind normal children and those with Down syndrome. However, when the story was about other people and their beliefs, children with autism performed considerably worse than other groups of children. Moreover, their performance was no better than chance.

As the interest in children with autism was on the rise, other similar studies have been done. So, Happe (1997) found that even when they manage to pass the false belief test they seem to be using different strategies to come to the right conclusion than their normally developing counterparts. What this means is that when asked how they solved the test, children with autism provide a detailed justification for their conclusion as well as the steps they undertook to solve the problem. Non-autistic individuals, on the other hand, are not able to do this. Thus, autistic individuals seem to be relying heavily on logic to figure out the proper answer while normally developing children and adults seem to be solving the test spontaneously. Indeed, what these results exactly mean needs to be explained further. Finally, unlike normally developing children and adults, individuals with autism fail more complex theory of mind tests (even when they pass the simpler ones) and fail to apply what they have learned in experimental setting to real life situations (Happe 1995). Now, the question why is this case. What might be the cause of such specific impairment in autism?

Baron-Cohen's answer is shaped by evolutionary psychology. According to him there is an innate theory of mind module. Such a module is a special cognitive device with distinct neural realisation. In other words, the theory of mind module is a specialised microcomputer dedicated to solving problems in the area of social cognition. However, it is important to notice that the theory of mind module is not solely a mechanism or a tool for understanding other minds. That is, the inherited theo-

ry of mind module contains a significant body of innate knowledge. In this way Baron-Cohen is the advocate of strong nativism fairly similar to the one that Chomsky proposed when he argued for the innate language acquisition device (LAD) back in the early days of the cognitive revolution. Now, for Baron Cohen the innate theory of mind module consists of an implicit theory of the way the human mind functions. All normally developing children and adults are able to use this implicit theory when they infer what other people think and feel, i.e. when they want to explain or predict the behaviour of others.

As for the development of the theory of mind module there is a possibility that this module is composed of several subsystems. It might be also the case that these subsystems develop in various stages. For instance, these stages might involve simple desire psychology; perception-desire psychology; belief-desire psychology (see e.g. Wellman, 1990). The development of subsystems through different stages could explain this lengthy period of time of four years that it takes children to develop a full blown theory of mind and reach the final stage of the theory of mind module development. However, regardless of the number of subsystems proposed or developmental stages identified Baron-Cohen and all others who endorse the theory of mind module do accept that the theory of mind is innate and therefore evolutionary selected (i.e. that it is a part of our biological make up) and that it consists of a theory of what mind is and what the mind does.

Indeed, this is a version of the Theory-theory approach to other minds as defended by many philosophers and cognitive scientists (e.g. Churchland, 1990; Fodor, 1975; Wellman, 1990; and others). According to this approach the causes of autism lie in the damaged specialised theory of mind module. Due to this damage children as well as adults with autism fail the theory of mind test. Even when they learn to pass it, the cognitive mechanisms they use seem to be different from the ones that

normally developing children use. Finally, since the theory of mind module is a specialized module in the case of impairment it does not necessarily affect other areas of cognition. So, children with autism could show good performance on other cognitive tests, those that are related to what is sometimes called 'folk physics'. As we have seen, research has confirmed that children with autism do average on causal reasoning tests that do not involve social agents (Baron-Cohen, Leslie, & Frith, 1986).

Aside from Baron-Cohen's proposal there are other versions of the Theory-theory approach explaining autism. These proposals do not endorse a fully modular, genetically determined, and evolutionary selected theory of mind and instead propose that children are rather like small scientists who, through experience and some basic innate mechanism, work on building the theory of mind. So, within these approaches the mind-blindness of autistic subjects is treated as a *consequence of* some more basic innate deficit even though the nature of the theory of mind, i.e. our social cognition, is understood in the same way as in Baron-Cohen's version, namely as theoretical in its nature. (see e.g. Melzoff and Gopnik, 1993, Wellman, 1990).

However, the experimental results often cited by Theory-theorists do not support their approach in such a straightforward manner as they seem to think. It is not surprising that the proponents of the simulation theory have interpreted the same experimental results somewhat differently. So, let us briefly take a look at some of the issues that are at stake.

According to simulation theorists (see e.g. Gordon 1995; 1996), the main problem that Theory-theorists face is the discrepancy between an ability of children with autism to construct good theories in many areas of cognition and the lack of such ability when it comes to social cognition. Furthermore, a similar inexplicable inconsistency seems to be present in

children with Down syndrome too. These children seem to be poor theory builders in all other areas of cognition except in social cognition where their theory construction ability is not impaired. In a nutshell, a good theory construction in children with autism is at odds with their poor mindreading and social skills provided that those skills are theory based as Theory-theorists argue.

If we follow simulation theorists and reject the assumption that the nature of social cognition is theoretical we might find ourselves in a better position to overcome this discrepancy. According to simulation theorists, we should look beyond the theory of mind tests into the triad of autistic impairments to get a better sense for what might lie beneath the failure of individuals with autism to pass these tests. As we have seen, one of the core impairments of autism is related to imagination. Children with autism do not engage in pretend play or role play as normal children and children with Down syndrome do. It has been shown that under certain conditions they could be prompted to do so (Lewis & Boucher 1988; Ungerer & Sigman 1981). However, their pretend play is still marked by inflexibility and repetitive patterns and lacks the spontaneity characteristic of pretend play of normally developing children. What is really missing from the way autistic children play is the role play and joint role play in which several children participate.

For simulation theorists this lack of the specific other-regarding pretense might seriously impair the ability of autistic children to ascribe beliefs and desires to other people. This might be the major cause of their inability to make sense of other people's behaviour which then results in their inability to pass the theory of mind test successfully. Simulating other people's mental states is crucial for pretend play and vice verse. In other words, when we want to predict what our friend is going to do next we imagine (pretend, simulate) their situation (and adjust for crucial differences between us and them) and then

infer what their next move might be. This ability to pretend that we are others, i.e. to simulate others, underlies our ability to explain their behaviour in terms of beliefs and desires and probably the vary acquisition and the understanding of concepts such as 'belief' and 'desire'.

Despite criticisms that are coming from the camp of simulation theorists, there is a way for Theory-theorists to strengthen their position. Carruthers (1996) has pointed out that children and individuals with autism do not only have an impaired ability to ascribe beliefs and desires to others but also lack the ability to ascribe beliefs and desires to themselves. This means that their mind-blindness goes hand in hand with their lack of self knowledge. Baron-Cohen (1989) found that autistic subjects find it difficult to remember their own recent false beliefs as well as to attribute false beliefs to other people. They also seem to have trouble drawing the appearance-reality distinctions. If they do not have the concept of belief and desire, i.e. if they do not understand that it is one thing to believe that something is the case and yet another that something is actually the case, they would certainly have difficulty understanding the difference between their experience and what that experience is of. Similarly, Hurlbert *et al* (1994) found that individuals with Asperger's syndrome found it hard to report their inner experiences. Those who could pass second order false belief tests did not report any inner verbalisation, unsymbolised thinking or emotional feelings. They only reported visual images. The one who could not pass advanced false belief tests did not report any inner experiences at all.

Now, these findings have interesting implications for the Theory-theory approach and the simulation theory approach. If we accept Theory-theory we could argue that our self-knowledge is also theoretical, i.e. that it requires certain mental concepts. Without such mental concepts we would not be able to make sense of our own inner life. We would not be able to

identify and individuate our feelings nor our thoughts. As a result we would not be able to communicate them in any way, let alone to talk about them. For Theory-theorists (at least for those authors such as Baron-Cohen and Carruthers) individuals with autism do not have such concepts because they do not have the innate theory of mind module that got impaired due to some genetic malfunction. Accordingly, these individuals cannot have, nor can they develop, either self-knowledge or knowledge of others.

Simulation theorists are not in a position to make a similar move. For them, self-knowledge needs to precede knowledge of others. This is primarily because simulation cannot be done in a vacuum, i.e. if we are to simulate others we need to have a model that we will use. This model happens to be our own mind. So, in developmental terms children need to reach some sort of self-understanding first. Once they gain such understanding they can use simulation to obtain knowledge about other people's thoughts and feelings.

It is interesting to see how in this case the simulation theory approach belongs to the classical Cartesian paradigm whereas the Theory-theory approach escapes it, at least in the matter of the first person/third person asymmetry. According to simulation theory it is possible to have autistic individuals with intact self-understanding but with an impaired simulation skill necessary for understanding of others. However, if an individual lacks self-understanding, simulation theory could not explain such impairment by invoking simulation simply because simulation is not the mechanism for obtaining self-knowledge. Theoretically speaking then, individuals with autism could have the simulation skill intact, but due to their impaired self knowledge they would not be able to use it. From here it follows that, given the empirical evidence of the lack of self knowledge in individuals with autism, simulation theory is not particularly good as an explanation of the ASD.

Carruthers develops the Theory-theory approach further by offering an explanation for the lack of imagination and pretending in children with autism. He argues that at first glance it seems puzzling why individuals with autism would have problems with these abilities. That is, it is not obvious why the impairment of the theory of mind module would necessarily affect imagination particularly when inanimate objects are involved. So, the question is if the Theory-theory offers the correct explanation of ASD, then why is it that children with autism cannot engage in pretend play (i.e. why they cannot pretend for instance that a banana is a phone) as normally developing children do. It seems that this kind of play does not require the mental concepts and psychologizing that are necessary for pretend play involving the pretence of being somebody else or for false belief tests. Now, Theory-theorists could leave this unexplained but that would cause some damage to the position even though it would not be devastating.

To fix this, Carruthers argues that children with autism could indeed engage in such pretend play (no impairment prevents them). However, due to their impaired theory of mind module and problems in social communication they are not motivated to do so. In other words, pretend play of this kind is enjoyable for normally developing children because through such play they get "the sense of being able to manipulate one's own mental representations in imagination; which then requires, of course, that one should have ready access to the states containing those representations... just as you cannot enjoy running or jumping without being conscious of (or being aware that you are) running and jumping, so, too, I suggest, you cannot enjoy supposing or imagining without being conscious of your (mental) activity." (Carruthers, 1996, p. 272)

However, both Theory-theory proponents as well as simulation theorists have focused on the core impairments of autism. Both camps have tried to explain the impairment in social

cognition from within the core impairments either by postulating the lack of a theory of mind or a simulation skill as the main culprit for onset of ASD. However, what mostly remains unexplained within these approaches are the non-core deficits in ASD. Admittedly, Carruthers proposes the way to connect core and non-core deficits too. He argues that the lack of the theory of mind in these individuals could explain their tendency to engage in repetitive activity, their focus on order and ritual, very narrow interests, and rigid and literal language. If these individuals lack mental concepts and the theory of mind, he argues, they will not be able to negotiate social interactions that could be overwhelming to a person who does not know how to act and what behaviour other people expect. As a result, autistic individuals might isolate themselves even further. It is not surprising then that they might impose on their world some arbitrary rules and ritualize their activity in order to gain more control over the world that as such must look utterly unpredictable and scary to them.

