From security to attachment: Mary Ainsworth's contribution to attachment theory

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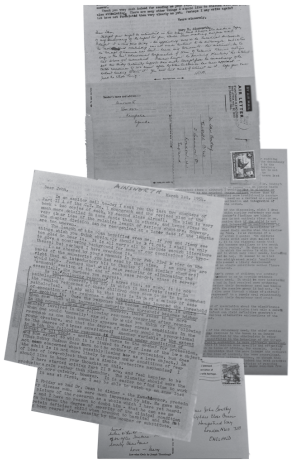

Chapter 3

Ainsworth's Strange Situation Procedure: The origin of an instrument

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ABSTRACT

The American-Canadian psychologist Mary Ainsworth (1913-1999) developed the Strange Situation Procedure (SSP) to measure mother-child attachment and attachment theorists have used it ever since. When Ainsworth published the first results of the SSP in 1969 it seemed a completely novel and unique instrument. However, in this paper we will show that the SSP had many precursors and that the road to such an instrument was long and winding. Our analysis of hitherto little-known studies on children in strange situations allowed us to compare these earlier attempts with the SSP. We argue that it was the combination of Ainsworth's working experience with William Blatz and John Bowlby, her own research in Uganda and Baltimore, and the strong connection of the SSP with attachment theory, that made the SSP differ enough from the other strange situation studies to become one of the most widely used instruments in developmental psychology today.

"So powerful is this technique in evoking behavioral changes that it is likely to be used with increasing frequency in studies of mother-infant interaction." (Ainsworth & Bell, 1970, p. 52)

Attachment theory is one of the better-known theories of contemporary developmental psychology. Its basic theme is that human infants need a consistent nurturing relationship with one or more sensitive caregivers in order to develop into healthy individuals. Inadequate relationships are considered to contribute to aberrant behavior and in combination with other risk factors to psychopathology. The theory was gradually developed by the British psychiatrist and psychoanalyst John Bowlby, together with American-Canadian developmental psychologist Mary Ainsworth, and comprehensively formulated in Bowlby's trilogy (1969,1973,1980), after which attachment theory steadily became more influential. The theory has now reached textbook status and its adherents have published thousands of studies inspired by this theoretical framework. Ethologist and Nobel Prize winner Niko Tinbergen has praised Bowlby for his "pioneering work" (Tinbergen in a letter to Ursula Bowlby, October 20, 1981), and Stephen Suomi, comparative psychologist and former PhD student of American Psychologist Harry Harlow stated that "the ideas about attachment that Bowlby developed into a formal theory are still in the mainstream of developmental psychology and child psychiatry, and are considered highly relevant in several other fields of clinical study. [...]. Attachment theory has basically stood the test of time over the past 50 years, and I believe it will continue to do so well into the future." (Suomi et al, 2008).

During the 70s and 80s, Bowlby was generally seen as the (sole) founder of attachment theory. However, as knowledge about the origin and development of the theory expanded over the past 25 years, Mary Ainsworth (1913-1999) increasingly gained credit as the co-founder of attachment theory. Ainsworth, an American-Canadian developmental psychologist, worked with Bowlby in London from 1950-1953. After her return to the US, Ainsworth and Bowlby carried on their collaboration until Bowlby's death in 1990. The importance of her contribution to attachment theory has been discussed in many recent publications. Van Dijken (1998), for instance, traced the core of attachment theory to Bowlby's early childhood and described the development of Bowlby's ideas in his early work while clearly stating Ainsworth's contribution. Bretherton (1992, 2003) described the theoretical development of attachment theory and argued that the fundamental expansion of attachment theory was made possible by Ainsworth's insights. Karen (1990, 1994) gave a compact overview of the history of attachment theory and Ainsworth's part in developing it, while

Isaacson (2006) gave an extended overview of the work of Ainsworth and Bowlby in her study on the development of attachment theory. Van der Horst (2011) devoted a separate chapter to Ainsworth's contribution to attachment theory in his biography of Bowlby. Kenny (2013), in her book on principal theories of infant development, named both Bowlby and Ainsworth as key figures in the development of attachment theory. Recently, a special issue of *Attachment & Human Development* was dedicated to Ainsworth's contribution to attachment theory (Grossmann, Bretherton, Waters & Grossmann, 2013).

One of Ainsworth's major contributions was the development of a laboratory procedure to measure and classify the child's attachment to his or her caregiver. Many authors have pointed out that this procedure, the Strange Situation Procedure (SSP), played a fundamental role in the increasing acceptance of attachment theory. Holmes (1993) for instance, stated that the SSP was essential in providing empirical evidence for Bowlby's ideas. Rather than observing caregiver-child patterns for lengthy periods of time, it now seemed possible to typify the caregiver-child relationship within the time frame of 20 minutes. Researchers were quick to see this advantage and today the SSP is widely used - a simple search in Google Scholar gives over 14000 citations (more than 4000 of which since 2010) for Ainsworth et al.'s 1978 book *Patterns of Attachment* which provides the most complete guide to scoring the SSP. Ainsworth herself has explained in interviews and articles how her early research in Toronto, where she designed instruments to measure security in young adults under the guidance of William Blatz, and her later work in Uganda and Baltimore researching the bond between mother and child, eventually led her to design the SSP (e.g. Ainsworth, 1983; 1988; 2010; Ainsworth & Bowlby, 1991; Ainsworth & Marvin, 1995; Myers, 1969; Rudnytsky, 1997; Stevenson, 1998). The finer details of this development, however, remained unclear.

In the present article, we will add a new perspective to the historiography of the SSP and show that the situation was much more complicated than these accounts would make us believe. We will shed light on similar research that was being conducted all around Ainsworth, and had been for decades. We will show that there were many 'strange situation' studies, long before Ainsworth designed her SSP, and we will discuss the possible reasons why Ainsworth's SSP turned out to be more successful than the instruments designed by her colleagues.

THE ORIGIN OF ATTACHMENT THEORY

The roots of attachment theory lie in the early twentieth century when Sigmund Freud's ideas became known in the Anglo-Saxon world and various experts promoted the study of the child. G. Stanley Hall initiated the Child Study Movement and

managed to recruit teachers and well-to-do mothers to collect knowledge about the development of children (Ross, 1972). For the first time, mothers were active as "co-researchers" and visited Mothers' Clubs or attended Mothers' Congresses to discuss "optimal" ways to raise children (Hulbert, 2003). Inevitably and increasingly, mothers were held responsible for the "outcome" of their efforts. Psychoanalysis, which rapidly became popular in the US after Hall had invited Freud to go on a lecture tour in that country (Rosenzweig, 1994), contributed to this idea. According to psychoanalytic theory, in the pressure cooker of the nuclear family the exact timing of the mother's interventions could mean success or failure for the child. Premature or delayed weaning and early or late toilet training could cause dreaded "fixation" and subsequent character malformation. Thus, according to this view, the origin of many later mental problems lay in early childhood, a view that psychoanalysis shared with behaviorism (Beekman, 1977; Stearns, 2003). The Mental Hygiene Movement, started in 1909 by the former mental patient Clifford W. Beers and the psychiatrist Adolf Meyer, shared much of this thinking (Richardson, 1989). By identifying early signs of maladaptation in childhood, experts hoped to prevent or cure mental illness. This led to the foundation in the early 1920s of so-called Child Guidance Clinics for the treatment of maladjusted children. Child Guidance Clinics employed clinical teams made up of a psychiatrist, a psychologist, and a psychiatric social worker. Inspired by psychoanalytic theory and, to a lesser extent, behaviorism, most professionals believed that the causes of deviant behavior and delinquency were to be found in the social environment and not so much in the child's genes. Sir Cyril Burt, for example, believed that "nearly every tragedy of crime is in its origin a drama of domestic life" (cited in Wooldridge, 1994, p. 99).

Burt introduced the idea of Child Guidance Clinics in England and it was while working at the London Child Guidance Clinic as a psychiatrist that Bowlby was able to learn about and put into practice many of the newer ideas. His belief that separation from the mother or mother-substitute is detrimental to the child he saw confirmed in many of the events connected to World War II (e.g., children who were evacuated without their parents, children who lost their parents) and in contemporary social policies (e.g., the limited possibility or even prohibition to visit sick children in hospitals). (Van der Horst, 2011). Combining clinical observations with theoretical insights and empirical evidence from the fields of psychology and ethology, Bowlby gradually developed his attachment theory as published in his well-known trilogy (Bowlby, 1969, 1973, 1980). His general message that children need a stable, and preferably full-time attachment relationship with a loving mother (or mother substitute) was well met after the war when many mothers did not work and raising children was viewed as a female responsibility (Riley, 1983; Wootton, 1959).

