the other hand, it gives KASPAR's designers considerable leeway in engineering (and later programming) customized versions to suit a variety of needs.

Autistic children interact quite readily with KASPAR from the first meeting.[33] In its present version, the robot is dressed as a little boy. It is capable of moving its torso, arms, and head. It can also open and close its mouth and eyes. This restricted range of movements gives KASPAR a "minimal" emotional expressiveness, uncomplicated and easy to interpret. Taken together, the movement of eyes and arms, posture, and voice permit it to express several basic emotions: joy, sadness, surprise.

KASPAR is not an autonomous robot. An operator controls its movements and speech using what is known as the "Wizard of Oz" technique.[34] Its usefulness as a social mediator and as an instrument of therapy therefore depends on human intervention. KASPAR succeeds in getting autistic children to take part in a wide range of interactive games that usually are not accessible to them because they involve activities such as imitation, turn taking, and shared gaze. With the aid of different game scenarios, Dautenhahn's team set out to evaluate KASPAR's educational and therapeutic potential for treating autism in children, in addition to developing their social skills.[35]

KASPAR's principal role is as a social mediator in the relationship between an autistic child and a therapist, a teacher, or other children. In this regard, it is often used to teach autistic children to express their own emotions (sadness or joy, for example) and to recognize affective expression in others. Studies suggest that KASPAR's expressive minimalism, implying an extreme simplicity of interpretation, furnishes these children with a sufficiently predictable and reassuring social context that they are able to play with others and to try doing new things. Another application of the same type, made possible by the robot's epidermal covering, RoboSkin,[36] involves a game that



teaches the child to exert an appropriate degree of force when interaction brings him into physical contact with others. Some autistic children who exhibit tactile hypersensitivity or hyposensitivity find it difficult to properly modulate the strength they bring to bear while playing. Here again, interaction with KASPAR furnishes such children with a protected environment that is easily understood and reassuring. When a child fails to correctly judge the amount of force that should be used, the interaction nonetheless continues without interruption and the child is not made to feel rejected. Instead, KASPAR sends a clear message—"Ouch! That hurts!"—without getting angry and ejecting the child from the game, as other children often do.

KASPAR is often used with so-called high-functioning autistic children as well. To be able to join in playing a video game, for example, the autistic child must imitate the movements that the robot executes. In this way, thanks to KASPAR's mediation, he learns to cooperate and to take turns playing the game with a normal child. The robot can also be used to help autistic children discover their body image, following its example. By touching and naming this or that part of its humanoid body—the nose, the ear, the arm—the robot teaches the child to do the same thing.

The effectiveness of all these learning experiences proceeds from the fact that the robot provides the child with a relaxed atmosphere in which, unlike the social situations he is used to, he is protected from the awkward and often distressing consequences of his many errors of interpretation. The robot never reacts in a reproving or dismissive way when the child behaves inappropriately. Instead, it gently corrects him while at the same time providing reassurance, by means of firm and unsurprising responses that are unlikely to be misunderstood and that encourage the child to persevere in the difficult work of learning social skills. The ability to give both comfort and cheer—

feelings we experience in the company of pets as well—is common to many robots used in a therapeutic setting, not only ones such as Paro but also substitutes designed to help people who have suffered a stroke or other cerebrovascular accident, or any injury that suddenly compromises one's ability to perform elementary daily tasks. In this connection, where motor and cognitive rehabilitation is inseparable from *social rehabilitation,* several studies show that many patients prefer to perform therapeutic exercises under the supervision of a robot rather than a human nurse, whose presence is apt to disturb or embarrass them in trying moments, when they prefer not to have to compare themselves to other people.[37]

The reassuring character of such interaction is also the basis for a number of recent developments, among them the suggestion that KASPAR might be used by police for questioning normal children who are victims of abuse or surviving witnesses of accidents or criminal acts. These children often find it difficult, or are afraid, to speak candidly to an adult. According to the Metropolitan Police in London, they frequently do not furnish useful leads, and they sometimes give false or misleading information. The guiding assumption is that when interrogators, even if they are trained social workers, hear certain accounts of abuse, they find it very hard not to transmit nonverbal signals that the child finds disconcerting, causing him to hesitate and either stop talking or change his story. A robot, it is thought, may be perceived by the child as a more neutral and less threatening conversational partner, making it possible for him to treat a delicate situation as a sort of game.

This proposal nonetheless raises important ethical issues. The child is not aware that he will be speaking to a human being when he is made to interact with the robot, and the interaction is for the express purpose of inducing him to give information that he might not give otherwise. In this sense, it is indeed a question of fooling the child, of making him believe that he is speaking to a robot when in



fact a human being is listening in and doing the talking. This deception nonetheless assumes a form opposite to the one for which robots are usually reproached. Usually, a robot is accused of having false emotions, because it pretends to have emotions like those of human beings, whereas in fact, it is claimed, they are not the same, because there is no corresponding internal state. Here, to the contrary, the idea is to reassure the child by making him believe that he is dealing simply with a robot. If the child is fooled, then, it is not by a robot, not by a machine, but by adults, by other human beings.

KASPAR's undoubted successes in other domains expose the shortcomings of most current ethical thinking about the use of robots in educational institutions, hospitals, and specialized centers for children and adults with particular disabilities. Social robots are often thought of as a way of delegating the obligations associated with such care to machines, rather than taking responsibility for it ourselves. But robotic interaction partners such as KASPAR cannot *replace* human beings. They can only *support* them in providing aid and treatment. In this sense, robots are *substitutes* for human partners—intrinsically *temporary* substitutes, designed to make it easier to establish social ties with those who, for one reason or another, have a hard time fitting into their social environment. What Phie Ambo in her film calls "mechanical love"—what we call artificial empathy—cannot simply be seen as a matter of false emotions, of emotions that have a positive effect only by manipulating and deceiving robots' human partners. The artificial empathy and other emotions that emerge and develop in the course of interaction between robots and human beings give rise to an affective dynamic that produces appropriate social responses. This dynamic makes it easier for those who have trouble interacting with others to enter into a social ecology—a human world that otherwise would, for the most part, be closed to them.[38]