But, as we will see shortly there is another way to relate the non-core and core deficits in autism. Many recent findings in intersensory perception and sensory integration suggest that these non-core deficits lie at the heart of the disorder leading to the derailment in higher cognitive, linguistic, and social functions. Before I turn to this alternative and more integrative explanation of autism let me say a few words about several other accounts that start off with cognitive instead of social deficits in their take on autism. In addition to the impairment in social cognition, individuals with autism also suffer from inflexibility in thought and abstract reasoning. These impairments are hard to explain as a by-product of the impaired theory of mind module. So, Leslie and Roth (1993) and Baron-Cohen and Ring (1994) accept that in addition to the impaired theory of mind module autistic individuals might have impaired centres for executive functioning. Despite difficulties, Carruthers

argues that our executive functioning, such as problem solving and planning, strongly depends on our ability to access and evaluate our own beliefs and desires. According to Carruthers this very ability is impaired in individuals in autism exactly because they do not have the theory of mind module. Along these lines he says:

> According to the modular hypothesis being defended here, the capacity for these sorts of swift and reliable forms of meta-access to our own beliefs, desires, and sequences of thinking and reasoning will be mediated, in the normal case, by the operation of the theory-of-mind module. It is therefore to be predicted that someone who is mind-blind, or whose theory-of-mind module is damaged, will experience considerable difficulty in tasks which involve the more complex (second-order) forms of practical reasoning. (272).

However, not all alternatives are exhausted by these two. There is a group of psychologists who opt for a different solution. Instead of the deficit in social cognition they place the cognitive deficit in the centre of ASD. This has not been the most obvious route for most as there is a wide spread belief that children with autism have their other cognitive capacities intact. Even some empirical findings on causal reasoning that we have seen so far seem to be supporting this conclusion. But, there are quite a few studies that show that the impairment in abstract reasoning in these children is profound. I am turning to the theories that focus on these impairments now.

3. Cognitive deficiencies: the theory of weak central coherence and the enhanced perceptual processing hypotheses

Frith (1970) and Happe (1996) were the first to focus on non-social deficiencies of children with autism. Contrary to popular belief, these children do have such deficits mostly in the area of abstract reasoning. They include atypical learning strategies in the acquisition of concepts and categorization and the inability to generalize. It has been found that children with autism have the tendency to rely on rules instead of prototypes when learning new concepts (Klinger & Dawson 2001), and that they exhibit a general tendency to behave in a strictly rule-bound way (Boucher 1977; Frith 1972). Also, children with autism perform well on the sorting tests in which they are asked to sort items according to the rule or attribute inherent in the test materials themselves. However, they perform poorly and exhibit considerable inflexibility on the free sorting tests in which they are asked to come up with a different criteria to group the same set of objects (Minshew, Meyer, & Goldstein 2002). Finally, children with autism seem to be poor in transferring what they have learned in one situation to another situation. It has been found that in perceptual learning tasks, children with autism can learn a specific pattern of dots, but cannot generalize to another set of dots presented in a slightly different way (Plaisted 2000). The inability to generalize is also apparent in sessions in which they learn to perform theory of mind tasks. While they may master a task after a number of teaching trials, they fail to apply what they have learned during these trials

to everyday social situations (Swettenham 1996; Ozonoff & Miller 1995).

As we have seen, the theory of mind literature has not been primarily concerned with such impairments. Thus, there was a need for alternative accounts. As a result, two major ones have been offered. Firstly, according to the theory of weak central coherence (Frith 1989 2003; Frith & Happe 1994; Happe & Frith 2006), children with autism have an impaired built-in propensity to form coherence over various stimuli. Hence, they perform poorly on categorization and generalization tasks. Secondly, according to the enhanced perceptual processing hypothesis (Mottron & Burack 2001; Mottron, Dawson, Soulieres, Hubert, & Burack 2006; Plaisted 2001), children with autism have problems placing stimuli into the same category on a higher level, because they have superefficient low-level perceptual processing.

At first glance both theories, i.e. the weak central coherence and the enhanced perceptual processing hypotheses, seem to be convincing explanations of reduced generalization, rigid categorization, and non-typical concept formation in individuals with autism. These individuals do seem to process stimuli, both perceptual and linguistic, in a peculiar way. It has been found, for example, that they do not succumb to optical illusions (Happe 1996), that they perform very well on difficult visual search tasks (O'Riordan, Plaisted, Driver, & Baron-Cohen 2001), and are able to find hidden figures much more quickly than normally-developing children (Shah & Frith 1983). Furthermore, it has been found that children with autism do not memorize a rule-governed pattern when presented with a sequence of red and green counters (Frith 1970), are not influenced by the meaning of sentences in recall tasks (Aurnhammer-Frith 1969), and have a reduced ability to correctly pronounce homographs within the context of a sentence (Frith & Snowling 1983). More precisely, when asked to repeat the sequence of

differently colored counters, they repeat only the last two or three counters in the row instead of the overall rule-governed pattern: a pattern easily picked out by typically-developing children. In the case of random strings of words, normal children and children with autism have shown similar results, that is, both groups remember the end of the string. However, when the strings of words are partially meaningful, normal children remember the meaningful part and lose the rest, while children with autism remember the end of the string.

According to Frith's weak central coherence hypothesis, when the tendency to form coherence over a variety of stimuli functions properly, as it does in the case of normally-developing children, it prevents these children from performing well on embedded figure tests and forces them to succumb to optical illusions. This is because these children have the tendency to process stimuli as embedded in their surroundings, which means they cannot easily isolate stimuli from context. The same tendency enables typically-developing children to give priority to and memorize meaningful rather than meaningless strings of words on the recall tasks. This means that central coherence can be seen as operating on a lower perceptual levels as well as higher cognitive levels. However, as Plaisted (2001) correctly notices, the question is what psychological processes underlie the weak central coherence. Are they mainly processes involved in building mental models or are they processes involved in attentional control? In any case, they need to be clearly identified. Moreover, it needs to be clear how exactly the impairment in these underlying processes lead to what is generally called impaired central coherence. Until this is done, the theory of weak central coherence cannot have full explanatory value.

In order to avoid the problems faced by the theory of weak central coherence, Plaisted has developed a theory that aims to pinpoint the psychological mechanisms *responsible* for the

unique performance of individuals with autism on the aforementioned tasks, along with their apparently impaired ability to generalize and categorize objects and events in a flexible way. The theory also aims to explain why the concepts acquired by children with autism are fairly rigid. According to Plaisted, peculiarities in both perceptual and cognitive processing found in children with autism stem from their "reduced processing of the similarities that hold between stimuli and between situations" (Plaisted 2001: 159). This means that children with autism are not capable of keeping track of, that is, of focusing on, the features that different stimuli have in common. Instead, they focus on the unique features of stimuli. In this way, the enhanced perceptual processing hypothesis attempts to account for both the extraordinary ability of children with autism to quickly find embedded figures or small differences between two highly similar stimuli, and the failure of these same children to categorize in a non-rigid way or to generalize across similar objects and similar events. Furthermore, according to Plaisted, the enhanced perceptual processing in individuals with autism has a profound impact on the way these individuals acquire new concepts. The structure and the content of the concepts acquired necessarily differ from the structure and the content of concepts acquired by typically-developing children and adults. Plaisted argues that "the idea that perception in autism enhances the discriminability of stimuli predicts that category boundaries will be sharper and category content much narrower in autism than in typically developing individuals" (p. 165).

Plaisted's theory has an advantage over the weak central coherence hypothesis simply by virtue of being more specific about the underlying mechanisms that lead to the normal development (or in the case of children with autism impairments) of concept acquisition, generalization, and categorization. Even so, the theory has problems.

Plaisted's theory of enhanced perceptual processing is built upon a particular view of the nature of concepts, whereas the notion of similarity plays a crucial role in her theory of concept formation. Even though Plaisted does not say explicitly which theory of concept acquisition[15] she endorses (the prototype or to exemplar theory), it is uncontroversial that with respect to the structure of concepts, she considers that most of our concepts are graded rather than well-defined, and are created through the process of finding similarities between objects and events. Indeed, the same process of finding similarities that is responsible for concept acquisition underpins our ability to categorize objects and generalize across situations.

However, before siding with Plaisted, there is one important question we need to ask: what is similarity? The problem is that there are not many options when trying to define similarity. That is, we can define it in terms of matching and mismatching properties. So, for instance, in the well known theory of Tversky (1977), similarity is defined as a function of common and distinctive features weighted for salience and importance. Plaisted's notion of similarity is very similar to that of Tversky. She argues that in order to see similarity between different stimuli and situations, we need to be able to process that these stimuli "share sufficient features or elements in common" (p.159).

However, there are two reasons to be wary of the similarity-based theories of concepts. Firstly, similarity relationships among sets of entities depend on the features that we identify as important, *but what counts as an important feature depends on the context*. Or to put it differently, there is no unique answer to the question of how similar one entity is to another. Secondly, only within certain contexts can we individuate features or attributes. In other words, what counts as an attribute

15 For a review of the theories of concepts and theories of concept acquisition see Radenovic (2009).

or a feature is context dependent. Thus, any two entities can be arbitrarily similar or dissimilar, depending on the criterion of what is to count as a relevant attribute. This means that what counts as a relevant feature when we look for similarities between different entities, is not context-independent but, rather, is determined by the general background knowledge we have about that domain and our particular goal in that situation (for a critique of the concept of similarity and its role in the concept acquisition see, for example, Quine 1969; Goodman 1972; Kail 1989; Lakoff 1987; Medin & Wattenmaker 1987; Murphy 1993; Murphy & Medin 1985).