Bowlby was a theoretician who collected retrospective data about the possible detrimental effects on the child of a suboptimal mother-child relationship but he had

no instruments to do prospective research. The bulk of his conclusions were based on the effects of gross separations from the mother and the finer details of inadequate mother-child relationships could only be unearthed in time-consuming clinical research. It was here that Ainsworth's Strange Situation Procedure (SSP) came as a godsend. The SSP is a laboratory-based procedure (in this case a standardized simulation of a stressful situation) intended to reveal patterns of caregiver-child attachment. It quickly gained popularity among attachment researchers and is regarded to be a reliable instrument with good predictive validity (Solomon & George, 2008). The SSP is widely used these days and it has even been adapted to assess the bond between dogs and humans (Rehn, McGowan, & Keeling, 2013). Although numerous articles and chapters have been written about the SSP, little is known of its origin and history. Story has it that the Strange Situation Procedure was thought up by Ainsworth and her assistant, Barbara Wittig, in about twenty minutes (Inge Bretherton, personal communication, March 2, 2013). It may well have been. We will see that it did not, however, come out of thin air. Ainsworth's extensive experience in researching security and development of attachment, combined with a social background of increasing attention for mother-child relationships and their effect on child development, paved the way for the construction of the Strange Situation Procedure. The wish to intervene in the social environment of the problematic child created the need for a tool to measure the quality of the mother-child relationship and facilitated the quick and broad acceptance of the SSP.

DESCRIPTION OF THE SSP

According to attachment theory virtually all children become attached, but the quality of their attachment relationship differs and insecure attachment may result in developmental problems. The SSP, by prompting attachment behavior in the child, allows for classification of attachment security. The SSP as it is used today is basically the same as it was when Ainsworth first used it in her Baltimore Study (Ainsworth, Bell & Stayton, 1971; Ainsworth & Wittig, 1969) and consists of eight episodes. In episodes 1-3, the child (in the company of the caregiver) is first confronted with a strange environment (a play room) and then with a stranger (an unknown research assistant). During the fourth episode, the caregiver leaves the room and the infant is left with the stranger. The caregiver returns during the fifth episode and the stranger leaves. The caregiver then leaves again (episode 6), which means the infant is alone in the room. The stranger returns (episode 7), and eventually the caregiver also returns (episode 8). In order to avoid effects of different parental behavior during the SSP as much as possible, the caregiver is asked to respond to the child only when necessary and not to initiate any interaction. Originally, the SSP was observed through a one-way window and observations were dictated simultaneously by at least two observers. Nowadays, the behavior of the child is captured on film and coded afterwards.

The three components of the SSP (the strange environment, the stranger, and the separations from the caregiver) make it stressful for children and prompt attachment behavior. Special attention is paid to the episodes in which the caregiver is reunited with the child after the brief separations. During these episodes (5 and 8) it is estimated how much the child trusts the caregiver by looking at the child's behavior and at how long it takes before the balance between exploration of the environment and focus on the parent or caregiver has been restored. The way in which the child approaches the caregiver at the reunion and seeks contact, or tries to avoid contact, is angry, or acts in a disorganized way, is decisive for the attachment classification. Children's attachment to their mother can be classified as secure (B), insecure avoidant (A), insecure ambivalent (C), or disorganized (D).

Strong claims regarding attachment's continuity over time, its impact on later development, and claims regarding maternal sensitivity as the most important precursor of Strange Situation behavior have not been unanimously supported by the scientific literature of the last 40 years, however (cf. Groh, Fearon, Bakermans-Kranenburg, van IJzendoorn, Steele & Roisman, 2014; Lamb, Thompson, Gardner, Charnov & Estes, 1984; Vicedo, 2013). Ainsworth herself later expressed regret at the fact that the SSP had ended up as a stand-alone instrument, often being used as a short-cut method, instead of being used in combination with home observations (Ainsworth & Marvin, 1995). Nevertheless, regardless of its possible limitations, attachment researchers value the SSP as an important instrument and have embraced it as a prime measure of attachment. In addition, many of the adult attachment researchers that started to design their own instruments in the 1980s used the SSP as a model to work from (Van Rosmalen, Van IJzendoorn & Van der Veer, 2014). If we want to explore the historical roots of this widely used instrument we need to go back a century.

PREHISTORY OF THE SSP

Against the backdrop of increasing interest in the mental health of children in the early twentieth century, a considerable amount of research was being done regarding fear in children. Researchers tried to find out what caused children to be afraid and studied their reactions or tried to find methods to overcome these fears (Jersild & Holmes, 1935). Hagman (1932), for instance, studied the overt behavior of children taken into a room, left alone, and subjected to a phonographic recording of artificial thunder as a possible fear stimulus. The psychoanalytic focus on separation anxiety caused interest in the influence of an unknown environment on the child's behavior and/or the effects of separation from the mother. Nancy Bayley (1932) reported on an observation of 61 infants that underwent a range of tests, during some of which it was

necessary to be briefly separated from the mother. Bayley put their crying down to, amongst other things, the "strangeness of place and persons" (p. 316).

The first time we see a detailed description of the reactions of children specifically to a strange person in a strange room, and the behavioral patterns in which the fear is manifested, is in an unpublished study conducted in the early thirties called "The behavior of the child in strange fields" by F. Wiehe, a student of Kurt Lewin (Lewin, 1935). Lewin, famous for, amongst other things, his Force Field Analysis which looks at the factors that influence a situation, stated in 1933 that "the presence or absence of the mother changes the total structure of the psychological environment very essentially, especially the child's feeling of security or insecurity" (Lewin, as cited in Bretherton & Munholland,1999, p. 97). Wiehe studied children's behavior towards a stranger as they were taken into a strange room, sometimes accompanied by their mother, sometimes alone, or a strange person was brought into the child's home. He then observed the actions of the child towards the stranger by noting down the presence or absence of fifteen possible actions (listen to, look at, turn bodily toward, smile at, speak to, address to, express wishes, give or throw something, make bodily contact, stay nearby, ask personal questions, demonstrate ability, show off, make demands, affective reactions) at six different degrees of "strength of the social field". This degree of strength was a function of the spatial distance to the stranger, the duration of his presence, and his conduct. Wiehe found the strongest pressure resulting in the child becoming motionless, and a weaker degree of pressure causing the child to cry or to run away or towards his mother. The less pressure on the child, the more natural free behavior was shown. Wiehe's study was the first that didn't just note that strangeness caused fear in the child, but also paid attention to how this fear was expressed in the child's exploratory behavior. Being a student of Lewin, he analyzed the child's behavior in topological terms (i.e., in terms of forces and valences present in a specific situation or "field"), just like Arsenian, another student of Lewin, would do several years later.

In the early forties, Prichard and Ojemann (1941) noted that 'insecurity' was frequently listed among the possible causes of behavioral problems and called for clarification of the terms 'security' and 'insecurity', and for a uniform way to measure them:

> Careful analysis of the literature reveals that there is little agreement as to the meaning of these terms and that methods of identification and measurement of insecurity are not well developed. [...] It would be most helpful if we could develop more precise methods of classifying children with respect to the strength or frequency with which this desire motivates their behavior. We need methods by which we can discriminate between the relatively secure and the relatively insecure children (Prichard & Ojemann, 1941, p. 114).

By comparing two groups of preschool children aged two to five, one group labeled 'secure' and one labeled 'insecure' by their respective teachers, Prichard and Ojemann

developed a security rating scale based on the behavior of children in a preschool environment.

