Social learning and the etiology of autism

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Abstract

A developmental theory of autism is presented as an alternative to current nativist theories. The traits of autism are seen as results of failure of the process of social learning. The distinction between social learning and ontogenic discovery is discussed and a model of normal social learning is presented, showing its cyclical nature and significance. Recognized traits of autism are briefly described and classified, and it is shown how the main categories of traits could result from defective social learning, while defective social learning itself could be the result of a variety of causes, some of which might also affect other aspects of intelligence. The theory provides a framework into which current knowledge of autism can be integrated.

Keywords: Autism; Cognition; Development; Learning; Language; Theory of mind

1. Introduction

The cause of autism can be sought on several different levels. Since autism has been found to involve a hereditary element, chromosomal structures can be sought that are correlated with it, implying that they cause or produce a predisposition for autism. On the physiological level, abnormalities can also be sought, whether involving brain structure or neurochemistry. Extensive bibliography and review of genetic and physiological research can be found in Dawson and Lewy (1989b), Ornitz (1989), Bailey, Phillips and Rutter (1996) and Mesibov (1998). Neither of these approaches, however, addresses the dynamics of autism itself. How does the autistic mind develop and how are the various traits of autism related to one another? These are important questions practically as well as theoretically, since understanding the course of
development of the autistic mind helps guide therapy. Even were genetic and physiological research to provide definitive explanations, their contributions to our understanding would be limited. The anatomy of the pianist’s hands tells little about his technique, and less about the structure of a fugue or sonata.

On this third level, there are currently two general approaches. One is that the primary problem is cognitive, involving the lack, partial or total, of the ability to perform a particular sort of cognitive operation. The other is that it is conative or affective, involving the lack of normal emotional responses. The first is by far the more widely accepted. There are several major cognitive theories. Leslie, Baron-Cohen and others maintain that normal human beings possess an innate mechanism that enables them to know that other humans have inner mental activity, including such things as thoughts, desires, feelings and emotions. This is referred to by the general term “theory of mind”. They claim, furthermore, that anyone lacking this innate mechanism is essentially unable to form the concept of an intentional being, neither by experience nor by reasoning. Autism is the condition that results from this lack (Leslie, 1987; Leslie & Frith, 1990; Leslie & Roth, 1993; Baron-Cohen, 1995).

In the model of Leslie (Leslie, 1987; Leslie & Roth, 1993) and Baron-Cohen (1995), the specific defect is in the ability to see thoughts as distinct from reality, which Leslie dubs “decoupling”. The normal child, observing a person looking at a tree, knows that the person is not only looking, but doing something else, something inobservable, which the child eventually learns to call “thinking”. The autistic child, lacking this innate ability, is essentially unable to develop this concept. To him the statement “The person is thinking about the tree” is just another way of saying “The person is looking at the tree”. He therefore cannot conceive of someone being mistaken, that is, having a false belief, a thought that is not a reflection of reality. Farther yet from his grasp are the concepts of deception and pretence, which require the more complex concept of a thought whose subject is itself a thought rather than an observable event.

Searching for an even more elementary mechanism, Baron-Cohen (1995) hypothesized an innate ability to recognize shared attention. In normal children, this seems to emerge during the first two years of life, beginning with following the line of sight of others and briefly attending to the object of their attention. This behavior is followed by the emergence of the pointing gesture to draw the other’s gaze to the object of the child’s own attention. Baron-Cohen interprets this as indicative of awareness not only of the overt actions of others, but also of mental states such as intention, thought and desire that the infant innately believes underlie these actions. This pattern of behavior tends to be absent in autistic children, so he concludes that autistic children lack the normal innate awareness of thoughts.

A second current cognitive theory places the deficit in a broad class of cognitive skills referred to as “executive function”, which are involved in planning and in attaining goals, especially when it is necessary to disengage from immediate context or avoid distraction in order to guide behavior by reference to mental models (Hughes & Russell, 1993; Hughes, Russell & Robbins, 1994; Hughes, 1996; Ozonoff & Strayer, 1997). Another theory is that autistic children lack the ability to integrate individual sensations into a coherent whole and to put individual experiences into context. They attend to parts and details, while failing to grasp the bigger picture (Frith, 1989).
Though these areas of reasoning are not directly related to social behavior, it is claimed that their affects are felt most strongly there.

Yet another cognitive theory is that the primary deficit is in symbolizing, specifically, in the formation and coordination of self-other representations. This low-level cognitive deficit manifests itself in impaired imitation, emotion sharing, and mentalizing. In particular, failure to imitate during early stages of development results in defective development of fundamental aspects of social behavior, in particular, those involving a sense of identity with other human beings. Without these fundamental elements, further social development, which is more complex, cannot proceed normally, so the lack of this simple childhood ability indirectly affects all subsequent development (Rogers & Pennington, 1991).

In contrast to these, the current affective theory is that autism is the result of the lack of a normal innate ability to interpret expressions of emotion, and therefore to perceive emotion in others, or to express emotion effectively (Hobson, 1989, 1990; Hertzig, Snow, & Sherman, 1989).

But, while each of these theories offers plausible explanations for certain aspects of autism, there are other aspects, some major, that each fails to explain. A satisfactory theory should explain all aspects of the syndrome, not just a select few. It is, therefore, necessary to be familiar with the range of traits associated with autism, and to evaluate each theory with respect to all of them.

Autism is a disorder of childhood development. Symptoms are evident by about 3 years at the latest. Most traits of autism fall into three general categories (Wing & Gould, 1979; Wing & Attwood, 1987; Schopler & Mesibov, 1988; Frith, 1989; World Health Organization, 1992; American Psychiatric Association, 1994; Happé, 1994; Harris, 1995; Bailey et al., 1996).

1.1. Impaired social interaction

In severe cases there is no social contact at all. Humans are ignored or treated as objects. Milder cases are characterized by lack of normal interest in people, lack of participation in social reciprocity such as greeting behavior, failure to form normal peer relationships and to develop normal social behavior in childhood, going on to abnormal social relationships in later life. Overall, the autistic individual gives the impression of being in a world apart from other people.

1.2. Delayed or abnormal communication and language development

Lower functioning individuals may be complete mute or have only minimal speech with little or no communicative function, such as echolalia or rote recitations. In higher functioning individuals, language use tends to be idiosyncratic, and there is difficulty in participating in conversation. Nonverbal communication, such as eye contact, pointing, and use of facial expressions and intonation, also tends to be deficient. Language tends to remain concrete and literal, and there is difficulty in understanding prosody and more subtle abstract and context-dependent expressions even when general-language level is normal or above.
1.3. **Insistence upon regularity and adherence to repetitive patterns of behavior**

It is typical, especially for younger, lower functioning children, to perform apparently useless motor mannerisms, such as spinning and hand flapping, often repeatedly and compulsively. Among older, and higher functioning individuals, this is less prevalent and less obvious, but there is instead inflexible adherence to apparently nonfunctional rituals, and resistance, sometimes violent, to changes of schedule or surroundings. Interests tend to be limited and sometimes intense to the exclusion of all else. There is a tendency to perseverate, and refuse to be relinquish current activity.

Broad population studies have found that the presence of social abnormalities of the type characteristic of autism almost always is accompanied by abnormalities of the second two categories, but that the reverse is not necessarily true.