Now, if, unlike Plaisted, we accept that features of objects and events as well as perception of similarities are context dependent, we need to explain how an infant learns to distinguish between relevant and irrelevant features, and how the child learns to compare things and judge their similarity by adopting different criteria.[16] But for this purpose we need to invoke social learning. Indeed, social learning is possible only through ongoing interaction between the child, the world, and other people. So, what seems to be the case is that social interaction and social cognition are of crucial importance for concept acquisition and categorization and cannot be learned independently of social practices. I will come back to some of these issues in the final chapter.

16 Similar questions have been posed in the literature. For instance, Klin, Jones, Schultz, & Volkmar (2003) ask why some aspects of the environment are more salient to a child than others. Their answer is that infants focus on the aspects of the world that have certain survival value. Although such an explanation is far better than explanations grounded in the context-neutral, similarity-based theories, it still does not provide an explanation of how the survival value is to be determined by a child and how exactly the underlying mechanism for determining survival value functions. To say that it is hard-wired and evolutionary-selected is only to say how it originated in evolutionary time; it does not say how it develops in a particular individual.

4. Concluding remarks

As we will see in the next chapter, in order to explain social and cognitive deficiencies of children with autism we will need the non-reductive integrative model of autism. What this means is that we will need to relate perceptual, cognitive, and social development more closely. Reductive explanations will not be available to us primarily because the deficits in abstract reasoning are deeply connected to the deficits in social cognition while problems with sensory integration and atypical sensory perception do have a profound influence on all areas of psychological development, but not in a simplistic and straightforward way as Plaisted has proposed.

My first goal in the upcoming final chapter is to show that some accounts of autism, those that focus on social cognition and those that focus on cognitive deficits, somewhat simplify the clinical picture of the ASD. That is, when we take a closer look at the clinical picture of autism we notice that it is rather messy and that involves other unusual tendencies and behaviours of children. It is not unreasonable to assume that these tendencies are not just side effects but that they could play a causal role in the onset of autism. For this purpose it would be important to examine closely the deficiencies in sensory processing, and sensory integration and see how such deficiencies might lead to derailment of social cognition and abstract reasoning. Or to put it differently, it is worth exploring if the impairment in mind reading capacity as well as in abstract reasoning is the consequence of the abnormalities in the sensory processing and integration. But, this is an empirical question and it requires careful evaluation of the evidence.

Given this fuller clinical picture of ASD and possible etiology that emerges from it, my next goal is to explore how well the case of ASD goes with one philosophical approach to the problem of other minds: the one that is now more or less classical in philosophical writings but had no significant influence outside of it. The approach that I have in mind is the Wittgensteinian attitudinal approach. I will examine if this approach captures better the very nature of human social cognition as well as if it can help us understand autism better. Essentially, my goal is to explore how the non-Cartesian Wittgenstenian take on the nature of mind scores when naturalized, i.e. when we provide a developmental account how the mind along with social cognition is being constituted through the interaction between the child and a caregiver. Finally, in the concluding remarks I will turn once again to the Cartesian presuppositions about the human mind and will examine what we gain if we replace it with the Wittgensteininan attitudinal approach.

Chapter 4
The case of autism and the attitudinal Wittgensteinian approach to other minds

As we have seen in the previous chapter, reductive explanations of autism are problematic for various reasons. Either they do not address, in an integrative way, a variety of sensory, cognitive and social problems of autism such as those that focus on deficits in social cognition (most prominently Baron-Cohen's 'Theory of Mind' account), or they do tackle it but the explanation they offer is overly simplistic (such as the case of Pleistad's enhanced perceptual processing hypothesis). In the first part of this chapter my goal is to fix these shortcomings and develop a tentative yet more integrative and comprehensive story of autism. I want to do this by keeping in mind the lessons that we have learned so far. Firstly, the impairment of concept acquisition, categorization, and generalization (known as cognitive deficit in autism) is essentially a social impairment and cannot be explained solely by impairments in either sensory processing or some higher cognitive capacity. What this means is that the impairment in early social interaction, which results in impaired social orienting, joint attention, and social learning, profoundly impairs the child's ability to learn new concepts, develop categorization skills, and generalize in novel situations. I will say more about each of these in the following sections.

Secondly, it seems important to acknowledge (as Happe and Frith do) that the impairment in sensory integration and intersensory perception might be of crucial importance for normal as well as derailed psychological development, including social, cognitive, and language development. Putting the disruption of these basic physiological processes at the very roots of the development of ASD seems more likely than explaining them away (as Carruthers does) as side effects of the impaired theory of mind module. So, my first goal in this chapter is to build a more comprehensive picture of autism starting from the basic physiological deficits; deficits that are likely to interrupt initial social interaction between a child and a caregiver leading to derailment of normal cognitive and language development. I will try to convince you that such a picture is in accord with the numerous empirical findings researchers have collected so far.

In the final sections, I will go back to some philosophical issues and the philosophical problem of other minds. As we have seen, our theories of social cognition have been profoundly influenced by the Cartesian view of the mind. In these sections I want to examine a non-Cartesian view. More specifically I want to examine the Wittgensteinian attitudinal approach as developed and proposed by Ter Hark (1991) and Hyslop (1995). I am going to do this from the perspective of the autistic spectrum disorders. According to the attitudinal approach, our knowledge of other minds (knowledge that comes in the form of beliefs) is grounded in a particular *attitude* toward others, namely the one in which we already take for granted (intuitively) that others have minds. I will argue that having such attitude is the prerequisite of more advanced conceptual knowledge of other minds (the one that Theory-theorists put in the core of our social cognition). But, unlike simulation theorists I will make the case that such an attitude is not the result of the simulation abilities of the Cartesian mind but emerges from the ongoing interaction between a child and a caregiver. Children with autism who do not participate in such interactions fail to develop such an attitude. Consequently, they need to use different psycho-social mechanisms to solve the problem of other minds. Interestingly enough, they often seem to be constructing a theory about others and use 'coding' of faces to infer what other people think and feel. But, without the intuitive attitude, they are more frequently off in their interpretations than individuals who do have such an attitude. These insights are of great importance for philosophers and psychologists respectively, as they might strengthen the non-Cartesian views of mind and also inspire new empirical research.

1. The case of autism: integrated

a) Intersensory perception in children with autism

Although there is no agreement in the literature with respect to the nature and development of sensory processing in these children, there seems to be an agreement that there is something atypical in the way they process and react to sensory input. The reports of atypical sensory processing in the population of autistic children date back to Kanner's initial clinical reports (1943), in which he noticed that children with autism seem to devote more attention to details than to wholes. In the following decades, many researchers have reported similar processing problems in this population of children (Brock, Brown, & Boucher 2002; Frith 1989; Happe 2005; Hermelin & O'Connor 1970; Hutt, Hutt, Lee, & Ounsted 1964; Mottron, Dawson, Soulieres, Hubert, & Burack 2005). In addition, parents of children with autism often report unusual sensory reactions early in the development of their children. These reports are of crucial importance for the diagnosis of autism in the first two years of life (Dahlgren & Gillberg 1989). Finally, autobiographical reports of individuals with autism (Attwood 1998; Grandin 1988, 2000; Williams 1996) and retrospective video analyses (Adrien, Perrot, & Hameury 1991; Adrien, Perrot, & Sauvage 1992; Baranek 1999; Losche 1990; Osterling & Dawson 1994; Werner, Dawson, & Osterling, 2000), also support the hypothesis that the sensory-perceptual experience of people with autism differs in an important way from the experience of typically-developing individuals.

Currently, several theories aim to account for the peculiar way children with autism organize, process, and act on sensory input. One is Frith's weak central coherence theory, and another is Plaisted's enhanced perceptual processing hypothesis. However, there are a few alternatives to these.

According to Brock's theory (2002), for example, the impairment that causes unusual sensory reactions in children with autism lies in the so-called temporal binding. Other neurological researchers have suggested that the cause of sensory difficulties in this population might lie in the structural abnormalities in the cerebellums of persons with autism. They hypothesize that because of such abnormalities, children with autism have problems shifting attention within visual modalities and between visual and auditory modalities (Ciesielski, Knight, Prince, Harris, & Handmaker 1995; Courchesne, Townsend, & Akshoomoff 1994; Martineau et al. 1992; Townsend, Harris, & Courchesne 1996). Still others argue that according to the general underconnectivity theory (Just, Cherkassky, Keller, & Minshew 2004) children with autism have general problems in coordinating different sources of information from different modalities because of weak connectivity across brain regions.

Theories of sensory difficulties in children with autism differ in the way they explain these difficulties and what they posit as *the* main difficulty. That is, they do not agree as to the nature of the problem of sensory processing, nor do they agree as to the processes involved in the sensory impairment. However, they all "implicate atypical sensory processing as a core feature of autism" (Iarocci & McDonald 2006, p. 81).

Now, let us see more closely how atypical sensory processing might deter development of social cognition, language, and cognitive capacities such as abstract thinking, categorization, and generalization.

b) Developmental origins of social cognition

As we have seen in the previous chapters, different theories have identified different psychological mechanisms as the core mechanism of social cognition. Theory-theorists have proposed a theory-like module, while simulation theorists insisted that the core vehicle of social cognition is simulation. However, when we take a developmental perspective, the key question is: which capacities relevant to social cognition emerge at which developmental stage? The capacity to participate in joint attentional scenes is usually identified as the most important capacity for further development of language as well as social cognition. Joint attention refers to the ability to "coordinate attention between interactive social partners with respect to objects or events in order to share awareness of the objects and events" (Mundy et al. 1986, p. 657).

It is well known that the participation in joint attentional scenes emerges very late in the development of children with autism (Charman 2003; Kasari, Sigman, Mundi, & Yirmiya 1990; Leekam, Lopez, & Moore 2000; Loveland & Landry 1986; Mundy & Crowson 1997). Considerable delay in joint attention is usually seen as the main culprit in the delay of language acquisition and the impaired development of social cognition in these children. The question is, however, what prevents them from participating in such interactions?