In the late 1930s, Mary Shirley and Lillian Poyntz were curious to the effects of modern American life on children, since an increasing number of mothers were employed outside the home and nursery schools spread rapidly, when at the same time they felt that "the young child's sense of security and well-being is founded upon his experience of mother love and care" (Shirley & Poyntz, 1941, p. 251). They published a detailed description of the effects of the absence of the mother on her child during health and developmental examinations as part of a longitudinal study into child growth. The 199 children concerned, aged two to eight years, underwent half-yearly routine medical checks at the Harvard School of Public Health between 1936 and 1940. Most of these children would normally spend their days at home with their mothers. As they were left by their mothers at the Center for Research on Child Health and Development for the whole day, this allowed for issues of separation to be studied. Apart from looking at the behavior of the child throughout the day, special attention was paid to the separation and reunion episodes, and what they might imply. As the authors argued: "The real significance of the mother's good or poor handling of the parting, however, lies in the fact that it is usually an accurate indicator of the entire mother-child relationship" (ibid., p. 268). The questions they asked about the reunion were very similar to the ones asked decades later in the SSP: "How do they greet the mother at the end of the day? What type of mother-child relationship do these reactions imply?" (ibid., p. 253). Psychoanalytic influence was clearly visible: the authors remarked that a child might be quiet in the mother's absence, but that this apparent quietness "may hide devastating undercurrents of fears and doubts" (ibid., p. 252). Just like Ainsworth would do in her Uganda and Baltimore studies, Shirley and Poyntz ascribed part of the children's behavior during their mother's absence to previous adequate or inadequate maternal behavior and aspects of the home situation. In their words: "the child's self-confidence and independence depends upon his having experienced warm and wise maternal care" (ibid., p. 282).

In 1942 Shirley was the first to actually use the term 'strange situation' as a factor to be measured. Just like in her 1941 study, children were observed at the Center for Research on Child Health and Development. This time Shirley classified the responses of the children to being separated from their mother for the day. The classifications ran from 'least mature' (crying and resisting on arrival) to 'most mature' (arriving at the center eagerly) in eight steps. Again, Shirley made a point of analyzing the children's behavior on the basis of the home situation and the mother's attitude towards child care. Children had been coming to the Center from birth, and during each visit many potentially relevant matters were recorded, starting with the behavior of the parent and the child when the child was picked up from home or dropped off by the parent.

Children's comments were noted down during their day at the center, and the parent was interviewed at the end of the day, before picking up the child. This information was compared to the child's adjustment on the day of separation. Shirley firmly believed that a child's upbringing could tell us something about their behavior in a strange situation: "The brief histories given above point in the direction of that well-established clinical hypothesis that family relationships are a factor of paramount importance to the child's adjustment in any situation" (Shirley, 1942, p. 210). The question posed in the introduction of her paper, "Is the adjustment of a child to an unusual event related to factors within his home experiences – to his relations of confidence and affection with his parents?" (ibid., p. 202), was answered in the affirmative in the summary:

> A child's level of adjustment depends [...] much more upon the wholesomeness of his upbringing in the home, and the security and affection given him by his parents. A secure and wholesomely loved child goes forth to meet a new experience in a spirit of adventure, and comes out triumphant in his encounters with new places, new materials, and new friends, old and young (ibid., p. 217).

Shirley did not mention William Blatz (see below), but this observation matched the description of what Blatz called "an independently secure child" in several of his childcare manuals (Blatz, Millichamp & Fletcher, 1936; Blatz, 1944). Shirley thus believed that children who are secure and wholesomely loved behave with confidence in a strange situation.

Ainsworth's line of thinking on the behavior of children in a strange situation bears great resemblance to that of Shirley, but for reasons unknown Ainsworth never mentioned Shirley in relation to her own strange situation work. We know that Ainsworth was aware of at least some of Shirley's earlier work because in an unpublished paper on methodological problems in parent-child interaction research she mentioned a 1933 study by Shirley (Ainsworth, 1964), and it is likely that she saw the references to Shirley's work in Arsenian's important 1943 study to which she referred on numerous occasions. However, when Ainsworth talked about patterns of attachment behavior for the first time at a meeting of the Tavistock Mother-Infant Interaction Study Group in London in 1961, the earliest researcher she mentioned in this respect was Arsenian (Ainsworth, 1963).

Jean Arsenian (1943) was troubled by the fact that even though the concept of security was now mentioned frequently by various researchers (e.g., by William Blatz, Ruth Horowitz, and Lois Barclay Murphy), there did not seem to be an instrument with which to measure it: "Plainly the problem of the origin of individual differences in security can be investigated constructively only after child psychologists have agreed on the behavioral evidences of security and insecurity in young children" (Arsenian, 1943, p. 225). She was the first to explicitly state that a strange situation may be used as a diagnostic instrument: "In any situation the specific evidence of security is assumed to

be the appearance of positively adaptive patterns of behavior; conversely, negatively adaptive or emotional forms of behavior will indicate insecurity" (ibid, 1943, p. 225). She conducted an experimental laboratory study and was the first to systematically vary the absence and presence of the mother in a situation unknown to the child, which enabled her to separate the effects of the strange situation per se from the effects of separation from the mother. Four experimental groups were formed out of a total of twenty-four children aged between eleven and thirty months. They were somewhat unusual in that they grew up in a reformatory with their mothers (cf. Spitz's sample of prostitutes in Van Rosmalen, Van der Horst, & Van der Veer, 2012), who either could not give their child exclusive care as they worked as 'helpers' in the nursery and had many children to take care of, or worked in distant parts of the institution and were only allowed to see their child during visiting hours. Arsenian started off with two groups: the Alone-group which consisted of sixteen children entering the strange situation alone, and the Mother-group which consisted of eight children who were accompanied by their mothers (or, in cases where the mothers of the children worked elsewhere in the institution and were not available, by a 'substitute' mother or a nursery helper) when placed in the strange room. Six children from the Alone-group were on later trials accompanied by their mother and so became the Alone-Mother group, and five children from the Mother-group were on later trials left alone in the experimental room and became the Mother-Alone group. The children were observed during ten or eleven trials consisting of five minutes in the strange room on alternate days. If they were accompanied by their mother or substitute, "the adult sat near the entrance to the strange room and was instructed to remain as impassive as possible" (Arsenian, 1943, p. 229).

All behavior of the children was classified into five categories, three of them indicating goal-directed and adaptive behavior (play, locomotion, talking), and two of them indicating signs of distress (crying, and "autistic gestures" (cf. Krout, 1935) like thumb-sucking, waving arms, stamping feet, etc.). The average duration of each type of behavior was determined. Children in the Alone group spent most of the first four trials crying and engaging in autistic behavior, but the children stopped crying in later trials. In the Mother group, adaptive behaviors dominated and at all times they showed more adaptive behavior than children from the Alone group. The children showed different patterns of approach and withdrawal activity. Arsenian eventually distinguished ten different patterns of behavior (from less to more adaptive: nonmotile withdrawal and crying, agitated movement, retreat with crying, attack, regressive encapsulation, nonmotile withdrawal without crying, encapsulation in play, approach with conflict, and free approach) and continued to rate the ten patterns on a security scale ranging from -5 to +5. Using these scale values, Arsenian computed security scores for the children: "Security of any child on a given trial was found by multiplying the scale-value of each pattern which he displayed by the percentage of time during which he exhibited

it" (Arsenian, 1943, p. 237). Average scores for the Mother group and the Alone group were computed and it was found that children in the Mother group behaved much more securely, and that security increased over time in both groups – security indicating specific behavior in context, not a specific mother-infant relationship. Of course, there were enormous individual differences. Lewin's influence was clearly visible when Arsenian stated that "insecurity is formulated as a function of the unfamiliarity, or unstructuredness, of the environment in relation to the child's feeling of power in it" (ibid., p. 248).

It is clear that Arsenian introduced important techniques and notions into the study of a strange situation's effects on children. She specifically chose a strange room and the removal or introduction of a mother or caregiver to study their effect on children's feeling of security. She rated the behavior of the children in the strange situation on a ten-point scale, and translated the behavior into a degree of security. However, unlike Ainsworth would do two decades later, Arsenian did not classify child behavior in terms of attachment patterns, nor did she explicitly study exploration or pay attention to the reunion with the mother (as Shirley had done).