There is also a strong correlation between autism and mental handicap. Neither one, however, necessarily implies the other. Most mentally handicapped individuals are not autistic, and a significant minority of autistic individuals have normal or above normal intelligence, including some whose autistic characteristics are severe. An acceptable theory must account for both tendency and nonnecessity of mental handicap. Indeed, it is this pattern of tendency and nonnecessity that characterizes many aspects of autism. Specific abnormalities such as failure to make eye contact or attraction to spinning objects are found in a significant portion of the autistic population, but are not universal. A satisfactory theory must explain why autism tends to involve these traits, but also allow for their absence.

The “theory of mind” theory offers plausible explanations for social and language deficits, but is of little help in understanding insistence upon regularity. However, even if a satisfactory explanation of this trait were found, this theory would still suffer from the devastating flaw that lack of theory of mind abilities is not universal in autism. Not all autistic individuals fail theory of mind tests. As the experiments of Baron-Cohen (1995) and others (Prior, Eisenmajer, Leekam, Wing, Gould, Ong & Dowe, 1998) have demonstrated, there is a “talented minority” that pass. Some even pass the more difficult “second-order” tests, in which it is necessary to grasp the concept of one person thinking about the thoughts of another (Prior et al., 1998). These individuals clearly understand that human beings have thoughts and emotions. The ability of some to understand and even practice deception shows that they also understand that thoughts are distinct from reality. They have a “theory of mind”, yet in other ways they are typically autistic. Even if this minority were very small, its existence would prove that autism can exist even in the presence of a theory of mind. But this minority is in fact quite large, above 20% in BCs own experiments, and even greater in other studies (Prior et al., 1998) including the majority of those with otherwise normal intelligence. Since lack of theory of mind cannot be the cause of autism in these individuals, its lack in lower functioning individuals may be better explained as a result rather than a cause of the other traits (Hughes & Russell, 1993).

Lack of ability to imitate, too, is not universal. Most autistic children can perform a certain amount of imitation, and the abilities of some are within or above the normal range. While it is understandable that severe impairment of imitation would result in radically abnormal behavioral development, in cases where impairment is mild and
restricted to specific forms of imitation, it is hard to see why resulting abnormalities would be so severe. Traits involving insistence upon regularity also present a problem for this theory. Such a deficit, like deficits in theory of mind, fails to provide a plausible explanation for this important category.

Executive function and central coherence theories suffer from a different problem. While they are supported by their high correlation with autism as diagnosed by accepted criteria, (Hughes & Russell, 1993; Hughes, Russell & Robbins, 1994; Ozonoff & Strayer, 1997) they are unable to provide satisfactory explanations for some of the central traits, especially those involving social development. Indeed, since the main definition of autism is in terms of abnormal social relationships, and these are, by definition, always involved, it seems likely that the cause itself is somehow social. To postulate a root cause that is not in itself social immediately raises the question of why it manifests itself primarily in the social sphere and may spare other areas of development. If the cause is not itself social, social behavior must at least follow from it in a sufficiently direct way as to be an unavoidable consequence, while other defects must be permitted the possibility to range toward normal levels.

Aside from these criticisms, it is to be noted that all these theories are based upon the assumption that the cause of autism is the lack of a particular fundamental ability. While it is well established that the cause is biological rather than environmental, as was believed by proponents of the psychogenic theories of the early decades of autism research, that biological cause need not be the lack of an ability. Not all hereditary characteristics involve abilities. Physical characteristics like height and hair color are not abilities. Similarly, psychological characteristics include likes and dislikes, levels of tolerance, and tendencies to certain kinds of behavior. Indeed, some theories of autism already include such elements. Frith’s theory of lack of central coherence, for instance, involves not only the ability to put experience into a larger context, but also the drive to do so to the extent that that ability is present (Frith, 1989). Since autism is a developmental syndrome, the search is for the innate characteristic that causes development to proceed in this abnormal way. That innate characteristic need not be an ability.

The search for a primary cause is further complicated by the ambiguity of causal relationships between the various factors. Many could conceivably be causes of others, but might just as well be results, making it difficult to determine which are primary (Bailey et al., 1996). Thus, cold and distant treatment of some autistic children by their caregivers led early observers to believe that this was the cause of their abnormal behavior, but later research indicated that it was rather the innately produced aloof behavior of the child that discouraged caregivers’ attempts at interaction (Cantwell, Baker & Rutter, 1978; Volkmar & Klin, 1993).

2. The social learning cycle

Let us approach the problem from a different direction. Rather than beginning by looking for the root deficit, let us try to identify the affected mental processes and understand how they function in the normal individual. This question is implicit in
Every theory of autism. Each assumes both a theory of the normal mind and an identification of which specific functions of the mind are involved in the disorder. To make such an identification without addressing the question explicitly is tantamount to starting with a partial assumption of what the answer to the question of autism itself is. It is, therefore, imperative that we begin with these questions.

The first question then becomes, by what mechanism do normal individuals develop social behavior and acquire language? That is, how do they achieve those things in which autistic individuals are most markedly deficient? And, would malfunction of such a mechanism also lead to the other traits of autism, such as repetitive behaviors and insistence on regularity? These are clearly not abilities that are present at birth. In the normal individual they follow a slow, more or less regular, course of development, and since that course always involves experience and generally training, it seems to be a process of learning.

Classically, cognition is considered to be derived from three sources: innate knowledge, experience, and reasoning (Piaget, 1967). There is, however, an important fourth source that is often omitted. That is social learning (Jolly, 1966; Bandura, 1971, 1989). Although society is a part of the environment, the way in which knowledge is derived from it is essentially different. In social learning, the individual learns from his conspecifics, not about them. He acquires the knowledge, skills and behavior patterns of the group or elder conspecific, his own becoming a copy of theirs. He does not discover or develop them himself. This acquisition may be via training, either intentional or unintentional, or by other means such as imitation. Social learning is found to a limited extent among many species of mammals and birds, but in primates the portion of cognition that is socially derived increases significantly, and is greatest in man.

There seem to be several unique innate mechanisms essential for social learning, among them tendencies to respond in more or less predetermined ways to actions of conspecifics, and to imitate, sometimes in response and sometimes spontaneously. On the other hand, there are certain basic cognitive mechanisms that are not needed for social learning. It does not require reasoning processes such as generalization, induction, deduction and analogy. Of course, once socially acquired knowledge enters into the general body of knowledge of an individual, it is worked upon by all these too, but they are not central to the initial acquisition.

Since it is in the area of social skills and socially acquired cognition, including language, that the autistic individual is deficient, in sharp contrast to that which is individually derived, whether by interaction with the environment or by reasoning, the process of social learning seems a good candidate for the site of the root of autism. Whatever that process is, the autistic individual seems to be deficient in it (Rogers & Pennington, 1991).

Social learning begins almost at birth. As the infant touches his mother’s breast, looks in her eyes, hears her voice, he begins to become familiar with the sounds, smells and rhythms of his culture. Even during the first year, while the infant is ontogenically developing fundamental knowledge of his own body and environment, he is at the same time being trained in social patterns as in the interchange of gazing and looking away, cooing and responding, grasping and releasing (Kaye, 1977, 1979). But the
amount to be learned about the physical world is so overwhelmingly large that during the first year it must necessarily form the greater part. It is therefore in the second year that social learning begins to contribute an increasing portion of cognitive development, both through teaching by caregivers and through spontaneous imitation. The fact that it is during this period that the signs of autism are generally first noticed is further indication that it is in the social learning process that the autistic child is deficient.