Two kinds of theories have been proposed to account for normal and derailed development of joint attention; one that is more in accord with the simulation theory approach and the

other that is more in accord with the Theory-theory approach. According to the former, the impairment is considered to be affective rather than cognitive. This means that the proponents of this approach explain the impairment in joint attention in children with autism by their impaired emotional interaction with their caregivers. They argue that due to this impairment, children with autism are prevented from developing normal intersubjective relations (Hobson 1993) and from engaging in normal socio-emotional development (Mundy 1995). Basically, their argument is that because of impaired socio-emotional development, children with autism show problems with face-to-face gaze, direction of attention, and appropriate patterning of behaviour within interactions. This necessarily impairs their ability to participate in joint attentional scenes.

According to the other approach, the origin of the impaired joint attention is primarily cognitive. The proponents of this view are not interested in socio-affective development and argue instead that what is impaired in children with autism is their understanding of the caregiver's attention to an object. In other words, they argue that the impairment occurs because children with autism cannot represent the relation between caregiver and the object to which the caregiver is attending. Not surprisingly, such impairment is usually taken to be part of a larger theory of mind impairment (Baron-Cohen 1995; Baron-Cohen, Leslie, & Frith 1985).

However, both of these approaches suffer from the lack of details when it comes to underlying psychological mechanisms responsible for development of joint attention. That is to say, both views, if they are to be useful, need further development. Thus, the next main goal of the proponents of both camps, respectively, is to determine with further research what way socio-emotional development brings about joint attention and/or what underlying mechanisms prevent the child from developing proper understanding of the caregiver's attention.

Recent theories proposed to account for the origins and development of joint attention aim to do exactly this: to identify the mechanisms responsible for the development of joint attention and its early precursors. Now, what is interesting to see is that these theories do not pose the question of whether the impairment in joint attention is essentially affective or cognitive. In fact, when we take a closer look at these theories the first important thing we notice is that upon closer inspection of the underlying culprits for derailed joint attention in children with autism, the impairment appears to have links to not just affective and cognitive causes but also to sensory development.

So, how do these new theories approach the question of development of joint attention? Their common strategy is to identify the precursors of joint attention and then to try to explain how these precursors emerge in the course of development. For instance, social orienting is usually taken to be one of the main precursors of joint attention (for a comprehensive review, see Dawson et al. 2004). Social orienting refers to children's ability to "spontaneously orient to naturally occurring social stimuli in their environment" (Dawson et al. 2004, p. 272). Usually, children who have difficulties with social orienting also have difficulties with joint attention (Mundy & Neal 2001). Thus, it has been argued that if the child fails to orient to social stimuli, that is, if she fails to show appropriate attraction to people, particularly to the sounds and features of their faces, this will necessarily impair her ability to engage in joint attentional scenes (Dawson, Meltzoff, Osterling, Rinaldi & Brown 1998; Mundy & Neal, 2001).

The next question is what underlies the child's ability to orient to social stimuli successfully. Here, several theories have been proposed as well. Some researchers have argued that the impairment of social orienting in children with autism is a special case of a more general impairment in attentional functioning (e.g. Bryson, Wainwright-Sharp, & Smith 1990;

Courchesne et al. 1994; Dawson & Lewy 1989a, 1989b). Of course, they disagree about the exact nature of this more general impairment. According to Courchesne, Chisum, and Townsend (1995), early social exchanges are quite demanding and require rapid attentional shifts between different stimuli. They argue that this is exactly what children with autism cannot do. Meanwhile, other researchers, such as Just, Cherkassky, Keller, and Minshew (2004), hold that the ability to shift attention is not the main culprit. In their view, the very nature of social stimuli is far too complex. In other words, given that social stimuli require parallel processing (i.e. the processing of facial expression, speech, gestures, and the like), in addition to the processing difficulties that children with autism have, children with autism do not pay attention to such stimuli. Thus, in order to explain the processing difficulties in this population of children they turn to the underconnectivity of the brain regions. Furthermore, some researchers argue that children with autism are not drawn to social stimuli because their motivational neurological mechanism fails to assign a reward value to social contact. Therefore, they do not naturally engage in social interaction (Mundy 1995; Panskepp 1987).

All of the aforementioned theories are not mutually exclusive even though it might seem as they are at first glance. So, at the end of the day, it might turn out that all of these factors (the underconnectivity of brain regions which implies processing impairment, as well as an impaired reward mechanism) are in play and jointly contribute to the impaired social orienting and the impaired processing of emotional expressions, which together lead to impaired joint attention in children with autism.

Walker-Andrews (1997) has done an important series of studies that indicate that typically-developing children first come to recognize emotional expressions by relying on intersensory perceptions. Later, they are able to focus on voice or facial expression and to extract emotional meaning from them

alone. What this means is that the ability to recognize certain expressions depends on the proper integration of stimuli coming through vision, sound, and touch. Consequently, if the sensory channels do not work properly, as it seems to be the case with children with autism, the child will not be able to recognize emotional expressions, which will thus compromise her ability to grasp the emotional meanings of these expressions. This also might compromise the development of the neuro-affective motivation system (reward system) which, in turn, will compromise the child's interest in engaging in social interaction, thereby further derailing her social development.

Indeed, this is not the only possible causal chain of events. In fact, the causal chain can go in the opposite direction: it might turn out that because of an impairment in the neuro-affective motivation system in the brain, the child does not enter social interactions, leading to abnormal brain development and the underconnectivity of brain regions. If this is the case, children with autism would have difficulties in intersensory processing and exhibit odd reactions to sensory stimuli, thus further derailing their social development. Determining what this causal chain looks like is crucial for our understanding of development of social cognition, and further research in this area is necessary.

However, what is important to notice is that once we start doing such research we are already very far away from the theories of social cognition that we have started with, i.e. the Theory-theory or the simulation theory. At this level these approaches appear to be surprisingly uninformative. To argue that the child's theory of mind module or simulation skill is impaired and causes autism does not help us much in understanding the kinds of physiological and neurological mechanisms involved. But, once we start unpacking these mechanisms, then the Theory-theory approach, the simulation theory approach and all other theories of this kind become at best redundant.

Moreover, this shows how dangerously misleading such theories can be as they lead us into believing that we have actually explained something (the development and the causes of autism in this case) while leaving all the important mechanisms unidentified.[17]

Finally, whatever the causal chain of normal or derailed early social interaction turns out to be, intersensory perception and sensory integration seem to be playing very important roles in these early parent-child exchanges. Now, let us see how the disturbances in intersensory perception along with the early social interaction might affect abstract reasoning and language development.

17 For a review of some criteria for good developmental (mechanical) explanations see Radenovic, 2013.

c) Developmental origins of abstract reasoning

As already noted, the development of categorization, concept acquisition, and generalization cannot be entirely grounded in perceptual learning; nor can it be explained merely by mechanisms independent from social interaction (as Frith, Happe, and Pleisted seem to think). This means that learning to categorize objects by their shape, color, material, the way they move, the way they are used, or by numerous other characteristics we choose to be relevant in a particular situation, is highly dependent on social learning, which, in turn, is highly dependent on the ability of a child to participate in social activities with caregivers. It is safe to assume that it is mostly (if not solely) through social learning, that the child starts to form functional categories, learns to be more flexible in categorization, and with the development of language, learns to make more abstract similarity comparisons between objects and between events. In other words, even if the child continues to discover the various properties of objects when playing on her own, the first impetus for such solo experimentation comes from caregiver-child interaction in which the caregiver directs the child's attention to different ways she can play with and use objects. In this way, the caregiver implicitly directs the child's attention to different properties of objects, including properties which are on the surface, such as color and shape, as well as more hidden properties that the child discovers only if she manipulates the object and sees what it can do in the world.

Thus, during everyday routines in which both caregiver and a child participate, the child gets to deal with different objects

and starts to associate different objects with the same or different themes (eating, bedtime, going to daycare, and the like). Through participating in daily routines, the child also becomes familiar with the functional properties of objects. That is to say, the child starts differentiating between things that she can play with, things that she can eat, things that she brushes her teeth with, and the like. It is safe to assume that the saliency of the functional properties of objects emerges through participation in such activities.

The importance of the development of thematic and functional categories for normal category development and concept acquisition has been acknowledged in the literature. Fivush (1987), following Nelson (1974), argues that many categories are initially formed on the basis of common functions rather than on shared perceptual features. According to this view, the child initially defines 'ball' as something to roll, and anything that fulfills this function will qualify as a ball. Fivush relates these first functional categories to scripts (routines) in which the child participates on everyday basis. Scripts provide the context for defining the function of objects where different objects can fulfill the same function. For instance, during the eating routine, the child eats, but the food item and the utensils can vary. (The child can eat apples or bread, and drink milk or juice. She can eat from a bowl or a plate.) This leads Fivush to speculate that developmentally-speaking, some taxonomic categories such as clothing and food may initially be based on functional substitutability of different items in the different routines.

Now, we do not have to be committed to Fivush's explanation of the origins of taxonomic categories in order to hypothesize that during daily routines, caregivers direct the child's attention to different aspects of objects and situations, and in this way, teaches her (among other things) about their relevant and irrelevant aspects. More specifically, it seems that during

these activities, caregivers teach a child how to use objects to do different things. In this way, caregivers highlight or make salient to a child how these objects are conventionally used to fulfill certain tasks. We can also hypothesize that through these routines, the child learns that things can be categorized in different ways (things to eat, things to play with, and the like), and that sometimes, these categories can be replaced (e.g. she can also play with the things that she usually eats). Whether the parent is going to be successful in communicating to a child all of the above depends on various factors, but one of the most important is whether the child is eager to participate in the activities of the adults around her (Valsiner 1987).

Autistic children certainly have everyday routines (they have meals, they go to bed, and the like) but they do not seem to participate in these activities in the same fashion as typically-developing children – they lack normal social contact with the caregiver during these activities. We can hypothesize that this lack of social contact prevents them from engaging in the kind of social learning which would permit them to learn different ways to manipulate objects, replace them with similar ones, and conventional ways to use them, and hence to form functional categories. This might be one of the causes for the impairment in their categorization abilities.

Williams, Kendel-Scott, and Costal (2005) have done a qualitative analysis of the problems that parents of children with autism encounter when trying to teach their children everyday object use through everyday routines. Parents reported that one of the main obstacles they encountered in their teaching attempts was their child's lack of interest in achieving goals/accomplishing tasks the way other people do. This indicates that such interest is crucial for successful social learning.