Even though the studies of Shirley and Arsenian were mentioned on numerous occasions during the forties and fifties in reviews and articles discussing a diversity of topics (motivation, curiosity, group dynamics and methods of research, to name but a few) and authors expressed the need for a test that could aid in diagnosis of security of personality, this period did not see many researchers conducting strange situations of their own. An exception was Glen Heathers (1954), who partly replicated and tried to improve on Shirley's 1942 study. As part of the Fels Longitudinal Study, a child development study started in 1929 in Ohio and designed to study physical growth, maturation and psychological development, Heathers wanted to create a measure of emotional upset in children during a "novel social situation" (Heathers, 1954, p. 147) in order to relate this measure of upset to measures of social adequacy in school play, and to see if there was a relationship between measure of upset during the novel situation and certain aspects of home atmosphere and maternal behavior. The subjects were 31 two-year-olds. Heather's strange situation consisted of the child being parted from the mother at the door of their home, and taken by a stranger (the Trip Observer) to a strange car that would take him to nursery school at the Fels Research Institute for the first time. The procedure was repeated for the next four days, to measure adjustment. The Trip Observer filled in an eighteen-item behavior checklist (compared to the eight-step behavior rating scale Shirley had used) to make the record of upset responses "more specific and more objective" (ibid., p. 148). Next, the child was observed during play at the nursery school and behavior scored on 14 categories, paying attention to types of play activities and "various forms of dependent and independent responses" (ibid., p. 151). Prior to the first trip to nursery school, a home visitor conducted a two-hour visit

to the child's home to observe mother-child interaction and to interview the mother about her child's experiences and behavior. The Fels Parent Behavior Rating Scales were used to measure harmony in the home, sociability of the family, maternal warmth and maternal indulgence. Strict habit training was less en vogue now; the atrocities of World War II had suggested that unconditional obedience may not be the best parental goal and paved the way for the more permissive attitude exemplified by Benjamin Spock's *Baby and Child Care* (Beekman, 1977, p. 195). The results of the Fels study showed a positive correlation for trip upset and social insecurity or inadequacy in school play. No relation was found between trip upset and maternal indulgence, but Heather found home influences and maternal warmth to be associated with low trip upset. However, correlations were generally low and Heather concluded that "much more extensive observation of home influences would be required to provide adequate data for testing the relations between the child's experiences at home and his behavior in situations outside the home" (ibid., p. 157).

Seventeen years after publication, Arsenian's study was for the first time discussed at length in an overview of techniques used to study the behavior of children in the lab by Bijou and Bear (1960). They gave a detailed one-page description of her setup and concluded that

> the technique of this study seems to manipulate an important class of variables for this (and older) age ranges. The response measures used by Arsenian are broad and general (appropriate for an initial investigation); a refinement of these, and a wide use of many other responses and tasks, should prove of great significance in experimental investigations of these children (Bijou & Bear, p. 171).

The next researcher to pick up on Arsenian's study was Ainsworth.

HISTORY OF THE SSP

Mary Ainsworth wrote her dissertation in 1939 (Salter, 1939) under the guidance of William Blatz. It is well known that Ainsworth's interest in what we now call attachment stems from Blatz's teachings. Blatz, often referred to as the 'Doctor Spock of Canada' (Wright, 1996), was the first director of the Institute of Child Study at the University of Toronto, and had started his research career by studying children in the 1920s and 1930s in a nursery school especially set up for the purpose. A controversial figure in his time, he denounced authoritarianism and punishment, and promoted freedom for children so that they would learn from experience. His involvement as Educational Consultant for the Dionne quintuplets from 1935 to 1938 was afterwards viewed as unfortunate. The quints, born in 1934, were separated from their family by the state to be raised and studied by experts. Paying visitors could watch the children from behind a one-way window, which generated millions of dollars for the Canadian

state. The quints, however, were just one of Blatz's many projects and in the end he became best known for his security theory on which he lectured for years. A written version of the complete theory had to wait until his last book, *Human Security* (Blatz, 1966), which was published posthumously and was based on tape recorded notes.

According to Blatz, a child starts off having to depend on his parents. If the child feels certain the parent is going to be there for him, no matter what, the dependence is 'secure' and the child feels comfortable to go and explore. The exploration will result in development towards a state of 'independent security', although Blatz admitted in his later writings that independent security can probably never be reached completely and that a form of 'mature secure dependency' on friends and/or a partner is possibly the highest achievable goal. In the meantime, some people will remain 'immaturely dependent' or rely on defense mechanisms (such as denial, dissociation, rationalization or regression) in order to deal with feelings of insecurity. Ainsworth's dissertation was fully based on Blatz's security theory. She designed an instrument to measure security in (young) adults by using extensive questionnaires and comparing them to case histories derived from autobiographies. After her dissertation she kept expanding and improving on this instrument until 1958 when she published a much more developed version of her questionnaires (Ainsworth & Ainsworth, 1958; Van Rosmalen, Van IJzendoorn, & Van der Veer, 2014).

Ainsworth was the first, but by no means the only one attempting to measure Blatz's concept of security. In the years that followed many other members of Blatz's team in Toronto designed measures for security. Correspondence shows that Ainsworth was aware of these developments while working at Johns Hopkins, but she later stated that members of the Blatz team "went on to construct their own [tests] either for children or for infants, along lines that did not really fit with my interpretation of Blatz's security theory" (Ainsworth, 1988, p.6). Betty Flint designed the Flint Infant Security Scales for children from 3-24 months (Flint, 1959; 1974) and Ainsworth briefly discussed Flint's study in her paper on the effects of maternal deprivation (Ainsworth, 1962). She also used the Flint Infant Security Scales at the start of the Baltimore study (see below), but discontinued using them (together with some other measures) after the first few months - the paper work was too time-consuming, and the Flint scales turned out not to be discriminating among the babies of the sample. (Isaacson, 2006).

Having obtained her doctoral degree, Ainsworth spent several years lecturing at the Psychology Department of the University of Toronto before joining the Canadian Women's Army Corps in 1942, where she attained the rank of major. During her four years there, she held different positions in personnel selection, which involved clinical work like administering tests, conducting interviews, taking histories, and counseling. She returned to the University of Toronto in 1946 to work as assistant professor. To prepare herself for the teaching of a class on personality assessment she studied the

Rorschach technique and the Thematic Apperception Test. A few years later she co-authored a book on the Rorschach test with Bruno Klopfer (Klopfer, Ainsworth, Klopfer, & Holt, 1954) and continued to use the test to validate her security questionnaires (Van Rosmalen, Van IJzendoorn, & Van der Veer, 2014). Thus, the key components of Ainsworth's thinking (the parent as a source of security and as a base from which to explore the environment) and her skills and experience in the area of personality assessment, were already present when she arrived in London.

Ainsworth had followed her husband to London in 1950 and started working with John Bowlby at the Tavistock Clinic, researching the effects on young children of being separated from their mother. Ainsworth assisted James Robertson in analyzing the detailed field notes he made while observing young children during separations, for instance in hospitals or in institutions (Bretherton, 1992; Van der Horst, 2011). By doing so she gained a great deal of experience in the analysis of observational data which she was able to use in the field research she conducted several years later, when she followed her husband again, this time to Uganda. There, in 1954-55, Ainsworth studied normative development, mother-infant interaction, and the development of attachment. She did this by observing 26 mothers with their children at their homes for a few hours every two weeks, and conducting interviews with the mothers (Ainsworth, 1967). When studying these mother-child dyads, she saw increasing evidence for Bowlby's claim that attachment is based on interaction rather than on the mother providing food and other basic needs (which was the idea supported by psychoanalysts). Ainsworth left eleven years between finalizing her data collection in Uganda and publishing the book about the study. She commented that

> the full significance of what I observed and recorded in my field reports emerged only gradually, not merely in the process of analyzing my observations, but also in the course of reading, discussions with others interested in mother-infant interaction, and further research into the early development of attachment (Ainsworth, 1967, p. ix).

One of the places where she discussed the findings of her Uganda study was at the Tavistock Study Group on Mother-Infant Interaction in London in 1961, organized by Bowlby. The reception of her work quite exceeded her expectations as she had not "expect[ed] experts to find it so original and stimulating" (Ainsworth in a letter to Leonard Doob, 12 October 1961). She proposed specific criteria to determine if the infant had "formed an attachment to his mother as a special person" that went beyond those of Bowlby (Ainsworth, 1963). Ainsworth found that only looking at crying, following and clinging as reactions to (threatening) separation, as Bowlby (1958b) had proposed, was not enough to establish the strength of attachment. Contrary to popular belief according to which intensity of attachment could only be measured by the intensity of protest by the child in separation situations, Ainsworth stated:

> Yet to judge the strength of the infant's attachment to his mother solely in terms of the intensity of behavior reflecting separation anxiety would seem to be a mistake; some of the infants in this study who seemed most solidly attached to their mothers displayed little protest behavior or separation anxiety, but rather showed the strength of their attachment to the mother through their readiness to use her as a secure base from which they could both explore the world and expand their horizons (Ainsworth, 1963, p. 103).