Like all learning, social learning is cumulative. Just as the skills of arithmetic enable one to learn algebra and the skills of algebra enable him to learn calculus, so too, the elementary social skills of the infant enable him to acquire the more advanced ones of the toddler, of the preschooler and so on.

Society is very complex, and learning to participate in it requires years of training and practice. The average 10 year old already knows how to eat with knife and fork, shop for groceries and carry on a conversation, but he has not yet become an acceptable dinner guest, cannot yet evaluate whether a purchase is worthwhile, and does not know what comments are appropriate in a particular social situation and which should be avoided. The differences between cultures, increasing with the complexity of the situation involved, indicate a cumulative process of learning in which each individual is trained, beginning with infancy, to become a participant in the culture of the social group in which he is raised (Harré, 1993).

But this is not simply a process of accumulation, piling one upon the other. The elementary skills form not only the foundation upon which the next level rests, but the very bricks of which it is built. It is thus a multiplicative process, not an additive one. Furthermore, not only are new skills acquired at each stage, but perception and thought are molded, enabling the learner to perceive and understand experience in a way that makes construction of the next stage possible. Sensations and experiences that were previously meaningless become significant. Until they are, it is impossible for him even to attend to them, for to him they do not exist. He does not notice them, so he cannot become interested in them. For example, until a child learns multiplication and division, prime numbers can have no significance for him. He cannot even conceive of a rational number, and certainly not an irrational one. But once he learns these operations he can look at the numbers and say, “Look! These are even, these are odd, these are perfect squares, these are prime!” So too in the course of language acquisition, only after the infant has become familiar with certain sounds that his caregivers make can he begin to attend to them and distinguish one from the other. And only after that can he notice that those different sounds are associated with various actions and objects.

In ways similar to those presented by Piaget (1967), the learning process can therefore be seen as a cycle. Not only does learning influence behavior, but behavior influences the course that future learning will take. Learning leads to recognition which leads to interest, to attention, and these lead to further learning. This cyclical nature is common to social and other learning, but in one aspect, social learning is exceptional. In learning cycles, in general, the step from recognition to interest and attention often fails for lack of sufficient motivation. In social learning, however, progress is rewarded because social competence is beneficial and participation in
social activity itself is experienced as enjoyable. This double reward of direct and immediate pleasure together with long-term practical benefit produces powerful reinforcement. Social acts, once performed, are repeated for the sake of the pleasure they bring, so that they are preserved and become well established. Thus, the new kinds of perception that they make possible become more salient and interesting, paving the way for the next step. Ultimately, it is the cycle itself that is reinforced and strengthened by the firm establishment of the achievement of each level produced by the rewards of the new skills attained therein.

So, in addition to the cyclical nature shared with other learning processes, the social learning process has the property of positive feedback that continually propels it forward, giving it strength and momentum. If the learning of mathematics were reinforced as much as social learning is, that is, if mathematical skills were found valuable and pleasurable in everyday life and were therefore continually practiced, students of mathematics would progress much more rapidly. By virtue of its cyclical nature and self-propelling property, the social learning cycle can be considered an organic unit, a conceptual or ‘virtual’ organ.

However, while when intact it is very powerful, the many steps upon which it is dependent render it vulnerable to disruption. Complete failure of a single step would bring it to a halt. Minor malfunction might cause only partial disruption as long as the force of the rest of the cycle was sufficient to push it through that step and keep it going. For example, if an individual completely lacked the tendency to imitate, certain kinds of learning, both social and general, would never take place. If that tendency were present but weak the process would continue, perhaps at a rate below normal, as long as enough opportunity for imitation were provided. The combination of several minor malfunctions, however, might interrupt the cycle even if no single one failed completely.

Since the social learning cycle is so essential for human survival, all the necessary elements are present in the normal individual at levels more than sufficient for proper functioning. A certain degree of defectiveness can therefore be tolerated without disrupting it. The vast majority of children therefore acquire all the skills and cognitive norms of their cultures as they develop psychologically and mentally. It is only when one or more elements are severely impaired that the normal cyclical progress fails.

If it can be shown that the various traits of autism can be explained as results of subnormal functioning of this cycle, then it will be reasonable to conclude that the syndrome that we know as autism is the manifestation of defective social learning. This is consonant with the conclusion of Frith (1989), Happé (1995) and others that the underlying cause of autism varies from one individual to another. They refer to this as a “final common pathway” (Frith, 1989). The social learning cycle is an alternate hypothesis of what that common pathway is. Since anything that disrupts the cycle might result in autism, the underlying cause might not be the same in every individual. In some it might be failure of a single mechanism, in others the combination of subnormal functioning of several. This would also explain the wide variation within autism itself, from mild to severe, and from autism accompanied by mental retardation to that in which intelligence is normal, reflecting how and to what extent the cycle has been disrupted.
3. The relationship between social learning and other sources of cognition

Before discussing the connection between the social learning cycle and the various traits of autism, let us consider the relationship between social learning and the other sources of cognition. There are clearly many things, of which language is a prime example, that cannot be learned any way but socially. But the fact that other things could be learned ontogenically does not mean that in practice they always are. Consider recognition of danger. Unless a species produced a very large number of offspring, learning what to avoid from experience of close escape from danger would not be sufficient to preserve the species, since for every one that survived a close escape there would be many more that were not as lucky. Even learning vicariously by observing the experience of a conspecific would be costly for the species, since most of these “lessons” would involve a fatality (Bandura, 1971).

There are three alternatives. On the one extreme, each individual could be provided with an innate fear of those dangers it is likely to encounter. On the other, the individual could have reasoning mechanisms that enable it to discover what is likely to be dangerous without ever actually experiencing it. The limitations of these two are obvious. The first offers protection from only a predefined set of dangers and fails for new ones. The second is limited to the very highest species. Even in man, it is often too slow to warn an individual until too late. The solution to this problem is the third alternative, social learning. If a population is able to teach its young what to fear, then the experience of a few, whether direct or vicarious, becomes sufficient to protect the rest (Bandura, 1971). The existence of just such a mechanism has been studied in various species of primates (Jolly, 1966).

The potential source of a particular type of cognition need not, therefore, be limited to a single one of these three sources. It may be possible to derive it from more than one of them. Furthermore, in some species certain cognitions may in fact have multiple co-sources. This redundancy is neither inefficient nor undesirable. In the case of essential cognitions such as fear of danger, it is highly adaptive, because existence of more than one is a greater guarantee that the cognition will be acquired. The benefits of the extra mechanism are well worth the burden. Nor is it unreasonable that such separate mechanisms would develop, because the same forces motivate them all to solve the problem, that is, to adapt to the environment.

This confluence is not restricted to cognition alone, but characteristic of behavior in general. The more essential the behavior, the more mechanisms it will tend to be addressed by. Such is the case of nourishment. The infant has an innate sucking reflex. After a while he learns that the taste of food is pleasant and that ingesting relieves the pain of hunger. The adult also learns to eat to keep himself healthy, sometimes even without hunger being felt. Finally, culture addresses the problem by developing such institutions as regular meals. Thus, the need for nourishment is addressed by innate reflex, by learning, by reasoning, and by culture.
4. Implications of impaired social learning

If the social learning cycle is impaired for any reason, it is those areas of behavior and cognition that are most dependent upon social learning that will suffer the most. Those also addressed innately or by ontogenic discovery and reasoning will be less affected. The effects of such malfunction are compounded as time goes on. If a child fails to learn the simpler behaviors of others, the more complex ones will remain completely beyond his reach. For autistic individuals who have not yet learned to understand human behavior on some basic level, more complex behavior is too baffling to even be attempted. It is either overwhelming in its complexity or apparently chaotic. When even the elements are not recognized, there is nothing of which to compose forms, nothing of which to make sense.