But functional categories and functional similarities between objects and events are not the only kinds of categories and/or similarities. The child needs to learn to pay attention

to other kinds of perceptual and relational similarities in the course of normal development of abstract thought. According to Gentner and Kotovsky's relational shift hypothesis (1996), children are initially able to perceive overall, literal similarities between objects and between events.[18] With further development, children begin to notice similarities between relations and higher order relations (i.e. they learn to notice more abstract relations between objects and events). Kotovsky and Gentner have shown that children's ability to perceive more abstract similarities increases with their knowledge of the domain. Indeed, the more instructions about the domain children receive, the better they are in analogical similarities. Moreover, the more instructions they receive, the better they are in decontextualizing or disembedding the relations between given objects and in applying learned analogies in other domains.

In a similar fashion, Gentner and Medina (1998) have shown that learning more abstract relational similarities is highly dependent on and is guided by cultural and linguistic patterns. In other words, cultural learning and language acquisition seem to be the most important factors in the development of a child's ability to perceive and make note of more abstract relational similarities.

It is not surprising that language acquisition is a crucial factor in category development, concept acquisition, and the development of abstract thought. It has been shown that language acquisition shapes the development of concept acquisition and category formation (see. e.g. Markman 1989), and contributes in an important way to flexibility in categorization tasks (see e.g. Ellis & Oakes 2006). In other words, once language kicks in, along with the child's ability to communicate linguistically, language is the main medium of social learning and, as such,

18 As we have seen, proper intersensory processing is likely to play a crucial role in the way that children's ability to notice an initial similarity between objects and events develops.

is the driving force behind category development and concept acquisition. Although language might not be the only factor involved in the development of abstract reasoning,[19] it definitely helps a child to learn how to make more abstract relational comparisons and analogies that go beyond the immediate visual matching between components of objects and events.

However, before the child acquires language, the main medium for social learning is nonlinguistic communication. Thus, in order to account for the more advanced forms of social learning via linguistic communication, it is important to account for the early precursors, which are grounded in prelinguistic communication.

This is the point where the stories of language development, cognition, and social cognition becomes basically one story. In other words, as we go further back in ontogenetic time to find the roots either of language, or social cognition, or categorization skills we inevitably end with several important precursors of all three: early social interaction and basic physiological functioning i.e. sensory perception and integration. Thus, in the case of abstract reasoning we look for the precursors of non-linguistic communication. Such preverbal communication starts in the first month of life but comes into full force with the emergence of joint attention.[20] It is important to note that the child who is able to engage in joint attention is able to

19 In order to get a fuller sense of the role that language plays in the development of abstract reasoning, it is important to compare the development of human abilities with the development of abstract reasoning of our close evolutionary relatives: apes. This is a topic on its own, and there is a vast literature on it. However, for our purposes here, we can take it for granted that language contributes in an essential way to concept acquisition and category development in human ontogeny.

20 In the literature on the development of social learning, there is a similar emphasis on the importance of joint attention. While it has been argued that social learning starts in the first months of life, social learning attains its most efficient form with the emergence of joint attention (see e.g., Tomasello et al. 2005)

make use of the caregiver's communicative signals. In other words, through preverbal communicative signals, the child and the caregiver are able to follow and direct each other's attention. The clear sign that the child is able to make use of the communicative signals of a caregiver can be seen in her ability to follow the gaze of the caregiver and determine the object(s) to which the caregiver intends her to attend.

It is probable that the nature and the development of these preverbal signals is the result of the child's capacity to attend to and make sense of the caregiver's emotional expressions. Firstly, being preverbal, these signals consist of expressions of approval, disapproval, surprise, and the like. That is, they mostly consist of emotional expressions. Secondly, it seems that along with the more conventional communicative gestures, such as pointing,[21] emotional expressions successfully direct the attention of a communicative partner to a particular object or a feature of an object in the joint attentional scene. In turn, joint attentional episodes are often punctuated and motivated by affective engagement with another (Paparella, D'Angiola, & Kasari 2001; Paparella & Kasari 2002).

21 Given that the emergence of social orienting and attention to distress occurs long before the child acquires conventional communicative gestures, it would be worthwhile to explore how the former relate to the latter and whether the origins of communicative gestures lie in the more basic understanding of emotional expressions.

d) Some concluding remarks

Let me summarize a few important points reached in the previous sections. From the developmental perspective there is an important causal relation (unpacked as yet entirely) between intersensory perception and development of social cognition, language and abstract thought. It is crucial to determine the exact nature of the relationship between the impaired intersensory processing in children with autism and their social impairment. Further research might show that the cause of impaired intersensory processing and the underconnectivity of the brain regions might lie in the impaired reward mechanisms of the brain, due to which children with autism are not sufficiently motivated to seek for or engage in social interaction. In this case, the lack of initial social interaction impairs the development of the brain and causes the underconnectivity of the brain regions which, in turn, results in difficulties in intersensory perception. Such difficulties in intersensory processing would further derail the child's ability to engage in social interactions.

However, it may turn out that intersensory difficulties in children with autism are basic ones, and might be the primary cause of the impaired reward mechanism in the brain. In this case, children with autism do not engage in early social orienting and social interaction because the motivational reward mechanism of the brain is impaired due to impaired sensory processing.

Regardless of which causal story is correct, it is important to note that the impairment in early social interaction, which results in impaired social orienting, joint attention, and social learning, profoundly impairs the child's ability to learn new

concepts, develop categorization skills, and generalize in novel situations. It is also important to note that the Theory-theory and the simulation theory approach do not explain development of social cognition in a satisfactory way, as it turns out that such cognition develops as a result of proper functioning of neurophysiological processes involving intersensory perception, integration, and underconnectivity of the brain regions. Now, to cover all of these processes with a concept such as the theory of mind module does not help us understand them better.

In the final sections I turn to some philosophical implications of the insights we have reached here. Our next question is whether the aforementioned findings cast more light on our philosophical assumptions about the nature of the mind. But, before that, it is time to say something about one philosophical solution to the problem of other minds that we have not talked about as yet. This solution is non-Cartesian. It is known as Wittgensteinian and it promises to triumph over the skeptic.

2. The attitudinal approach to other minds

In the second chapter, above, I have talked in some detail about Cartesian solutions to the philosophical problem of other minds. As we have seen, these Cartesian approaches did have a profound impact on the theories of social cognition discussed. Furthermore, they have shaped some of the most influential theories of autism such as Baron-Cohen's theory according to which children with autism have an impairment of the theory of mind module. Now, it is time to see how the non-Cartesian, essentially Wittgensteinian, solutions to the problem of other minds look like. After all, these solutions have been fiercely debated in the circles of philosophers of language. However, they have never really crossed into the neighboring disciplines of psychology. Even though there are several versions of a Wittgensteinian-influenced solution, I will focus on two: the criteriological argument developed by Norman Malcolm (1958, 1959) and the less known attitudinal approach originally developed by Ter Hark (1991). The latter is of great importance to me as it is my contention that this approach fits best the complex developmental story of autism.

a) The Criterial approach

A variety of Wittgensteinian solutions[22] to the problem of other minds have been advanced by language philosophers of the twentieth century. In its standard form, a Wittgensteinian approach aims to overcome the shortcomings of the analogical argument and to successfully respond to the skeptical worries. If we go back to the analogical argument we can see that this argument is built on two main presuppositions. Firstly, it starts off with the assumption that we know ourselves directly (by intuition) while we infer what other people think and feel by analogy with ourselves. Secondly, it presupposes that the relation between our mental states and behavioural states is causal and contingent. Now, in the second chapter we have seen that the argument from analogy faces some problems. One is related to the quality of the sample. Namely, when we generalize to others (i.e. when we make inferences about their inner states) our induction base is one: our own mind. This in itself is a problem. The sample of one is a poor sample. Also, without publicly shared language (language shared by members of a group) it is hard to see how we can individuate our own inner states let alone detect the causal relation between inner and behavioural states.

Wittgensteinians thought that the argument from analogy could not possibly overcome these shortcomings. So, instead of

22 There have been the old and the new Wittgensteinian arguments. The former has been proposed and defended by Norman Malcolm (1958, 1959). The latter has been defended by Saul Kripke (1982). As I am interested in the attitudinal approach proposed by M.R.M. Ter Hark I will not be concerned with the differences between the other two.

fixing it they insisted that we need to abandon its main presuppositions. What this means is that we need to reconceptualise the way we understand self-knowledge as well as the relation between mental and behavioural states.

In the later period of his life, particularly while writing *Philosophical Investigations* (1953), Wittgenstein was concerned with these issues. Not all philosophers agree about what Wittgenstein really had in mind and what his position really was. However, most do agree that he rejected the idea that we know our own mental states by introspection and that the relation between mental states and behaviour is causal, thus rejecting both main presuppositions of the analogical argument.[23] Both of these points require some unpacking.

In Malcom's and Hacker's interpretation of Wittgenstein, Wittgenstein rejected the view that we have introspective knowledge about our inner states. What this means is that we do not observe our own thoughts and feelings with the mind's eye. In other words, there is no intellectual, inner eye that perceives (as on the screen) our inner life. Moreover, according to Malcolm and Hacker, we do not make the connection between inner mental states and outer behaviour by some act of introspection. Of course, this does not mean that we are not aware of how we feel, what we think, and what we want to do. Of course, we are. However, this self-awareness is not some kind of introspective act; the act that presupposes that we are (independent) observers of our own mental life. In other words, our awareness of our inner states (the way we feel and what we think) does not come in the form of theoretical or intuitive knowledge. It is neither indirect nor direct. Also, in Malcolm's

23 An introductory survey of different interpretations of Wittgenstein's take on language, mind, and conceptual versus empirical connection between inner and outer can be found in: Miller, Alexander and Crispin Wright, *Rule-Following and Meaning* (2002). However, I will focus on the standard interpretation offered by Malcolm (1958, 1959) and later developed by Hacker (1972).

and Hacker's view, the way our our inner states and outer behaviour relate is not through some external, causal, and contingent connection. How we feel and what we think is internally related to our outer behaviour while this outer behaviour is the expression of our inner life.[24] In other words, inner mental life and behaviour are not two different entities in a causal relationship but rather two aspects of one phenomenon. I will come back to the developmental origins of this internal link between inner mental life and outer behaviour later in this chapter, but for now it is important to notice that Wittgenstein and Wittgensteinians such as Malcolm and Hacker do offer a way to reconsider the inner/outer distinction as well as suggest how we should understand self-knowledge.