After exhaustively examining her field notes Ainsworth came up with the following types of attachment behavior: differential crying, smiling, vocalization, visual-motor orientation towards mother, crying when mother leaves, following, 'scrambling' over mother, burying face in mother's lap, clinging, greeting by lifting arms, clapping hands, or approaching through locomotion, and exploration from mother as a secure base.

When describing the role of the mother as a secure base, or 'haven of safety', from which to explore the world, Ainsworth was clearly inspired by Blatz and Arsenian, as we have seen before, but also by Harlow (1958), who in turn had also been inspired by Arsenian. All three had reported that the baby used the mother as a secure base from which it would go out and explore, ready to face external threats without panic. Harlow, who was also present at the Tavistock Study Group meetings, conducted research with rhesus monkeys and described how the mother or mother surrogate acted as a secure base for the baby monkey in a strange situation. During the so-called 'open field test', the baby monkey was put in a strange environment (a room measuring six by six feet containing some stimuli), and Harlow described how the monkey would rush to the mother surrogate as soon as possible and cling to her. After a few sessions, however, the baby would let go of the mother and start to venture out more and more, using her as a "base of operations" (Harlow, 1958, p. 679). The monkey would "explore and manipulate a stimulus and then return to the mother before adventuring again into the strange new world" (ibid., p. 679). However, if the (surrogate) mother was not present in the room, the monkey would remain in one spot, in a crouched position, and show no exploratory behavior whatsoever (Van der Horst, LeRoy, & Van der Veer, 2008).

When the Uganda book finally appeared in 1967, Ainsworth had gone further than just describing the development of attachment in general and had divided the children into three attachment groups, or classifications: secure-attached, insecure-attached, and non-attached. Classifications were based purely on extensive observations in the home. Ainsworth was now confident that a close attachment could develop simultaneously with increasing competence and independence. She again pointed out, as she had done in 1961 at the Tavistock Study Group meeting, and in her article published in 1964 on patterns of attachment behavior, that it was the insecure child who would cling to his mother, refuse to leave her, and for whom maintaining

interaction from a (small) distance, even part of the time, wasn't enough (Ainsworth, 1964; 1967).

In the meantime, while still analyzing the data for the Uganda book, Ainsworth had started the Baltimore Study in 1963. She and her colleagues observed mother-infant interaction in 26 families by following infants from three to 54 weeks during three-weekly home visits lasting four hours each. The study was initially intended as a replication of the Uganda study and its aim was to investigate the development of patterns of attachment and to systematically observe maternal behavior (from which the construct of maternal sensitivity would later be developed). At the end of the first year, a large amount of data had been gathered regarding the behavior of the children in the home situation. As the study developed, it became clear to Ainsworth that apart from observing the infants in the home environment, it was necessary to include an observation in an experimental setting. She wanted to assess the child's use of the mother as a secure base outside the home environment, and she felt the need to base her research on measurable information in order to make her observations acceptable within a very behaviorist environment (Silvia Bell, personal communication, March 5, 2013). Thus, Ainsworth together with her assistant Barbara Wittig, designed the Strange Situation Procedure.

However, at that time they were by no means the only ones studying the behavior of children in a strange situation. In the middle and late sixties we see a sudden wave of experiments with children in strange situations, many of them inspired by Shirley, Arsenian and/or Harlow.

STRANGE SITUATIONS IN THE 1960S: PARALLEL DEVELOPMENTS

World War II had stirred the interest in the consequences of mother-child separation and psychoanalysis had now reached the summit of its popularity. Bowlby's WHO report *Maternal care and mental health* (1952) was the first attempt to chart out the adverse effects of maternal deprivation. Now, more than ever, perhaps, it was believed that the children's mental and social problems were caused by the social environment and, specifically, by the nuclear family. Researchers went to great pains to discover the social origin of children's problematic behaviors.

As part of a psychoanalytically oriented, longitudinal study designed by John Benjamin, Katherine Tennes and Esther Lampl (1966) reported on the observation of 27 infants aged between six and 36 months in a strange situation, with the aim of investigating "the contribution of the instinctual drives, both libidinal and aggressive, to the intensity of infantile separation anxiety as determined by fear of object loss" (p. 426). The children, in the company of their mothers and an examiner, were observed in a laboratory setting whilst playing, doing developmental tests, and interacting socially

with the examiner. After about 45 minutes the mother was requested to leave the room and stay away for 10 to 15 minutes. The distress of the child was rated on a five-point scale, and the experimenters were interested in the infant's way of dealing with his anxiety. In the first instance it was left to the child to reduce his anxiety by himself. Failing that the examiner would try to offer physical comfort, and if that didn't work an attempt was made to distract the child by offering him a toy. The defense reactions that were observed were described at length and included: a 'regressive attempt at kinesthetic restitution of the missing object' (stop moving and not looking at the stranger); 'active mastery of the environment' (attempts to follow the mother); 'inhibition of motor activity' (decrease in activity and motility); 'use of inanimate objects' (offering a toy to the stranger, holding on to a toy, or banging or throwing a toy). Even though their explanations were all strongly psychoanalytically orientated, Tennes and Lampl reached the same conclusion Ainsworth had presented in 1965 (Ainsworth & Wittig, 1969), i.e., intensity of separation anxiety cannot be used as the sole criterion of the child's attachment to the mother:

> The level of libidinal investment of both partners has no predictive value for the intensity of infantile separation anxiety. Infants who lack a libidinal investment in the mother do not have separation anxiety, but some children with a very high libidinal investment in the mother also fail to develop separation anxiety (Tennis & Lampl, 1966, p. 435).

Berg, Stark, and Jameson (1966) were concerned that the behavior of children, as they were being observed with their mothers in a child psychiatric clinic, was influenced by the presence of the interviewing doctor. They wanted to test objectively the effect of the presence or absence of a stranger on children's attachment and exploratory behavior and observed 17 pre-school children. The setting (see Figure 1) bore a great resemblance to the setting of the SSP: the child was placed in a playroom with his mother for two subsequent periods of 20 minutes, during one of which a stranger was present. The room contained some toys, and the mother was asked to stay seated and to try not to influence the behavior of the child. A four-foot radius circle was drawn on the floor around the mother's chair, and the amount of time the child spent inside the circle during each period was measured. Observers also noted certain types of behavior of the child, like physical contact with mother, movements in the direction of the toys, approaches to mother, speech, finger-sucking, eye-rubbing, rhythmical movements of the limbs, and communication with mother or stranger. The results allowed for the 17 children to be divided into three groups according to their reactions to the stranger: group A, consisting of seven children, showed more proximity and contact seeking towards their mothers in the presence of the stranger; group B, consisting of four children, didn't necessarily seek proximity but showed severe shyness by hardly speaking in the presence of the stranger, and group C, consisting of six children, did not seem to be bothered much by the stranger's presence. In this study, maternal personality was taken into account by asking the mothers to complete the Eysenck Personality

Inventory, the results of which were compared to the behavior of the child. The study showed that a higher mean maternal neuroticism score was related to more proximity

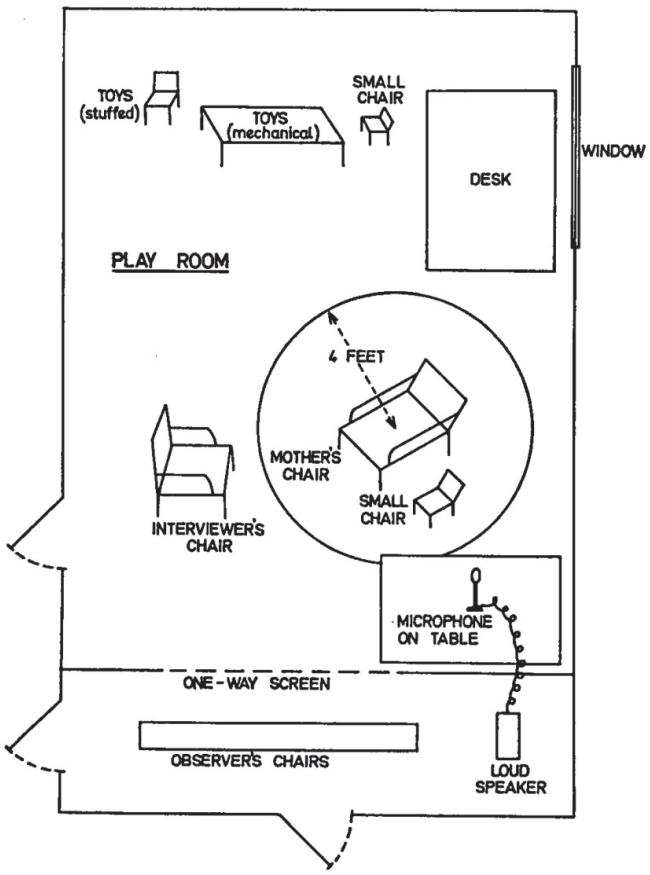

Figure 1: Setting of Berg, Stark and Jameson (1966)

seeking behavior of the child in the presence of the stranger. However, the authors hesitated to draw any strong conclusions: some measures of behavior "were insufficiently precise to distinguish those children who were more obviously affected by the stranger's presence" and some children "were apparently unaffected by the stranger and even showed more exploration and less attachment when she was there" (Berg et al, 1966, p. 249).