For the normal child, the more he understands human beings the more interesting they become to him and the greater is the portion of his attention that will be directed toward them in preference to the rest of his environment. Not so the autistic child. As he gains greater understanding of the physical world, his understanding of the special world of humans fails to keep pace, so he tends to pay more attention to inanimate objects and learn more about them. Although humans are part of the physical world, their behavior is much more complex than that of inanimate objects, so they end up not only equally interesting, but, in fact, less so. And as the cycle gains momentum in the normal child, the autistic child falls further and further behind.

Even for the high-functioning autistic adult who has managed, by reasoning, training, or other means, to acquire a normal range of social skills, social learning always remains an uphill struggle, because it is the social learning mechanism itself that is impaired. The acquisition of each social skill requires greater effort than it does for the normal individual, and, though he thereby achieves a new level, the same problem presents itself there again in proceeding to the next one. It is as if he is unable to use the elevator and must keep taking the stairs. We will see this shortly with respect to language. First, there is the hurdle of learning language, but even after it is acquired, there is the hurdle of using it in context, using it figuratively, and of knowing when it is being used in which way.

Nor does social learning end in childhood. It is an ongoing process. The mature adult is never a finished product, never a totally independent being whose behavior proceeds entirely as determined by that early molding, resistant to further influence. The normal individual is continually learning socially throughout his life, being influenced and modified by society. His behavior is determined not only by his internal personality but by the collective personality of the group, which is itself continually developing and changing in response to new situations. The direction that it takes might be radically different from that which a particular individual might have taken, left to his own devices. But it is ultimately that direction that most members end up taking, not the one they would have on their own. By doing so, their own personalities are also changed for the future.

In light of that, it can be seen why autism continues to be a handicap throughout life, even for those who have mastered the language and basic social skills that were so blatantly lacking or flawed in childhood. The specific traits change as the individual
develops, but the underlying autistic nature remains (Wing & Gould, 1979; Frith, 1989).

In addition to being a source of cognitive and behavioral development, the social learning cycle also serves as a regulator. It tells which things are important and should be learned and which are unimportant and should be ignored. Without this social guidance, development may go off in any strange direction. An individual may find a particular thing interesting for purely personal reasons. He concentrates on it and develops unusually great skills and knowledge. If it is something that the culture in which he lives does not deem important, his interest and achievements are considered strange. If, at the same time, he fails to pursue the socially prescribed interests, he seems stranger yet. Of course, social learning is not the only regulator. The physical environment is too, so development is not arbitrary even if the social learning cycle does not function. Those aspects of the environment that are necessary for survival must eventually attract his attention if he is to survive. But practical restrictions are fewer than social ones.

5. Common sense

Among the characteristics of autism that persist into adulthood even in otherwise intelligent autistic adults is lack of common sense (Frith, 1989). Common sense is the body of knowledge that everyone knows and therefore that is considered obvious. The members of society believe it to consist of that which is obviously true, but that is the same sort of naive mistake as believing that the words of one’s native language are inherently connected to their meaning, and that meaning is therefore obvious. Common sense is essentially culturally defined. Some of the things that are considered common sense may be trivial or useless, but have been invested with significance by the culture. Some may not even be true at all, but only thought to be so. These, however, are the minority. Most common sense is derived from experience in the physical world, so it is at least approximately true and will be arrived at sooner or later by every individual of every culture. Much socially acquired knowledge is of vital practical importance, aside from its value in getting along with other members of the society. That, however, does not make it obvious. The speed and necessity with which an individual member of a culture acquires this knowledge, and therefore its apparent obviousness, is a result not of its truth but of its ubiquity in his social environment. Everyone else knows these things and expects them to be known, so he learns and believes them too. This is a necessary mechanism. The human being was not designed to develop independently, but as a member of a social group. For a human being, acquiring the basic knowledge of the world necessary for survival is only possible through social learning.

All normal members of society adopt the values of the culture so they make it their business to know them. Moreover, they learn these things without effort because they enter the category of deep low-level interest. But those who are autistic do not adopt the cultural values, so they may or may not learn them. Any number of personal and practical factors may influence which things a particular autistic individual learns and
which he does not, but culturally established values and social expectations are not among them. Since the learning process by which this sort of knowledge is acquired is social, even an autistic individual who is interested in these things for practical or other reasons has a harder time learning them than anormal one does.

Much of this learning is by implication from behavior. For example, people are careful with coins, store them in secure places and do not go throwing them around in the street. They do not just give them away to anyone who asks for them, especially not in large quantities. The normal child imitates these behaviors and comes to value money, that is, to consider it something special and important. He need not be taught that later on. But in the world of an autistic child who does not imitate these behaviors, the value of money may not be learned until he begins to experience what it can be used for and how it is acquired.

Patterns of generosity and consideration for others are also cultural, socially dictated, as is evident from their variation from one culture to another. They are not inherently right or wrong, though they are certainly motivated, that is, based upon intrinsically true principles. These too, the autistic child fails to learn, therefore appearing at times uncaring, selfish or thoughtless, while at other times foolishly overkind and generous. Failure to learn certain socially determined behavior can also result in the autistic individual being considered clumsy (Asperger, 1991), especially in those cultures that attach great importance to specific intricate social rituals, far removed from physical necessity or convenience.

There can be problems with inanimate and nonhuman objects as well, especially artifacts such as machines. These are designed by people and for people, so they, too, reflect the thought, habits and customs of a culture. Since, however, they must conform to the physical world, they are more “logical” than arbitrary artifacts, so the child may come to understand them ontogenically. Autistic children who have the aptitude and inclination to make such ontogenic discovery can become impressively skillful in some areas, especially when compared to their deficiencies in others. Such uneven development is less likely in normal children, in whom all learning involves a large social factor, and those who excel generally do so globally.

Part of “common sense” is “good judgement”. Here again, what is considered “good judgement” in the eyes of most people is socially defined, not absolute or objective. Objectively, some of the odd behavior of autistic individuals is no crazier than the normal behavior of others. By and large, however, most of common sense and good judgement are, if not exactly valid, at least approximately so. They are tried and true, developed by the culture over years and generations.

In light of the earlier discussion of origin of sense of danger, it is not surprising that autistic children often fail to fear certain genuine dangers and, on the other hand, may fear other things that are perfectly harmless. These private fears are no stranger than superstitions and other irrational communal fears, but they are considered strange because they are not shared. Eventually, the more intelligent autistic individual learns to fear those things that are really dangerous. Some they learn by personal experience, some by reasoning.

In some cases, however, even personal experience may not be learned from because the individual has not learned how to connect events and see causal relationships
For normal children, the concept of causality is largely culturally learned. It, too, is part of common sense. Along with it is the question of which aspects of an event should be considered salient. Without these, an individual may be unable to draw even simple conclusions from experience.

6. Sensation

Even such low-level experiences as pain are profoundly modified by culture. Similar sensations are experienced differently by members of different cultures (Melzack, 1973). Northern cultures, for example, tend to be more tolerant of pain while Mediterranean cultures tend to be more expressive. A situation that is experienced as painful by an Italian and expressed as such may evoke no visible response in a German. This is not simply a matter of suppression of display. The experience itself differs. Cultural norms affect whether a sensation is perceived as painful or not, and sometimes whether it is noticed at all. Food that is considered tasty in one culture is intolerably spicy or sour in another. The temperature at which drinks and food are taken varies similarly.