Once we abandon the concept of introspective knowledge in our own case and a contingent (causal) empirical connection between our inner lives and behaviour we are in a position to examine how these insights affect the problem of other minds. So, if we accept that there is an internal link between our inner feelings and our behaviour, we can assume that such a link obtains in the case of other people as well. The first interesting implication, if such a link does obtain, can be stated in the following way: we observe other people's *mental states* when we observe other people's *behaviour*. Why? This is because the link between inner and outer states is conceptual (internal) not empirical. But, what exactly does it mean 'to observe the mental lives of others in their behaviour'? Furthermore, what does it mean to say that the relationship between inner and outer states is not empirical but conceptual?

For Malcolm and Hacker to say that the nature of the relationship between inner mental life and outer behaviour is

24 Even though Malcolm and Hacker portray Wittgenstein as holding firmly to this view there are some indications pointed by L. Kojen (2009) that Wittgenstein himself had doubts that all mental terms and their meanings could be identified and reduced to one function: our expression of the inner mental life.

conceptual means that our concept of behaviour already involves the concepts of beliefs, desires, joys, pains and the like. Due to our linguistic capacities and abstract reasoning we can make an artificial distinction between the two (inner and outer) and think of them as separate events or phenomena, but 'crying' and 'pain' come together conceptually. In our own case, crying is the expression of pain. When it comes to others, their crying meets the criteria by which we determine that they are in pain. In other words, this means that when we observe other people with the goal to determine how they feel (or what they think), we judge whether their behaviour passes the criteria for what e.g. being in pain or being happy is. When we engage in such activity we do perceive in others pain in their pain behaviour. We do not conclude or infer from crying that somebody is in pain. We *see* that they are in pain as we know what "pain" means and that meaning involves a particular kind of behaviour.

The Wittgensteinian approach as presented here has important implications for skepticism about other minds. In its standard form (e.g. in Malcolm's or Hacker's interpretation) when somebody passes the test of criteria for being in pain, this serves as justification of our belief that they are indeed in pain. Indeed, such justification does not come from inductive inference nor does it consist of gathering empirical evidence. Since the relation between inner states and outer behaviour is not causal but conceptual the justification for the existence of other minds cannot be empirical at all. As a result, we do not need to worry about the inductive base that is too small nor about the way we make an intuitive connection between inner and outer (or the way we generalize such knowledge to others) as we do not make such a connection at all. The way we know what other people feel is by knowing the meaning of the words. When we know the meaning of the words (such as "pain") we can see their pain in their behaviour. Thus, when other people

pass the criteria test for being in pain, we are justified in knowing that they are indeed in pain. We do not have to worry about skeptical objections any more.

The Wittgensteinian approach presented above, the one developed by Malcolm and Hacker, is what is usually called the criterial approach to other minds. Let me now turn and see how the criterial approach differs from the other version of the Wittgensteinian approach, namely the attitudinal approach.

b) The attitudinal approach

The criterial and the attitudinal approach do share the assumptions related to the inner/outer connection and the nature of self-knowledge; the assumptions according to which the relationship between inner and outer is conceptual and our self-knowledge is not based on introspection. This is what makes them both Wittgensteinian. Now, the main difference between the two is in the way they understand the nature of our knowledge of others. On one hand, according to the criterial approach, our knowledge of others comes in the form of beliefs about others. At first glance this seems right. On the other hand, according to the attitudinal approach our knowledge of others does not come in the form of beliefs at all.[25] Now, at first glance this seems odd and I will come back to these issues shortly.

But, let me go back to the skeptical worries first. If we have beliefs about other people's mental states, (which we do, according to the criterial approach), the question is whether we can justify such beliefs? As we have seen, for the proponents of the criterial approach this justification does not come from induction or in the form of empirical evidence because the relation between inner life and behaviour is not empirical. However, the justification is not of a logical nature either. More precisely, it does not, and cannot come in the form of logical entailment. This is because the relationship between the inner

25 As we will see when I turn to the developmental issues (development of mind, social cognition, language), these two approaches are not necessarily mutually exclusive. However, the research in developmental psychology indicates that the attitudinal approach to other minds develops first and serves as the basis for language development within which the cirterial approach to other minds makes sense.

mental states and outer behaviour is not, strictly speaking, logical either. If the connection were logical, then our mental states would entail their behavioural manifestations. Or, to put it differently, outer manifestations would be deducible from our inner feelings. However, we all know that this cannot be the case. That is, we are all able (more or less successfully) to hide or fake our feelings. Given this simple fact of our lives there cannot be logical entailment between the two. As Hyslop correctly notices, the standard criterial approach aims to find a 'midway between entailment and induction' to justify our knowledge of other minds.

To summarize, the goal of the criterial approach is to defend our knowledge about other minds within the framework of standard beliefs/desires psychology and this is done in the following way; we justify our beliefs about other people's mental states through examining the conceptual criteria for being in a certain mental state and whether the persons in question fulfil such criteria. When a person fulfils the criteria for a particular mental state we are *justified* in believing that they are in such a state. Malcolm's famous example of scratching and itching nicely illustrates this point (Malcolm 1959). We know that there us a connection between itching and scratching. As we have seen, according to the criterial approach, the connection between the two is conceptual. So, when we see somebody scratching we *know* they are itching. For Malcolm, this is not inductive or logical truth but conceptual. Scratching fulfills the criteria for itching. Our belief that whoever is scratching is itching as well is justified in this way.

Now, Hyslop's view is that this standard criterial approach encounters a serious problem: if the relationship between mental states and behaviour is not one of logical entailment, how could the criterial justification provide certainty? It seems that a skeptic requires something like logical certainty in order to be convinced that we know that other minds exist. Furthermore,

given the possibility of pretending and lying, many would argue that the relations between inner states and outer behaviour are a bit further from logical entailment and closer to empirical contingency. To try to be in between and say that their relationship is not empirical but is of a conceptual/logical nature of a particular kind that does not involve logical entailment remains to be clarified and cannot be taken for granted.

Now, aforementioned worries could be overcome, but for that purpose we need to abandon the view that our knowledge of other minds comes in the form of beliefs. That is, we can argue that that since we know that other minds exist in some other way (and spell out what that way is) we do not need to justify our beliefs about their existence. Let us now see what this means. Even though my main concern is not with the skeptic and her worries[26] I want to examine closer the position that starts off with the assumption that our knowledge of other minds is not of a propositional nature but rather comes in the form of an attitude.

If we abandon the concept of knowledge about other people's mental states as knowledge coming in the form of propositional attitudes, i.e. beliefs, we still need to explain what this knowledge is and why we seem to have and form beliefs about others on a regular basis. Let us first see what Hyslop has to say about this. As for our self-knowledge he says: "Something perhaps deeper than knowledge applies in one's own case, something prelinguistic even." (1995, p. 124). As for other people and their minds, Hyslop says that our knowledge of them is rather a form of an attitude (also probably prelinguistic) that already presupposes treating others as minds and never as mere bodies. When Hyslop argues that we are aware of ourselves on a deeper, prelinguistic level and that we take this attitude toward others, the attitude that includes their minds as existent,

26 I have developed an argument against skeptic elsewhere in Radenovic, 2014.

he aims to distinguish linguistic knowledge that comes in the form of propositions, propositional attitudes, shortly, in the form of beliefs from immediacy of self-awareness and strong intuition that other people indeed have feelings and thoughts.

In a sense, these insights go beyond the Wittgensteinian point that inner life and outer behaviour are conceptually related. That is, according to the attitudinal approach, as described by Hyslop, the connection between the inner and the outer is prelinguistic, so it cannot be conceptual (at least not in the initial stages of development as we will see shortly). In other words, given that our self awareness and the intuitive attitude toward others are prelinguistic, then the connection between what we think and feel and how we manifest these inner states needs to be as well. This has an interesting implication for the way we understand the claim that we see minds in the behaviour of others, the claim that Wittgensteinians are eager to push forward. So, according to the attitudinal approach when we say that we see the mind in other people's behaviour, this 'seeing' of the mind is happening on the basic perceptual level. However, this process of direct 'seeing' does not come out from some semantic knowledge of the meaning of the words, as the proponents of the criterial approach would have it. This, of course, does not mean that we need to abandon the main Wittgenesteinian claim about the conceptual nature of the connection between the outer behaviour and the inner states. On the contrary, what we can argue instead is that the meanings of the mental concepts as well as the conceptual, internal relation between outer behaviour and inner life have their roots in something more basic and prelinguistic. So, the attitudinal approach seems to be built on a stronger claim than the one about the conceptual relation between inner and outer. The attitudinal approach is rooted in prelinguistic, not linguistic practices. Now, it is important to remind ourselves that these prelinguistic practices are a developmental prerequisite for normal language

development. The empirical evidence for this is abundant as we have seen in the previous sections. What this means then is that the conceptual relation between inner and outer, that Wittgenstein had in mind, *emerges* from prelinguistic practices that we are engaged in. In the next section I will say more about this.

When we pay closer attention to our everyday experience it seems that nothing is neither problematic nor suspicious about the main thesis of the attitudinal approach. When we witness someone falling down we are immediately aware that they are in pain (even though we cannot feel their pain). Moreover, we seem to be aware of their pain immediately in the same way we immediately feel our own pain (when we fall down and bump ourselves). In other words, there seems to be no in between steps of introspection or inference in any of these cases. This immediacy allows us to be certain about ourselves and others. As we have seen, according to the attitudinal approach, this certainty does not come in the form of justified belief or belief at all.

However, all of the above clarifications are still not good enough. We still need to answer one important question: what is this attitudinal approach exactly? In the following section I will examine whether we can clarify what this attitude is, what it involves, and what it implies. In order to do this I am going to revisit some findings and insights that we have received from the studies of autism.

c) The attitudinal approach and lessons from autism

Admittedly, some philosophers concerned with the issues of other minds and various Wittgensteinian positions will find the attitudinal approach described in the previous section counter intuitive. I have already mentioned the main reason for being wary of such an approach. That is, it seems fairly unproblematic that our knowledge of other minds does indeed involve all sorts of beliefs and that we have some good and some not so good reasons for holding such beliefs. To argue that our knowledge of others does not even come in the form of beliefs seems odd at best and wrong at worst. Even if we can make the case that there are some advantages to the attitudinal approach (that it can e.g. answer the skeptic better), such an approach still seems to be raising more questions than it promises to solve. So, if we are to defend the view that our knowledge of other minds does not come in the form of beliefs we need to explain our strong intuition that it does.