A couple of totally different and, according to today's standards rather horrifying studies were published by Miriam Rosenthal in 1967, who wanted to test "the suggestion made by Harlow that some form of dependency behavior toward a mother might reduce the threatening aspects of unfamiliar, novel situations, thus allowing exploratory behavior to take place" (Rosenthal, 1967b, p. 357). She manipulated anxiety levels in 64 nursery-school girls aged three to five years after placing them in a strange environment, and measured their 'dependency' by looking at attention seeking and proximity seeking behavior (seeking positive or negative attention, seeking praise and approval, seeking help, seeking proximity or being in physical contact with the adult). In her first study, the child's dependency behavior towards the mother was compared with the dependency behavior towards a stranger (Rosenthal, 1967a). In her second study, she looked for effects of the strange situation and level of anxiety on dependency behavior (Rosenthal, 1967b). The strange environment was a room in an office building filled with toys and typical play-school material (see Figure 2). The child was taken into the room by an experimenter, while the mother or stranger were already present in the room, seated at a desk behind a curtain. The adult was instructed not to initiate any interaction with the child, but if necessary to respond without rejecting it. Sessions lasted for 30 minutes. In the low-anxiety condition the room was decorated with pictures of smiling faces, and a tape recording of children's songs was heard from the room next door. In the high-anxiety condition, however, the room looked different:

> The child, on entering the room, faced a slow-burning alcohol lamp standing on a stainless steel tray. Next to it was a pair of scissors, a white paper tissue, and a pencil. The pictures of the smiling faces were replaced with a group of sad faces (Rosenthal, 1967a, p. 123).

The children's songs were replaced by sounds of banging on a metal object, a child crying, and a high-pitched shriek, coming from behind a red door, next to which the lamp was positioned. Then, after about twelve minutes

> and following a loud continuous shriek, the red door opened very slowly (the experimenter waited until the child was looking in that direction) and a hand in an arm-length black glove reached slowly in, put out the lamp and withdrew, closing the door once more. Within two or three minutes a crying sound was heard (ibid., p. 123).

Unsurprisingly, proximity seeking increased in frequency in the high anxiety situation (which would probably scare the wits out of the average adult). Frequency of total dependency behavior towards the mother was significantly higher than towards the stranger.

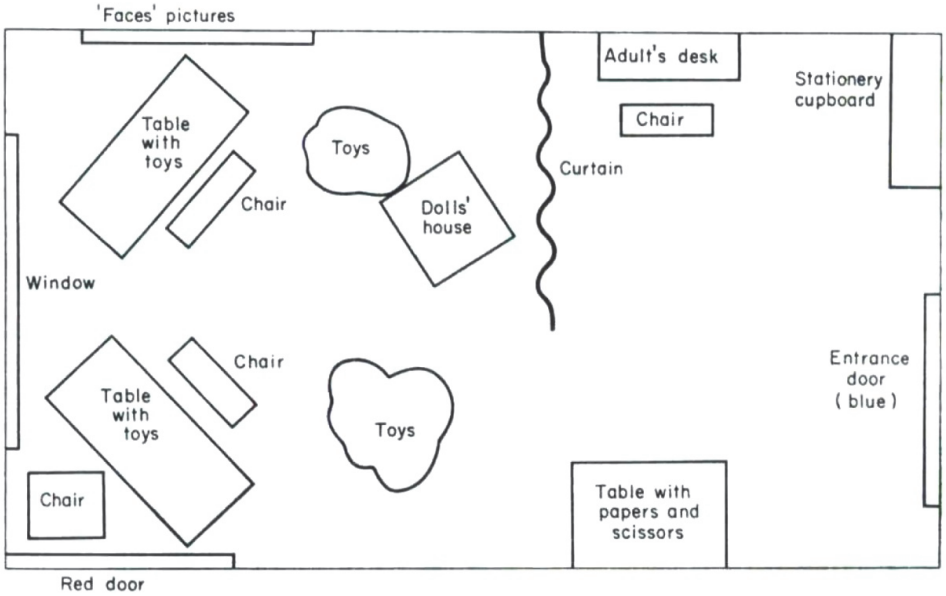

Figure 2: Setting of Rosenthal, 1967a

Roberta Collard (1968) conducted a much milder strange situation study, but from a different perspective: measuring the effect of birth order on reaction to a stranger in a strange situation. Presuming that later-born children would have siblings around them a lot of the time and that their mothers would be less protective and anxious than they had been with their first child, later borns were expected to show less fear. Collard observed 36 infants aged 38 to 56 weeks who were sat on their mother's lap at a testing table, where a stranger took position opposite the baby and offered it a toy. Response latency before picking up the toy was measured, as were exploratory and play responses, and positive or negative social responses. Collard found that first-born infants indeed took longer to pick up the toy than later-born infants. The social responses towards the stranger also differed: later borns showed more positive social responses, like laughing and smiling, than did first borns.

F.N. Cox and Dugal Campbell (1968), uneasy about the lack of evidence on which to base the decision to let a mother be present or not during experiments with children, decided to partly replicate Arsenian's study. They conducted two experiments: one consisting of 20 mothers with children aged between 13 and 15 months, and one consisting of 20 mothers with children aged between 23 and 37 months. Mother and child were taken into an observation room with a chair for mother in one corner, and a pile of four toys in the corner diagonally opposite. Half of the mothers (the

experimental group) would stay in the room for four minutes, leave the room for four minutes, and return for the last four minutes. The other half of the mothers (the control group) would stay in the room for the full 12 minutes. Observers noted the incidence of eight behaviors of the child: touching mother, holding mother, speech, movement, play, touching objects, placing object in mouth, and crying. According to the authors, these results demonstrated that "when young children play in a strange situation their behavior is affected by the presence or absence of their mothers. Absence of the mother produces a decrease in talking, movement, and playing with toys" (p. 129).

Conrad Schwarz (1968), inspired by Arsenian (1943) but also by the (at the time still unpublished) studies of Ainsworth and Wittig (1969) and Rheingold (1969), carried out his own version of the strange situation. In the introduction he declared: "there appears to be no experimental evidence which bears directly upon the existence of a unique role for attached individuals as inhibitors of distress in children over three years." (Schwarz, 1968, p. 314). The subjects were 16 children aged four, who were taken to a room with their mother by a stranger. The stranger started playing games with mother and child. After about five minutes the experimenter entered and asked either the stranger to step out of the room, or the mother. After the child was left with the mother or the stranger, the fear stimulus was activated: a remotely controlled 10 inch tall mechanical toy gorilla, hidden in a box, was made to beat its chest, walk out of the box, and beat its chest again (cf. Harlow & Zimmerman, 1959). Observations included the child's facial expressions, position in the room (the room was marked off in 18 inch squares), and visual orientation. Contrary to what was expected, results showed more observed fear in the presence of the mother. In company of the stranger the children looked away from the gorilla sooner and appeared to focus on the toys. Schwarz (1968) suggested that the mother's presence "may have facilitated the *communication* and *expression* of fear. Being left in a strange room with a strange person may have induced a general inhibition of motility and emotional communication" (Schwarz, 1968, p. 321, original italics).