Autistic children who fail to adopt these norms may seem insensitive to certain sensations generally considered painful, and hypersensitive to others that normal members of their culture ignore. This need not be seen as an innate neurological abnormality, but a development of perception that is abnormal by the standards of the culture. In some individuals this is found in the extreme form of blatant lack of concern for pain. In others it consists of unusual pain and pleasure preferences (Rimland, 1964; Delacato, 1974).

The context of an experience is also different for the autistic individual. Everything a person experiences is interpreted in context (Wittgenstein, 1958), whether he be normal or autistic. But for one who is autistic, the context is more his own thoughts and less the outside world and the thoughts of others.

Since adapting socially standardizes desires and perceptions as well as cognition itself, society will tend to satisfy the desires of the normal individual and protect him from those things that bother him, as it does all its members, because his are the same as theirs. But if one fails to standardize himself in this way, his personal world will end up radically different from theirs, and he will find the physical world, as modified by society, unsatisfying and even irritating. In addition, the behavior of others will be unintelligible to him because he does not share their basic feelings.

The role of social learning in the development of feelings and emotions is a key link between social learning and many other traits of autism. It must therefore be discussed before the others.

7. Emotion

The claim is often made that autistic individuals lack emotion or experience emotions less intensely than normal individuals do. However, it is well known that
strong emotional reactions, especially negative ones, are exhibited by autistic individuals in certain situations. There is also sometimes clear indication of sensitivity to moods and feelings of others, even before there seems to be any responsiveness to verbal or nonverbal cues (Simons & Oishi, 1987; Frith, 1989; Barron & Barron 1992; Grandin, 1995). Here again, the illusion of lack of emotion is partially the result of lack of recognition of the role of culture, this time in the experience and expression of emotions among normal individuals. The three aspects of emotion, the experience itself, the situations that evoke an emotion, and the way it is expressed, are all, to a large extent, culturally defined. Certain situations are considered to be distressful, others pleasurable. The normal child learns standard expressions of emotions from his caregivers, as well as learning in which situations they are expected.

With respect to more complex emotions involving a greater degree of interpretation, there can be no question about the contribution of culture to their development in the individual. Which situations are considered embarrassing, which uplifting, what is perceived as a threat, what as an insult or a compliment are not only determined by the culture, but may even vary within a single culture, for instance, depending upon the social status of the individual experiencing them. There are even some emotions that are recognized by some cultures but are unknown in others. In some cases the only thing lacking in one culture as compared to another may be a distinct mode of expression, the emotion therefore remaining undifferentiated. It is experienced and expressed, but not in a unique way and not identified by a special name. In other cases, the emotion itself is not experienced at all. In some cultures, one is expected to feel ambition and pride in accomplishments, while in others not. Specific emotions such as indignation, envy (as distinct from jealousy), resentment, admiration, boredom, interest, respect, guilt, and depression may not be universal (Heelas, 1996).

Now, to say that an emotion or any other behavior is culturally learned and may be absent in an individual whose social learning mechanism does not function sufficiently is not to imply that emotion or behavior is completely arbitrary and not consonant with the physical human condition, internal and external. Like many other cultural institutions, far from being arbitrary, it may be absolutely necessary for human survival, but not obvious enough for most individuals to discover by themselves, at least not within the short period of time before it becomes desirable to begin practicing it.

Of these three aspects of emotion, the experience of emotion, the situations in which it is evoked, and the mode of its expression, the first may be questioned and even the second, but there can be no doubt about the third. Whether or not the emotions themselves are socially learned, their expressions certainly are. So when autistic children who have failed to learn them express their emotions in unique individual ways, their expressions will not be understood, and perhaps not even be recognized as such, except by those who know them well.

This acquisition of standard modes of expression begins at a very early age. Infants have a small range of innate vocalizations that are independent of culture and therefore recognizable by any adult (Ricks, 1979; Frith, 1989), but gradually these are replaced by artificial ones that are generally more complex and more specific. For normal children they are culturally standard ones that are learned from caregivers.
But autistic children develop expressions idiosyncratically, so, while some produce differentiated vocalizations in different situations, such that their own parents become able to recognize them, they do not learn the culturally standard ones, so other adults cannot (Ricks, 1979). Moreover, the sound of standard ones does not evoke the thought of the situation for them, so they are unable to understand the vocalizations of others.

As for the experience of emotion and the situations in which it is expected, abnormal sensitivities and perception of experience, discussed earlier, make some sensations and situations that are pleasurable for normal children painful, threatening or neutral for some who are autistic, and others, that normal children find painful, pleasurable for them. The abnormal responses to these situations may therefore be quite appropriate, given the quality of the experience for that individual, but will be misunderstood by those unfamiliar with his unique personal world.

Furthermore, to the extent that the emotion is a response to a cognitive evaluation of the situation, as fear is to recognition of danger, the autistic child who has not learned to interpret experience in the standard way of his culture may also experience emotions that are very different than those of his comrades. Since the significance of the situations is different for him, the emotions they evoke will not be standard either (Simons & Oishi, 1987; Barron & Barron, 1992). This abnormal cognitive interpretation is analogous to abnormal sensory experience. In both, the normal experience is not a direct product of the physical situation, as it is naively assumed to be, but mediated by social training. The unusual responses of autistic individuals to death (Frith, 1991), for example, are understood to be less abnormal when seen in the context of the wide variety of responses found in various cultures and historical periods (Stearns & Knapp, 1996).

That is not to say that the emotional repertoire of the autistic child is as rich or broad as that of the normal one. It is unlikely that, on his own, he will be able to create the many fine variations that the normal child acquires from his culture. Furthermore, the normal child learns to interpret and explain his emotions. He is taught to connect the feeling with the events that surrounded it and to ascribe a causal relationship to them. Thus, he is crying because he is sad because he dropped his ice cream. This, like common sense described above, seems obvious, but is really learned. Lacking it, the autistic child may have no conscious awareness of the connection between the emotion and the situation that gave rise to it, nor even that he himself is experiencing it (Bruner & Feldman, 1993; Simons & Oishi, 1987). An autistic child may be aware of having dropped his ice cream, be aware of an intense feeling (although perhaps not that it is his own), and also be aware that he is crying (or perhaps laughing), but not realize that there is any significance to their occurring together.

Thus, emotions in the autistic child are not only nonstandard but less differentiated. He feels something, but does not know what it is. He experiences feelings such as happiness, sadness, and fear, but may not realize that they are different from one another, as a normal child may not differentiate between the pain of burning a finger on the stove and squeezing it in the drawer. Normal children learn to differentiate emotions socially, by learning separate words for them and by learning to connect each one with its cause. For the autistic child who has not learned to name emotions,
to identify an emotion with its cause, or even to realize that it has a cause at all, each is just “a feeling” and “another feeling” (Simons & Oishi, 1987).