So, what is this attitude toward others after all? What is its nature? How are we to think about it? So far we have learned what this attitude *is not*: it is not a belief. We have also learned that it should be psychologically and epistemologically deeper than belief. What this means exactly has not been spelled out. Furthermore, it has been argued that such an attitude is supposed to allow us to have the immediacy of knowing that others are, for instance, in pain, without us having to do any inferences or derivations. However, as we have seen, the problem is that in many cases we are engaged in a reasoning process when trying to determine how people really feel and what they think.

That is, we are more than aware that we use all sorts of strategies and all kinds of evidence to reach the conclusion about their mental states. This kind of reasoning seems to suggest that our knowledge of others does indeed come in the form of belief. Now, the question is how are we going to go about these worries?

First, let us start with the assumption that this brief analysis of our everyday musings about other people's inner lives does not necessarily imply that we need to abandon the attitudinal approach altogether. But, if we are to hold on to it we have to specify more closely what exactly this attitudinal approach is. In addition, we need to explain why it seems that we do form beliefs about other people's minds and why we do search for evidence for these beliefs. In other words, what we need to do is to show how our everyday practices of forming and justifying beliefs emerge from our attitudinal, prelinguistic knowledge. For this purpose we will need to stop looking at and analysing our everyday practices. This is something philosophers like doing but such methodology can lead us only so far. What we need to do instead is to look at how such practices develop. More specifically, we need to go back to the most important insights related to development of social cognition and the possible causes of derailment of such cognition in children with autism.

As we have previously seen, the false belief test developed by Wimmer and Perner back in 1983 tells us that children are not able to attribute beliefs and desires correctly to other people before they are four years old. However, even before that, children do engage in social interaction and show a basic ability to interpret other peoples' intentions. This is particularly clear when they start participating in joint attentional scenes around nine months of age. By sharing attention with another person children exhibit understanding that the other person wants them to attend to a certain object or event. Moreover, prior to the

emergence of joint attention infants are able to read emotional expressions from their caregivers and participate in frequent emotional exchanges. In this early period they orient to social stimuli on a regular basis.

In the previous sections we have seen that individuals with autism have problems with all of the above. They do not read emotional expression well, fail to participate in joint attentional scenes, and attend to social stimuli far less than normally developing children do. All of this affects their language development and finally their ability to correctly attribute beliefs and desires to other people, i.e. to pass the false belief task.

These empirical findings point to a very interesting fact, namely that the child begins to understand emotional expressions and what they mean far before the child learns language. So, here is the first insight that might contribute to a better understanding of the Wittgensteinian attitudinal approach and how this approach could be related to the more standard criterial approach. As I have already briefly announced in the previous section, it seems that in the first year of a child's life we can find the foundation for what is going to become the conceptual link between inner mental life and outer behaviour. More specifically, empirical findings have shown that if the child is to engage in joint attentional scenes, the child needs to be able to decipher what it means when mom smiles or when she frowns. That is, the child needs to be able to read her facial expressions. This capacity enables the child to participate in joint attentional scenes which is, in turn, of crucial importance if the child is to learn language. Now, since language acquisition depends on this preverbal emotional communication (as empirical findings indicate), we cannot be that far off if we assume that the acquisition of mental concepts, i.e. the acquisition of the meanings of such concepts is in fact closely connected to these early, nonverbal exchanges.

But, what exactly does it mean to say that the early non-

verbal exchanges lay the foundation for the meanings of the mental concepts? Let me elaborate. As the child learns language, the child starts using mental concepts, such as "It hurts" or "I am happy", in order to express what she feels. Before she acquires language she relies on preverbal signals (only) to let others know how she feels. With language this changes and the child becomes able to express herself in words as well. Now, we have seen that in preverbal communication mom's smile is her happiness, while her frown is disapproval, for a child. This is what these expressions mean to a child and this is how the child reads them. As a result the child can respond to them appropriately before she learns language. From here we can conclude, (i.e. there are no strong reasons to think otherwise), that when the child learns mental concepts this internal connection between smile and joy, or frown and disapproval is kept. Wittgenstein believed this internal connection to be conceptual. We can now see that its origins lie in preverbal communication.

When children learn language they acquire all kinds of new habits and tendencies with it. The one important to our discussion here is the development of the child's ability to think about her own feelings and thoughts. So, with language, children develop the ability and the need to make sense of why we think and feel the way we do. This sort of meta-cognition is not only applicable to us but it also applies to others. So, by the time they are four, children start understanding what you need to perceive (see, witness) in order to form a particular belief. As a result they can pass the false belief test because they know that Max (who was outside the room) could not see that the chocolate was displaced.

Also, with language development, children become aware that people occasionally lie and pretend. Along with such awareness they start searching for the indicators that other people are (not) lying or pretending. In other words, they start to search for the evidence that their beliefs about other people's

mental states are correct. However, we need to keep in mind that such awareness comes much later when language and abstract capacities are fairly developed. It is also important to remember that these abilities grow out of immediacy of preverbal communication where possibility of lying and faking is yet to emerge. Wittgenstein, in his *Philosophical Investigations*, convincingly expressed a similar view: "249. Are we perhaps over-hasty in our assumption that the smile of an unweaned infant is not a pretence?—And on what experience is our assumption based? (Lying is a language-game that needs to be learned like any other one.)" (Wittgenstein, *Philosophical Investigations*, p. 90).

All of these insights are important as they help us understand two things: the developmental origins of the attitudinal approach as well as how we become able to question what other people feel, and wonder if they really feel what we think they do. However, as we have seen, this worry that others might pretend or lie does not emerge prior to language acquisition. Moreover, we are not worried about it in most of our encounters with other people. Even when we become suspicious that a friend or an acquaintance is lying to us, we deal with this particular case individually. That is to say, we do not question automatically that all people are lying all the time. In ordinary cases we can still tell how other people feel due to their vocal inflections or hear how they feel in their words. The ordinary cases are, in a sense, a normal background for thinking about others. As Hyslop correctly notices, to wonder if somebody is lying or pretending is not the same as doubting that they are persons at all.

Unfortunately or luckily, philosophers tend to radicalize and generalize these exceptional cases: namely, philosophers like to entertain their ability to imagine not only that all people are lying or pretending all the time but also that they do not have any feelings and thoughts whatsoever. In other words,

philosophers, particularly those who are into skepticism, usually engage in a thought experiment and construct a situation in which other people behave exactly the way we do but have no feelings or thoughts inside of them. Once philosophers radicalize the problem in this way, they start searching for some absolute and secure evidence for the existence of other minds. But, this is not a thought experiment typical for our everyday, intuitive attitude toward others nor is it a fair characterization of the way we usually think about them.

Let me try to explain what philosophers do by phrasing it in developmental terms. There is nothing problematic about the minds of others to a child before she learns language. As we have seen, these minds are present in the facial expressions of their caregivers and peers. However, once the child learns language she is equipped to ask all sorts of questions about other people including the very skeptical ones. But, we need to keep in mind that this very possibility tells us more about the nature of our language than about the nature of other minds. In other words, our language is such that it enables us to make all sorts of distinctions and abstractions no matter how arbitrary they are. We can and we usually do categorize things in many ways. We also change the rules of categorization as it suits us. Any arbitrary distinctions we make in language are very often useful to us in specific contexts. Sometimes we make them just for the fun of it. This is an extraordinary feature of our language. As such, language is a powerful tool for investigating nature. It also enables us to be flexible, adapt well, predict the future, and think about the past. All of this seems to have contributed to our survival.

However, it is important not to forget that language also allows us to make distinctions such as the one between the inner mental life and the outer behaviour. This one seems to be made up rather than really present in our social practices. Not to mention that it turns out to be more damaging and misleading than

useful. What this means is that when we take a look at a child's development, the first thing we notice is that there is no trace of such a distinction in our developmental trajectory. On the contrary, everything that the child does before she learns language and long after she learns language goes against the assumption that such a distinction makes sense at all. Indeed, it is a fact that we can make it, but we can make all sorts of distinctions that belong to a fantasy world and this one seems to be of that kind.

d) The attitudinal approach vs. Theory-Theory and simulation theory: revisited

Indeed, none of the aforementioned empirical findings about development of our social cognition have been questioned by the Theory-theorists or simulation theorists. They do acknowledge that children develop many other capacities before they can pass the false belief test. So, the question is how they can incorporate such findings into the Cartesian framework they work with. So, Baron-Cohen and those who favor the theory of mind module hypothesis tend to see the development in the first four years of child's life as the process of maturation of the theory of mind module. Those sympathetic to the simulation hypothesis argue that some sort of simulation is present from birth. They argue that infants' ability to recognize emotional expressions and achieve affective attunement between herself and a caregiver comes from this innate capacity of simulation.

So, it seems that the empirical research on the development of social cognition and the findings that we gathered from autism research do not support the Wittgensteinian attitudinal approach to mind in some straightforward way. So far I have shown that the attitudinal approach is in accord and can go well with such findings. I have also shown how empirical developmental research can cast more light on some Wittgesnteinian clams: such as the one that the relation between inner mental states and our behaviour is conceptual, not causal. That is, developmental research can tell us where such a conceptual link originates. However, the question lingers: why should we

accept the Wittgensteinian, attitudinal approach over the Cartesian Theory-theory approach or the simulation theory approach?

Let us first deal with the Simulation theory and its main weakness. As we have seen in the chapter three, there is one particular set of findings (Baron-Cohen 1989; Hurlbert *et al*.1994) that present a problem to the simulation theorists. These findings indicate that the emergence of social cognition goes hand in hand with the emergence of the mind, i.e. the emergence of our inner mental life and self consciousness. That is, this research has shown that children with autism are doing poorly when asked to describe particular mental states not only when it comes others but also in their own case. As Carruthers (1996) put it, children and individuals with autism do not only have impaired ability to ascribe beliefs and desires to others but also lack the ability to ascribe beliefs and desires to themselves. This means that their mind-blindness goes hand in hand with their lack of self knowledge. Now, as we have seen, this is a problem for simulation theorists because their position implies that we get to know our minds first and later apply this knowledge to others. That is, according to them, our mind serves as the model for other minds. Their theory would then predict that children with autism could have regular self-understanding but due to the impaired simulation mechanism they would have impaired understanding of other people. However, the aforementioned findings indicate that this is not the case.