In 1969, the same year Ainsworth published the data on the SSP for the first time, Harriet Rheingold published two studies on the behavior of infants in a strange environment, and the effect of the presence or absence of the mother. The data on these studies, just like Ainsworth's data on the SSP (Ainsworth & Wittig, 1969), had already been presented in 1965 during the fourth Tavistock Study Meeting. Ainsworth and Rheingold knew each other quite well, and even though they designed and conducted their studies independently and were guided by different theories, they were aware of each other's work, and were inspired partly by the same studies (e.g., Arsenian, 1943; Bayley, 1932). Rheingold's study covered several experiments in which the effect of a strange environment on the behavior of ten-month old children was observed:

"Although the effect of a strange person upon the behavior of human infants has often been studied . . . the effect of a strange environment has less often been investigated" (Rheingold, 1969, p.137). In the first experiment, the strange environment was a totally empty room, in the second one this empty room contained some toys, and in the third one the room contained a stranger. Each experiment consisted of four or five trials lasting two to three minutes each, and for half of the subjects the mothers were present in the first few trials, while for the other half of the subjects the mothers were present in the last few trials (much like Arsenian's Mother-Alone and Alone-Mother groups). The floor of the room was divided into squares (as, incidentally, was the floor of the room Ainsworth would use for the SSP during the first few years) and for the trials with the mother or the stranger they were instructed to sit in a specific square in the room and not to talk or play with the child. It was allowed, however, to look at the child, to smile or to comfort him. Observers recorded vocal responses and locomotor activity. Rheingold concluded that a strange environment inhibited exploratory behavior and evoked emotional distress. Presence of the mother, however, supported exploratory behavior, prevented crying, and evoked non-protest vocalizations. Putting toys in the room did not make much difference, whereas putting a strange person in the room caused distress and inhibited physical activity. Children whose mothers had been with them in the strange room during the first few trials were slightly more at ease in the later trials without their mother than were the children who had started off on their own. Children who were in the strange room alone during the first few trials remained more distressed even when their mothers were present during subsequent trials.

In her next study, Rheingold (Rheingold & Eckerman, 1969) again looked at exploratory behavior of ten-month-old infants in a strange environment, this time paying particular attention to "the process by which the infant detaches himself from his mother and her near environment" (Rheingold & Eckerman, 1969, p. 272). In this study, the mother was always present and seated in a small room, together with the child. The small room allowed access to a larger room: the strange environment (see Figure 3). Sometimes this larger room was empty, sometimes it contained toys. The main difference with Rheingold's previous study, in which the children were placed in the large room by the experimenter, was that this time the infant started from his mother's side and could decide himself whether to enter the strange environment or not. All 24 children in the study left their mothers and moved into the strange environment, regardless of whether there were toys in the room or not. Comparing her two studies, Rheingold remarked that in the first study the results were "attributed to the strangeness of the room. The present results suggest that it was not solely the physical properties of the room but the additional conditions of being placed and left alone that provoked the distress and inhibition" (Rheingold & Eckerman, 1969, p. 281). It was noted that apart from entering the strange environment, all children also returned to the small room, and often re-entered the large room. According to

Rheingold, this to-ing and fro-ing may well be illustrating the child's exploration from the mother as a 'secure base' (Ainsworth, 1963), or 'a base of operations' (Harlow, 1958).

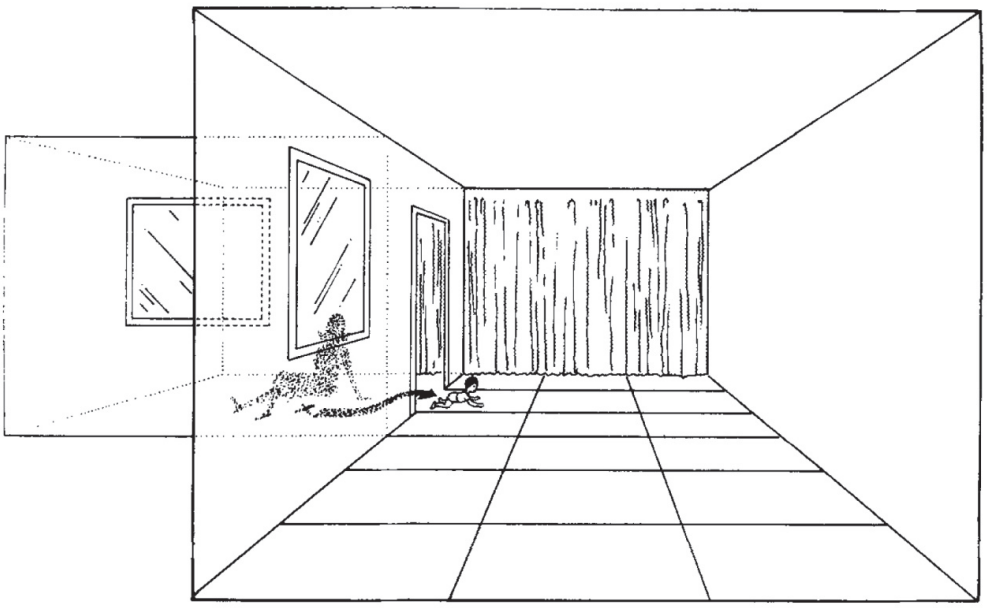

Figure 3: Setting of Rheingold and Eckerman, 1969

Before turning to the first publication on the SSP, let us summarize what these strange situation studies conducted in the mid and late sixties have in common that makes them different from Ainsworth's SSP. To start with, all these studies were normative and looked at the general behavior of children as a group, finding that children showed more proximity seeking behavior when they found themselves in scary situations, that they used the mother as a secure base from which to explore, or that they usually preferred their mother over a stranger. The next important difference is that most of these studies attributed the behavior of the child directly to the situation and not to past mother-child interactions. Reasons given for a child behaving in certain ways were that the child was put into a strange environment, a stranger was present, mother was present or not, or the child felt threatened by fear inducing stimuli. Except for two studies (Berg, Stark, & Jameson, 1966; Tennes & Lampl, 1966), and unlike Shirley and Arsenian before them, these researchers did not take the relationship between mother and child into consideration. And lastly, even though Berg and

colleagues divided the children into three groups based on their reaction to the stranger, none of these studies tried to classify the children by translating the behavior into a degree of security like Arsenian had done. In other words, many researchers from different theoretical backgrounds experimented with 'strange situations' to answer various research questions but none of these procedures developed further into an instrument measuring security or attachment. In addition to the aforementioned differences, this could partly be due to the fact that they did not fit into a larger research tradition or paradigm.

ARRIVAL OF THE SSP

Ainsworth presented her findings on the SSP for the first time in 1965, but they were not published until 1969 (Ainsworth & Wittig, 1969). The article was part of the longitudinal Baltimore study. When the child was 12 months old, each infant-mother pair was observed in a final session, the Strange Situation Procedure. Special attention was paid to three aspects: firstly, Ainsworth wanted to look at how the infant would use the mother as a secure base from which to explore the surroundings, since she considered this to be one of the most important criteria of a healthy attachment. Secondly, Ainsworth was interested in the child's response to a stranger. At home, the children had been generally comfortable in the company of strangers, but nothing was known of the infants' behavior in unfamiliar surroundings. Thirdly, Ainsworth wanted to look at the child's response to the mother's departure and return. Again, the children had been mostly comfortable with their mother's departure from the room when at home in familiar surroundings, but Ainsworth was interested in their reactions when in unfamiliar surroundings. Ainsworth stated that:

> The situation was designed to be novel enough to elicit exploratory behavior, and yet not so strange that it would evoke fear and heighten attachment behavior at the outset. The approach of the stranger was gradual, so that any fear of her could be attributed to unfamiliarity rather than to abrupt, alarming behavior. The episodes were arranged so that the less disturbing ones came first. Finally, the situation as a whole was intended to be no more disturbing than those an infant was likely to encounter in his ordinary life experience (Ainsworth, 1964, p. 53).

Ainsworth also hoped that this study would provide evidence for her notion that insecurely attached children are the ones that show a high level of anxiety in a minor separation situation, and that securely attached children would not necessarily show this by their intensity of protest when separated from their mother, as for instance Schaffer and Emerson (1964a) maintained (Ainsworth & Wittig, 1969).