Furthermore, some of the physical internal feelings that normal individuals associate with emotions are actually just general excitement, not specific to pleasure, fear, etc. It is the context that defines them (Harré & Parrott, 1996). Without recognition of the context it is essentially impossible to learn “emotion” words. But recognition of situations can only happen after the autistic individual has begun to pay attention to other people, so emotional development is dependent upon reaching a certain stage of social learning. Even after the autistic individual is able to identify the feeling within himself and recognize it from one time to the next, he still must learn to connect it with the situation that produced it. This might not be possible until an even later time, because it might involve the juxtaposition of events which themselves have not yet been recognized. Thus, deficient social learning causes emotional development to lag behind the development of language and cognition in general.

The simpler emotions such as happiness and sadness are eventually recognized by all but the more severely retarded autistic children (Baron-Cohen, 1995), because they become obvious even with minimal attention. For moderately complex emotions such as surprise, which involve both a sequence of events and a broader context, much more must be noticed and correlated, so much more attention must be paid. Emotions that are even more complex and whose expressions are subtler may continue to elude even the brightest autistic adults, unless they make a special conscious effort to learn them. In this, instruction by either normal or more advanced autistic teachers can prove very helpful.

As the normal child gets older, his behavior becomes progressively more standardized. By imitating the actions of others, the normal child increases both his understanding of them and theirs of him, thus normal adults become aware of each other’s emotions and empathize with one another. Here, perhaps more than anywhere else, even the most capable autistic individuals find it impossible to keep up.

The normal child learns these social standards because he attends to both the emotion-evoking situations of others and to their expressions, thereby learning to recognize the correlation between them. But the child who pays little attention to human beings will be slow to notice their expression of emotion and to locate a feeling similar to his own in the objects that are their bodies. Many of the expressions of emotions are subtle and minute, and therefore not easily identified. The pieces must be learned separately and correlated. This is a gradual cumulative cyclical process, as described above. It would be impossible for a human being to reach an advanced stage of competence without proceeding through some sequence of simpler steps. Grasp of complex emotions is only possible at an advanced stage of the social learning cycle. Until the necessary stage is reached, the emotion word itself remains a mystery. The autistic individual may learn it, be able to repeat it and perhaps even use it correctly in a sentence, but still cannot grasp its meaning.

Lack of comparable early life experiences, too, makes it difficult to understand others. Normal human beings understand each other because they have common experiences. These involve both how sensations are experienced and how experiences are construed, which, to a large extent, is socially influenced, even socially determined.
The normal child learns what he should want and how things should appear to him. He learns what counts as success and what he should be pleased with (Schotter & Gregory, 1976), what counts as pain to which he should respond with cries and complaints and should try to avoid (Melzack, 1973), what counts as pleasure to which he should react with joy and laughter and should seek. Normal people live in the same world as one another, not because they find it that way but because they make it so. Each constructs his world to be like that of the others. It is an active similarity, not a passive one. The autistic individual, or any who fail to do this, end up in a world that is different, a world of their own.

The task of understanding others and being understood by them is further complicated by the dynamic nature of cultural institutions, including emotions. For the normal individual, emotions and modes of expression do not always remain stable. As the cultural modes change, he is continually readjusting his own to conform with them. Thus, the emotional knowledge of the normal individual is not preserved entirely internally. Ultimately, it is the communal knowledge that is the standard, and that of each individual is a reflection of it.

Abnormal emotional development is in turn a major impediment for subsequent social learning. For the normal individual, the sharing of emotions and experiences with others reinforces his identity with the group and encourages participation and mutual activity in the course of which further social skills and knowledge are gained. Thus, again, development is cyclical, so the defective social learning mechanism of the autistic child handicaps him exponentially.

8. Language

Of all the socially acquired skills, language is perhaps the most important. Once established, it functions as a major link in the social learning cycle and gateway to more advanced social learning. It is also among the most striking in its absence. A child who speaks but fails to make appropriate eye contact may be considered odd, but one who fails to speak will be quickly recognized as seriously deficient whether he makes eye contact or not.

There are two precursors to language proper. One is communication by means of motions such as reaching and eye contact (Bruner, 1975, 1977; Collis, 1977). Those who consider the primary cause of autism to be the lack of a theory of mind have interpreted the normal prelinguistic behavior as indicative of innate attribution of thoughts and emotions to other human beings, and interpret the abnormal patterns of eye contact and other nonverbal communication characteristic of autistic individuals even at later ages as indications of lack of that innate concept (Leslie & Frith, 1990; Baron-Cohen, 1995). Extensive studies of interaction between infants and caregivers contradict this claim. Coordination of gaze has been shown to be the product of a long period of training in which it is the caregiver that follows and responds to the gaze, actions and vocalizations of the infant, the latter showing no indication of attributing any significance to those of the caregiver (Kaye, 1979). The innate aspect of these interactions consists of the spontaneous behaviors of the infant and the response
behaviors of the adult, for which the infant’s behaviors serve as stimuli. Neither involve any innately endowed concepts on the part of the infant. It is the interaction of these innate behaviors that eventually leads the infant to the first stages of communication.

At this stage, too, the claim that the infant has begun to attribute mental states to others is unfounded. Although he has discovered that his own actions can evoke certain responses on the part of the caregiver, he need not consider the caregiver as being moved by thoughts or emotions. His actions need be based on no more than expectations of certain sequences of events on the basis of past experience.

The second protolinguistic action is the imitation of sounds. At first, this is not performed for any purpose, but simply as an instance of the innate tendency to imitate (Ricks, 1979). Once imitation of a few sounds has been perfected, however, the infant discovers that these, too, can be used to evoke desirable actions in caregivers. This need not involve food or other physical reward, but simply the pleasure of seeing or hearing the caregiver smile or vocalize. Thus, the two join to produce the beginning of language (Bandura, 1989).

This happens without any concept of meaning. The sounds are at first not symbols but purely functional. When, shortly thereafter, a crude symbolism begins to develop, it is still far from mature conceptual language. Adults tend to interpret children’s language use in terms of their own, attributing to the child who uses a word thoughts similar to that of an adult using it. As Vygotsky (1987) demonstrated, this is a gross error. Even for older children, who have begun to master language and for whom words have gained meanings, the meanings are not the same as those of adults. Extreme caution must therefore be exercised in attempting to understand the language and other actions of children. Similarly, the fact that a child appears to be aware of the moods and thoughts of his caregiver because he behaves the way an adult with such awareness might be very misleading.

Even this rough early stage of language is dependent upon several necessary conditions. First, the child must attend to the vocalizations of his caregivers. Second, he must be inclined to imitation in general, and in particular, to imitating these sounds. Third, he must be inclined to respond, that is, to perform some, perhaps undefined, action in response to certain actions of caregivers, such as laughing or smiling when smiled at or spoken to. The inclination to respond and that to imitate are independent of one another. Response sometimes involves imitation, but in other instances it does not. Imitation, on the other hand, can occur in other contexts, where it is performed long after the model, and is in no way connected with any action of a caregiver or anyone else.

The lack of these or certain other necessary conditions might result in the combination of abnormal behavior characteristic of autism. Thus, it has been found (Ricks, 1979) that autistic children ignore vocalizations of adults, even those vocalizations that are familiar to them, to which normal children would attend and imitate. There are other conditions, however, the lack of which would result not in autism but in different kinds of deficits. The effect of lack of the ability to discriminate between certain kinds of sounds, would be restricted to language development. It is therefore the category of requirements of the more general social learning process that is relevant to our discussion.
In light of this, it can be seen why the operant conditioning methods of Hewett (1965) and Lovaas (1977) and similar techniques are successful in bringing some autistic children to a level resembling the early stages of normal language acquisition, by forcing them to attend, respond and imitate. Ultimately, however, they fail in enabling them to transcend autism because they do not address the general problem but only a specific manifestation of it. The acceptance of such techniques among those involved in treatment of autism reflects partially the inordinate concern among the general public for lack of speech, as opposed to other deficits. Normal adults find it shocking and disturbing that these children do not speak, and feel that if only they would, their problems would be over. They believe that it is because the autistic child does not speak that he does not communicate. But the autistic child does not communicate because he has not entered into a social structure, of which communication is but one aspect, and speech but one form of communication (Simons & Oishi, 1987; Prizant & Weatherby, 1989).