Findings that our self-knowledge comes together with the knowledge of others seem to go well with the attitudinal approach. Given that all that the child knows emerges from social interaction between a child and a caregiver, it seems highly probable that the way the child understands herself (its agency, inner feelings and the like) gets refined through such interaction too. So, according to the attitudinal approach, our self-awareness and our attitude toward others need to shape each other.

It is hard to see how we would be able to identify our own feelings and thoughts without individuating and identifying them in our caregivers and peers. This, in turn, is not possible unless we can connect with them in early social exchanges due to proper functioning of our physiological apparatus (intersensory perception and integration).

However, these findings can also go well with Carruthers' version of the Theory-theory approach. That is, the theory of mind module approach allows you to argue that in the first years of child's life the module is in the process of maturation. During maturation of the module, development of self knowledge and knowledge of others happens simultaneously: hence, the aforementioned findings according to which those who lack the knowledge of others seem to lack the knowledge of the self. After all, if we remind ourselves, such theory of mind module is nothing but a theory of how the human mind works, whether it is our own mind or the mind of others. So, as such a theory matures, it broadens our knowledge of others as well as our self-awareness. In this way we can say that some Theory-theorists are departing from one of the key elements of the Cartesian position, namely that there is an asymmetry in the way we know ourselves and the way we know other people. However, they remain Cartesian in an important sense as they argue that the self is nonetheless isolated and constructs a theory to make sense of other people's behaviour. Such a theory then is justified and improved in the ongoing interactions with other people.

Now, let us examine if there are some good reasons to opt for the attitudinal approach (and along with it abandon the Cartesian take on mind) over the Theory of mind module approach. In the previous chapter we have mentioned some interesting findings that show how children with autism tend to solve the false belief tasks (Happe, 1997). Unlike normally developing children they are actually able to report all the steps that

they went through before reaching the conclusion. Normally developing children are not able to make similar reports. This suggests that the strategy that normally developing children use is somewhat intuitive whereas individuals with autism are relying on learned, rule-based strategy. Even though further empirical research is required to cast more light on the exact rules they use, we can make some tentative conclusions from what we have now. It seems that children with autism rely on something akin to theoretical reasoning when inferring what other people think; but without underlying intuitive knowledge, such inferring is done through hard work and does not come naturally to these children. Ironically, it is not the theory of mind that they lack. On the contrary, the theory of mind (provided that they manage to learn it) is the only tool they have when faced with other people, their thoughts and emotions. What they seem to lack is the right attitude toward other people that would allow them to intuitively know how things stand with these others.

Finally, when deciding between two theories there is always the question of simplicity. Indeed, simplicity does not have to be crucial. As we all know, the simpler theory is not always the better one. Nevertheless the criteria of simplicity should be taken into account. Even if, at the end of the day, we opt for the more complex theory, we should be able to cite some reasons for our choice. So, when comparing the Cartesian Theory of mind module (at least the Carruthers' version of it) and the Wittgensteinian attitudinal approach, we can see that both predict the co-emergence of self knowledge and knowledge of others in development. But, unlike the attitudinal approach, the theory of mind module approach maintains that some hidden, complex, cognitive mechanism coded in genes is growing and maturing in these first years of child's life. When it reaches the final stage (around child's fourth birthday) it can be used for explaining and predicating other people's behaviour.

However, to postulate such a hidden mechanism seems redundant if we could explain the development of social cognition and many of our social abilities from simpler neurophysiological processes and basic mother-child interaction as we have tried in the previous section. Now, if we follow the attitudinal approach, we can say that our intuition about others, i.e. our inherently social attitude toward them, emerges from social interaction between a child and a parent as well as affective attunement, social orienting, and joint attention. As we have seen, all of the above are necessary if the child is to learn language. With language, the child starts learning a variety of concepts including mental concepts such as joy, pain, guilt, and the like. Finally, language acquisition allows the child to learn concepts such as beliefs and desires. In this way the child acquires the necessary tools for theorizing about others. The child becomes able to think about other people's beliefs and question them. In a nutshell, the child becomes able to predict and explain what other people do based on the kind of beliefs and desires they have. However, the acquisition of these tools is not written in some genetic program but is likely to be a side effect of language development. But, it is worth remembering that language development emerges from prelinguistic communication of emotions and intentions. In such communication the right intuitive attitude toward others develops too. The attitude is nothing more but an intuition that other people are live human beings with inner mental lives. Without it, it is hard to learn language, and understanding others becomes hard labour. What this means is that the right attitude toward others (the Wittgensteinian one) precedes the theory of mind. Moreover, it lays down the crucial developmental steps for its emergence at the age of four.

e) Moving away from Cartesianism

In chapter two, I have mentioned some of the new developments in cognitive science and psychology, developments that indicate the departure from the standard cognitivist approaches to the mind. The critique of the Cartesian representational theory of mind seemed to be one of the common themes in many of them. They criticize the main Cartesian presuppositions about the mind: the assumed asymmetry between our self-knowledge and knowledge of others, the concept of an isolated mind that forms representations of the external world, and the Cartesian bifurcation between affects and cognition. As we have seen, all of these assumptions characterize traditional cognitivist approaches to the mind. Now, many of these new emerging positions are inspired by phenomenology or new developments in other sciences such as developmental biology, neurology, primatology, and others. In these new trends, the mind is no longer confined to our brains nor is it isolated from the social world. The mind has become embodied, extended, and deeply social. So, in a sense what we have been witnessing in the last two decades or so is yet another cognitive revolution. This time it is the revolution against computationalism, cognitivism, representationalism and cartesianism in its many forms.

After closer inspection of the Wittgensteinian attitudinal approach and the case of autism there are several important points left to be made. Firstly, it seems that empirical findings are telling us that the mind with its capacities is essentially social and that there is no asymmetry between the way we know

other people's minds and ourselves. That is, our knowledge of others as well as our knowledge of ourselves emerge from social interaction. The best way to think of such knowledge is in terms of intuition or attitude rather than in terms of theory and propositional attitudes as Cartesians would have us believe. Secondly, these findings also show that it would be misleading to divorce cognition from affects as the attitude toward others as well as our self-awareness are closely connected to the affective atunement and reading of emotional expressions. In this way our first knowledge of others and the world comes in the form of emotions that shape emotional understanding and eventually lead to successful language acquisition and development of abstract reasoning.

Now, this has important implications for the representational theory of mind. It seems that our mind is not an isolated entity that makes sense of the world through the representations it forms, or at least not from the very beginning. The ability to form representations comes with language in the later stages of development which means that our representations as well as our mind have roots in our social interactions. In this sense the Wittgensteinian attitudinal approach, along with the studies in autism do not necessarily lead us into more radical positions that claim that our minds are through and through non-representational. They do tell us that the beginnings of our mind are non-representational but allow for representational capacities of our mind to develop later. There are indeed non-representational approaches to the mind that rule out representations altogether such as a variety of dynamic systems approaches to the mind (for a review see A. Clark, 2001). There is also a variety of problems with such approaches, the most obvious one being that we indeed seem to be able to form representations and meta-representations in our minds. So, the onus would be on such approaches to explain away all that looks like 'having an idea' or forming representations in our everyday experience.

But, the Wittgensteinian attitudinal approach does not have to be seen as belonging to these rather radical positions. The only important point the Wittgensteininan approach tells us is that the minds as well as its representations, are essentially social. This means that our minds are not busy constructing implicit (hidden) theories from the very beginning but rather that we become able to engage in such activities through social interaction with our caregivers. In other words, through such interaction we become self-aware and learn how to think about the world and others. That is, we learn how to engage in many social practices including linguistic practices and abstract reasoning.

Of course, it would be hard to reach all of these insights about the nature of our minds without taking a developmental approach. In this sense, the studies of autism have been invaluable. So, the naturalized Wittgensteininan approach that I have advocated could not have been even formulated in this way without a strong footing in empirical developmental science.

To conclude, in the light of the aforementioned new cognitive revolution, this book is meant to play a small part in it. Even though I have not surveyed all the different new non-Cartesian trends and positioned the Wittgensteinian one among them, I hope that I have at least shown that the naturalized non-Cartesian take on mind could come and be inspired by the Wittgensteinian tradition; a tradition that has been more or less ignored so far. Indeed, there are authors such as Alva Noe (2010) or Stuart Shanker (1998) who are not reluctant to mention Wittgenstein as one of the key figures in the development of their philosophies. Nonetheless, this has not been a widespread phenomenon and many psychologists and cognitive scientists remain skeptical about the ways in which Wittgenstein's take on the mind could help us in our scientific endeavors. I hope that this book can convince at least some of them in the opposite direction. Its main goal was to show that the

Wittgensteinian attitudinal approach to other minds provides a better understanding than its Cartesian counterparts of potential deficits of social cognition in developmental disorders such as autism. As such, its goal was fairly modest but I do believe that it could go a long way and help us devise better strategies for understanding what our minds are and what makes us human.

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CIP - Каталогизација у публикацији - Народна библиотека Србије, Београд

159.9:165
616.89-008.48:165

RADENOVIĆ, Ljiljana, 1972-
The Curious Case of Other Minds : philosophical and psychological approaches to social cognition and theories of autism / Ljiljana Radenović. - Beograd : Institut za filozofiju, Filozofski fakultet Univerziteta, 2015 (Beograd : Institut za filozofiju). - 196 str. ; 24 cm

"Ova knjiga nastala je u okviru projekta 'Dinamički sistemi u prirodi i društvu: filozofski i empirijski aspekti' (evidencioni broj 179041), koji finansira Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije" --> prelim. str. - Tiraž 100. - Napomene i bibliografske reference uz teskt. - Bibliografija: str. 180-196.

ISBN 978-86-88803-97-7

a) Слика другог - Епистемолошки аспект b) Аутизам - Филозофски аспект
c) Филозофска психологија
COBISS.SR-ID 214648332

Institut za filozofiju
Univerzitet u Beogradu
Filozofski fakultet