Fourteen infants were put through the strange situation procedure and were rated on the following behavioral items: exploratory behavior, visual orientation, crying,

responses to mother leaving the room, responses to mother's return, responses to the stranger's entrance, responses to being picked up (by the mother or by the stranger), and responses to being put down (by the mother or by the stranger). In agreement with Ainsworth's (1963) findings with the Ganda infants, the results, when related to the infant's behavior at home, and taking into account his developmental history, did support the hypothesis that the child's ability to use his mother as a secure base from which to explore the environment is an important part of the child's attachment to his mother. Furthermore, the results of the responses to separation in the strange situation allowed Ainsworth to divide the babies into three tentative groups: Group A, consisting of four children that showed very little disturbance upon separation (the classification that would later develop into insecure-avoidant); Group B, consisting of six babies who were clearly upset by the separation, but at the same time managed to adapt (the securely attached children), and Group C, consisting of four babies that were also clearly upset, but showed distinct maladaptive behavior (the classification that would later develop into insecure-ambivalent). Whereas in *Infancy in Uganda* Ainsworth (1967) had still used the classification 'non-attached', she now stated that "the development of attachment is not easily discouraged; it can be distorted, but it takes more deprivation than is represented in this sample to discourage its growth altogether" (Ainsworth & Wittig, 1969, p. 136).

In Ainsworth and Bell's (1969) report on patterns of mother-infant interaction in the feeding situation the final classification system was published for the first time. However, since the focus of this paper was on the effect of feeding practices Ainsworth stated in a footnote that this classification system, based on a sample of 56 infants, "will be described in detail in a future publication".

Ainsworth and Bell (1970) then continued to publish a normative study on the SSP which described behaviors characteristic of the sample as a whole during each of the episodes instead of describing the individual differences reported by Ainsworth and Wittig (1969). The publication started with a summary of the ethological and evolutionary viewpoints of attachment, which in effect were at the base of Ainsworth's SSP, and was followed by an explanation of attachment and attachment behavior. The study itself consisted of observations of 56 subjects, 23 of which were part of the Baltimore study, and 33 from a study done by Bell (1970). The main findings were three-fold: first, the infants used the mother as a secure base from which to explore the strange environment. Second, as the mother left the room, exploration lessened or stopped altogether, and the infant showed proximity and contact-seeking behavior. Third, when the mother returned, the infant kept showing more proximity and contact-seeking behavior, and exploration remained at a lower level than before the mother left the room. About a third to half of the sample showed contact-resisting behavior to some degree after the first or second reunion. Ainsworth pointed out that these findings were

in accordance with findings of other experimental studies, clinical studies and field studies. Five propositions were given for a comprehensive concept of attachment:

1. Attachment is not coincident with attachment behavior;
2. Attachment behavior is heightened in situations perceived as threatening;
3. Attachment behavior is incompatible with exploratory behavior;
4. After prolonged absence from the object of attachment, attachment behavior may diminish, but is likely to reemerge;
5. Attachment relations are qualitatively different from one attached pair to another.

Based on these propositions, Ainsworth and Bell put forward their argument for the measure of quality of attachment as opposed to quantity:

> The qualitative differences, together with the sensitivity of attachment behavior to situational determinants, make it very difficult to assess the strength or intensity of an attachment. It is suggested that, in the present state of our knowledge, it is wiser to explore qualitative differences, and their correlates and antecedents, than to attempt premature quantifications of strength of attachment (Ainsworth & Bell, 1970, p. 65).

The detailed description of the final classification system of the SSP was published one year later (Ainsworth, Bell & Stayton, 1971). The paper reported on the same study as the normative paper (Ainsworth & Bell, 1970), but this time the authors looked at individual differences. Comparing the extensive home observations and developmental history of the infant-mother relationship with the infant's behavior during the SSP made it possible to clearly define the different attachment categories. To test the new classificatory system, an additional comparison was made between the attachment-exploration balance at home, where the infants were categorized into five groups according to the ability of the infant to use the mother as a secure base from which to explore the world, and the infant's SSP classification. Ainsworth found "an impressive degree of congruence between a baby's response to his mother in the strange situation and the quality of the attachment-exploration balance at home" (Ainsworth, Bell & Stayton, 1971, p. 39).

Next, Ainsworth compared maternal behavior with the attachment classifications (cf. Berg, Stark & Jameson, 1966). Maternal behavior had been rated during home observations and was divided into four dimensions: acceptance-rejection, cooperation-interference, accessibility-ignoring, and sensitivity-insensitivity. There was no doubt that mothers of group B babies were significantly more sensitive, but Ainsworth hoped to be able to identify what distinguished A and C mothers by studying the other three dimensions. During the last quarter of the first year, the four dimensions were rated separately for each home visit and results indicated that group A mothers were significantly more rejecting than group C mothers. Ainsworth herself was pleased with the results:

> In a previous publication (Ainsworth & Wittig, 1969) we reported the strange-situation findings for the first 14 subjects in our sample, and our impression that individual differences were related to differences in style of mother-infant interaction throughout the first year of life. In view of the expensive and very time-consuming nature of longitudinal research, it is an attractive notion that one might in a 20-minute procedure obtain a reasonably reliable and valid assessment of the nature of the relationship that has developed between an infant and his mother (Ainsworth, Bell, & Stayton, 1971, p. 19).

This statement by Ainsworth provides a partial explanation of the success of her measurement procedure. If one believes with Bowlby and other attachment theorists that social problems such as juvenile delinquency and pilfering find their roots in inadequate mother-child relationships and if one hopes to identify suboptimal mother-child relationships in order to intervene in the family process and remedy the problems, the availability of a simple laboratory procedure to typify that relationship is indeed a godsend. For the first time, instead of conducting lengthy and repeated clinical interviews with mothers in the Child Guidance Clinic, instead of repeatedly paying costly visits to the homes of mothers and children, one could simply run the mother-child dyads through the lab procedure and identify the couples at risk.

CONCLUSION

In 1969, Ainsworth published her first study on the Strange Situation Procedure. She was, however, by no means the first researcher to look at the behavior of children in a strange situation. The first studies on this subject emerged in the 1930s. When reviewing the relevant studies published from the 1930s to the early 1970s, however, we found nothing remotely like a linear progression. Quite the opposite: researchers were not aware of, or ignored, previous studies using a strange situation, or chose to change the previous setups to answer their own particular research questions. For instance, even though Shirley (1941; 1942), Heathers (1954) and Berg, Stark and Jameson (1966) focused on the mother-child relationship in a similar way Ainsworth did, Ainsworth never mentioned these studies in relation to the SSP. Some of the studies carried out in the 1960s had in common that they borrowed from Shirley and Arsenian, but again, researchers appeared to be unaware that similar research was being conducted elsewhere at around the same time. Most of the procedures discussed in this paper were not followed up, possibly, because they did not become imbedded in a research paradigm that generated new research questions with potential social and clinical implications.

Comparing all the strange situation studies available from the beginning of the 20th century until the first publications on Ainsworth's SSP, we argue that the latter was different for a number of reasons. Firstly, the SSP was based on a blend of Blatz's security theory and, more importantly, Bowlby's attachment theory (which she helped develop) and offered explanations for the observed behavior from an evolutionary and

an ethological standpoint. This gave Ainsworth's instrument a solid backbone. Secondly, she was one of the few to focus on parent-child relationships instead of traits or behaviors of the child. Whereas most studies conducted in the 1960s attributed the behavior of the child to the presence of the stranger or the strange surroundings, Ainsworth presumed the child might feel more or less secure as a result of his relationship with his caregiver. Thirdly, the SSP was not a normative study but gave information on developmental differences between individual children. And last but not least, the SSP allowed researchers to infer or classify the child's attachment relationship with the mother from the behavior of the child in the lab. For the first time researchers had at their disposal a simple and time-saving instrument with which to typify the attachment relationship of individual children with their caregivers. This satisfied the need to identify problematic development at an early stage. Or, in the words of attachment researcher Michael Lamb: "The Strange Situation procedure has become popular in part because of claims that Strange Situation behavior predicts important aspects of the child's behavior as much as several years later" (Lamb, 1984, p. 136).

In this contribution we have extended the historiography of attachment theory and of the SSP in particular, and shown that Ainsworth was not the first, and certainly not the only one to observe the behavior of a child in a strange situation, with or without his mother. She was, however, one of the few who translated the behavior of the individual child into a degree of security or attachment. Supported by the strong connection with Bowlby's attachment theory and providing a quick and easy way to measure attachment, the SSP became the instrument of choice for many attachment researchers.

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