The speech achieved by these methods is therefore usually rote and mechanical, consisting of stock phrases that subjects have been trained to use in specific situations. Most are produced only in response to questions they have been trained to recognize. Even this meager repertoire, forced upon them through tedious repetition, is frequently used incorrectly. Inappropriate answers are given when presented with questions varying slightly from the learned pattern, showing that not even these simple rules have been mastered correctly. What has been achieved is not a primitive stage of normal language but a simulation thereof. Simons (Simons & Oishi, 1987), on the other hand, whose methods have been recognized as among the most successful in therapy of autistic children, insisted that language training must be kept within the context of overall social and emotional development.

In most autistic children who are not otherwise retarded, language does eventually develop without operant conditioning, but in very different ways than it does in normal children. In many cases there is first a stage in which broad comprehension is developed without any production at all. When production does begin, it is sometimes sudden and in complete sentences, showing that the child could have spoken long before, but either he did not want to or it did not occur to him to do so. He has clearly been observing language use and learning about it as one might about any other natural phenomenon. In other cases language begins gradually as in normal children, but in an entirely functional manner, consisting, for instance, of names of desired objects produced only to obtain them. This is in sharp contrast to language development of the normal child, which begins as a social activity (Tager-Flusberg, 1989). The exchange of words between child and caregiver is but one of many give-and-take and shared attention behaviors. Language begins in a social context, and even after its symbolic significance is grasped, the social context remains primary (Bruner, 1975, 1977; Ricks, 1979).

After the normal child has begun to attach some crude meaning to the sounds that he has learned to make in social games, his language knowledge gradually becomes united with his world knowledge. His use of words like “bottle” and “dolly” is correlated with the knowledge he has about the physical objects with which they are identified (Bandura, 1989). But even as old and familiar words become more firmly
and accurately connected with their meanings, new words are constantly being learned which are, as yet, simply sounds that are to be fit into the greater pattern of speech. One interesting example at a more advanced age is the word “even”. The child learns to place it before a statement and modulate the voice in the way of adults long before he comprehends its significance as an indicator of something unexpected, difficult, or unlikely, therefore occasionally producing sentences like “I even had corn flakes for breakfast!” Nor is this process completed with childhood. Adults continue to pick up new words like “virtual reality” and “paradigm shift” and learn to use them properly without a precise understanding of their meaning. Normal language acquisition therefore consists of two parts, one syntactic, in which the individual learns the linguistic use of a word, and the other semantic, in which its meaning and significance with respect to the world is learned.

But for autistic children it is different. Since they do not learn words socially, they do not begin by learning to imitate social patterns of word use. For some, words may be interesting purely as sounds to be played with. For others, interest in words may begin only as they begin to grasp their meaning. When, after attending to the sounds produced by human beings, they discover, perhaps with the help of the usual language training behavior of their caregivers, the connection between those sounds and their physical experience, language becomes a game of symbolizing the world, a sort of propositional calculus. Their concept of language is very much like that eventually rejected by Wittgenstein (1958) as only being a part of the actual language use of human beings. They understand nouns, verbs and modifiers as symbols for objects, actions and qualities, and in this limited way become able to communicate. The development of language in autistic children is therefore fundamentally different than in normal ones (Tager-Flusberg, 1989).

It is clear why someone who approaches language in this way will have difficulty with idioms. Idioms are essentially not analytic. The meaning is only tangentially related to the component words. It is the expression as a whole that stands for the concept it symbolizes, so it must be learned as one would learn a single new word. But learning idioms is more difficult than learning single words, first because this composite word does not generally stand for a specific tangible object or action, and secondly, because its composition of individual meaningful words is misleading, implying that its total meaning can be derived from them.

Even after the idiomatic usage has been learned, an autistic individual’s initial response may continue to be to the literal meaning. The literal meaning continues to loom larger than the usage, because he lives more in the world of words than that of people. Eventually, however, if an idiom is used often enough, the usage becomes primary, becoming the “real” meaning of the words in that context or combination.

9. Conversation

An autistic individual sometimes fails to grasp the central theme of a conversation (Frith, 1989). Though he understands the individual elements, the mental organization of the speaker is so different than his own that he cannot follow the connections the
speaker is making. Some autistic individuals, as a result, may not even realize that conversations generally have a central theme at all. Since the conversations of others seem arbitrary to them, their own contributions, if they participate, are also arbitrary, wandering from one subject to another by free association. Failing to distinguish between what is central and what incidental and peripheral, the most recent or most vivid becomes most salient and thereby determines the direction of the conversation from that point on (Bruner & Feldman, 1993).

Wandering from one topic to another is not unique to autistic speakers. Normal people do it too, but since they all do so by the same conventional rules, their conversations seem coherent to other members of their culture. So even an autistic person who recognizes the basic idea that a conversation has a central topic may have difficulty making acceptable contributions because he has not learned the conventional ways by which the topic is changed. Other conventions acquired by normal speakers but not autistic ones involve gaze and other body cues used to indicate turn taking, distance between speakers, and duration of tolerated silence between speakers, all of which vary from one culture to another (Frith, 1989).

Autistic speakers and writers also often fail to introduce new topics by providing sufficient background information (Happe, 1991). This too is partially because the rules of what is to be assumed known and what must be explained are cultural. The audiences of normal speakers and writers do not always know all the necessary background information either, but they tolerate the lack of explanation because they recognize it as something that is not usually explained. Furthermore, knowing in advance what things they are expected to know and will therefore not be explained for them, they make it their business, when possible, to learn and remember them.

10. Regularity

The third major category of autistic traits is insistence upon regularity, most noticeable in the tendency to adopt inflexible habits and rituals. Insistence upon regularity is not, in itself, unique to autism. All human beings need and crave regularity, and for good reason. It is necessary for adaptive functioning, and therefore for survival. For lower animals such as insects, whose behavior is innately determined, it makes little difference whether their environment is regular or not. If it is compatible with their innately determined behavior they will survive, and if not they will perish no matter how regular it is. But the behavior of higher animals is flexible. It can be modified by the individual to become better adapted. This obviously requires a consistent environment. If the environment is constantly changing it is impossible for the individual to adapt to it, for what is beneficial today may be harmful tomorrow.

Desire for regularity is therefore a survival mechanism. It exists on two levels. First, there is an innate desire that does not involve rational thought, which has the effect of directing the member of the species to experience situations that are regular and therefore in which useful learning can be acquired. Superimposed upon it is an ontogenic one derived from experience dealing with the world in regular situations and chaotic ones. The mental energy necessary for simply processing sensations, even
if no action is being taken, is less when they are regular and therefore predictable than when the unexpected is always happening. Any higher animal can be driven mad if the rules are changed too often.

There are several important variables to these desires for regularity. The first two are the optimum level of regularity and its acceptable range. These vary from species to species, and within each species from individual to individual. Even for a particular individual, they vary from situation to situation. Too little regularity is confusing and disorienting, and it is impossible to know how to respond. Too much is boring, at least for higher species (Berlyne, 1960; Zentall & Zentall, 1983).

Other variables involve perception. Only certain aspects of the environment are noticed, and of those noticed, the desire for regularity may apply to only some. There might be others that are perceived, but for which regularity does not seem to matter. Furthermore, the degree of similarity necessary to be considered regular varies. Slight differences may not be noticed, or, if noticed, may be tolerated. Situations that are sufficiently similar can be considered functionally identical, although not actually so.

For normal human beings, a large part of the desired regularity is provided by society. This is achieved in several ways. First, society regularizes life to an extent sufficient for its members. Time is regularized by schedules, space by territories, each endowed with its own set of rules. The members of society themselves are regularized by social status, dress codes, manners, patterns of conversation, melodic patterns of speech. These are only a small sample of the all-encompassing regularization that society provides. Life in society becomes very predictable and therefore comfortable once one understands these patterns. Indeed, normal individuals become anxious if that level is disrupted, and are therefore intolerant of other cultures and of nonconformist behavior. Even the compulsive aspect of autistic insistence upon regularity may not be that far from normal behavior. Normal people get downright compulsive when one of their absolute social norms is violated, such as wearing the right clothes at the right time.

Secondly, by regulating some things and not others, society teaches its members which are to be considered important. The normal individual learns this, and is thus trained to care about what society cares about and ignore what it ignores. This training is built on top of the social modification of perception itself. The normal individual has already adjusted his perception to conform to that of society, to notice certain things and be oblivious to others. The foundation has therefore already been laid for adopting many of these standards. So the aspects of experience that society has regularized turn out to be exactly the ones that he cares about and whose regularity he craves! Since he adopts the habits and values of society, society provides for their fulfillment. His are the same as those of the other members, and society adjusts itself to provide for those needs that most or many of its members have in common.

But over and above these factors, the normal individual has less practical need for regularity because he identifies with society. It is not only that he has learned a form of behavior from them, copied it and made it his own. He is continually actively copying them. His relationship to society is not one of “me” and “them” but of “us”. Even if he
does not know what’s going to happen, even if he does not know the rule that needs to be applied in the coming situation, he can rely upon other people knowing it and follow what they do. He feels confident that, whatever happens, it will be alright, because he likes to do what other people do. He has been relieved of his individual need to either know or figure out how to behave in every possible situation by becoming part of the group that knows and decides for him. The need for regularity and predictability is therefore lessened.

But the autistic child misses all this. First, since he fails to learn the patterns of behavior of other people, the human part of his environment remains chaotic, confusing and frightening to him. He is unable to see the patterns in it, so he cannot predict what will happen next. Secondly, his priorities and regulation of sensory input are not the same as theirs, because he has not adjusted them to conform, so the regularized environment created by society does not help him. It does not fulfill his needs. It may not even seem regular to him. The things they have regularized may be ones that he does not care about or even notice, while some of the things that are very important to him are ignored by other people. They may even sometimes do the opposite. Finally, since he does not identify with society, he is on his own. He must adapt and figure out what to do all by himself, so he has a greater need for a regular environment that he can learn to adapt to (Zentall & Zentall, 1983; Dawson & Lewy, 1989a, b; Ungerer, 1989).

An autistic person does not need everything in his surroundings to be in order. It is only certain aspects, sometimes a very small number (Dawson & Lewy, 1989a). Once one realizes the great degree of ready-made regularity the normal individual enjoys, this no longer seems like very much. These few serve as an anchor, while the rest may not even be noticed. The level of regularity demanded by the autistic individual may therefore not really be greater than that of the normal one. Both find it comfortable to live in a regular world, and both become upset, sometimes even frantically, when the norms about which they care are violated. The difference is that for normal people the choice is made by society.

The autistic child is prone to get into fights and temper tantrums because his world is so much at odds with that of other people. Normal children live in pretty much the same world as their family and peers, and it becomes more and more the same as they get older and learn and internalize the norms of their culture. But since the autistic child does not, his world remains different and may even become more so. Expectations are different and events are interpreted differently. The autistic child lives in a chaotic frightening world, constantly irritating and stressful. Small wonder he explodes or withdraws into himself!

Autistic rituals and stereotypies are therefore forms of positive adaptive behavior (Delacato, 1974). At the very least, they fill the child’s day with predictable and understandable experiences, so that the portion left for chaos is reduced and the ratio of chaos to order is kept at an acceptable level. Personal regularization may actually enhance his ability to function in the world by structuring it in a way that he can deal with it. The more able autistic child or adult succeeds in organizing both his own individual behavior and also his social interactions. That enables him to participate in activities with others and also reduces the amount of time and energy that must be
spent on otherwise useless rituals whose sole function is to regularize experience (Dawson & Lewy, 1989a; Howe, 1989). For example, asking everyone the same question such as “What color is your house?” is a way of controlling social situations, changing them from open-ended, unpredictable, and frightening to structured and limited, therefore manageable and safe. Normal people accomplish something similar by talking about the weather. The autistic individual’s behavior may be more limited and rigid, but that is not the major difference. It is qualitatively different in that it is not shared by other members of society, so it does not simultaneously satisfy the interlocutor’s need for regularity, as talking about the weather does.

11. Conclusion

The syndrome of autism can therefore be seen as a dysfunction of the social learning cycle. Neither the ultimate cause of this dysfunction nor the specific manifestations can serve as the defining factor, because both are variable. It is social learning that ties together the wide range of autistic traits. With respect to all these traits, normal behavior is derived to a high degree from social learning, as compared to mathematical, musical, visual and other skills that are derived primarily ontogenically by interaction with the physical world. The role of social learning is therefore a necessary link in understanding autism. Even if etiologically lower level deficits are identified, whether physiological or functional, it is via the social learning cycle that they produce the observed traits.

Several important features of social learning have been presented here that have either not been previously recognized, or whose importance has been overlooked. Among them are the cyclical nature of learning and the force of natural positive feedback in the social learning cycle.

This explanation is compatible with the specific deficits of theory of mind, central coherence, and executive function, but the causal explanation avoids the problems of nativist theories which, attributing autism to the lack of a specific cognitive module, are unable to explain many known traits. It also explains why there is a strong tendency for certain traits to be present, but not absolute necessity. In particular, it may explain the relationship between autism and mental handicap. Both mentally handicapped autistic individuals and those of normal intelligence share a functional deficiency in social learning, but for different underlying reasons. Since some components of the social learning cycle are also necessary for other kinds of mental development while others are not, in some individuals other areas of intelligence are affected and in others they are spared.

Perhaps, our culture has such trouble understanding autism because it has a basic misconception about normal people and the mechanisms by which they learn, underestimating the social factor in the development of the individual in favor of internal ones. The human mind was not designed to work alone but in interaction with other minds. It is not only with respect to physical survival that the individual is dependent upon the group. Normal cognitive development, too, can only take place
when the individual adopts the behavior of mature conspecifics, thus becoming heir to the cognitive store accrued by the group as a whole over the course of generations. It is only the autistic person whose development fits the primarily ontogenic description. Recognition of the pervasive role of social learning in human development provides the key to answering many of the questions presented by autism.

Note on style: Masculine pronouns are used throughout as the unmarked grammatical form. They are to be understood to indicate masculine or feminine. For example, “he” is to be understood as “he or she”.

References


