
How are the Processes by Which People Become Attached Influenced by Stage of Development?

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The current paper examines individuals' understanding of relationships with significant others in terms of the increase in complexity of tasks that is posited to occur in the Model of Hierarchical Complexity (Commons et al., 1998). We interviewed 8 to 10 year old children, and adults, about losses of attachment objects, including people, pets, objects, places, events and ideals. Statements that children and adults made about these attachment objects were scored using the Model of Hierarchical Complexity. It was found that children's statements were primarily scored as primary or concrete. Adults' statements ranged from primary to systematic, but were more often scored as abstract, formal and systematic (not primary or concrete). Illustrative examples of statements at each of the orders of complexity for both children and adults are provided. It will be important to extend these findings by examining whether the verbal behavior of individuals with respect to relationships is related to the kinds of relationships they appear to have.

Attachment theory, as proposed originally by Bowlby (1969) and Ainsworth (e.g., Ainsworth, Blehar, Waters, & Wall, 1978) conceived of attachment of infants to their caregivers as a biologically-based system. According to these theories, the most important aspect of attachment was that, as a result of an infant's experiences, the infant would develop a different quality or type of attachment. According to this research, the optimal type is called secure attachment. An infant who is securely attached will appropriately seek contact with a caregiver when upset, fearful or ill. Once consoled, such an infant will be able to get on with exploring the world. Other infants, given other kinds of caregivers, might develop different types of what has been called insecure attachment. Such infants might, for example, avoid and not tend to seek contact when distressed. Others might be resistant or ambivalent, both seeking contact and rejecting it. While the type or quality of attachment an infant developed (e.g., secure vs. insecure) was seen as related to the quality of care that infant received, the fact that an infant would become attached was seen as inevitable and universal, given almost any care environment.

Even if all people become attached, as postulated by Bowlby (1969) and Ainsworth et al. (1978), the processes that are involved in developing attachments both in infancy and beyond may differ. This paper examines possible processes by which humans of all ages may become attached. Attachment processes are those events that are involved in developing and strengthening the attachment behaviors at different stages and those processes involved in shaping which particular attachment behaviors

develop. The processes are discussed from the point of view of the developing infant or child. It is assumed that another set of processes is operating on those taking care of that child.

Beyond the Bowlby and Ainsworth theories discussed above, there have been two contrasting views of attachment that have been proposed. Both have proposed processes by which attachment comes about. The first is the social conditioning view of researchers such as Gewirtz (e.g., 1969, 1972, 1991). The second is the stage developmental view of Kohlberg (1969, 1991). In examining attachment processes, this paper takes a different view than the Bowlby-Ainsworth view. This view is more influenced by learning theory on the one hand, and cognitive developmental theory on the other.

Traditionally, learning and cognitive developmental theories have been seen as being in opposition. For example, traditional learning theory views most aspects of attachment as remaining constant over the life span, including the processes by which attachment takes place. Cognitive and moral developmental theories instead see fundamental changes taking place at each stage in life, even if the process of stage change may have commonalities. Commons (1991), however, synthesized the two theories, demonstrating that they share a number of notions with regard to attachment. First, both Kohlberg (1991) and Gewirtz (1991) see attachment as something that occurs over the lifetime, and is not confined to, nor primarily based upon, processes in infancy. A second commonality is that both theorists see attachment as a set of processes, not as traits such as "being securely attached." When examining these processes, Kohlberg and Gewirtz concentrate on stage-change and conditioning processes, respectively. Third, they share the notion that the attachment processes involve more behaviors than just seeking to be physically close to an attachment object. They examine a wide variety of behaviors that are directed toward individuals to whom someone is attached.

A Hierarchical-Complexity View of Attachment

This paper proposes an integration of some of the ideas from traditional learning theories and some from traditional cognitive developmental theories. A central part of this integration is embodied in the Model of Hierarchical Complexity, which is described in the Introduction to this issue.

In the view proposed here, there are two basic assumptions with regard to attachment processes. The first is that attachment processes operate throughout the life span (Gewirtz, 1976, 1991;

Greenberg, Siegel, & Leitch, 1983; Kahn & Antonucci, 1982; Kalish & Knudtson, 1976; Kohlberg, 1991; Lerner & Ryff, 1978; Levitt, 1991; Main, Kaplan, & Cassidy, 1985; Troll & Smith, 1976; Weiss, 1982). The second is that as individuals develop, different types of attachment processes will become important, although the old ones do not disappear.

The Model of Hierarchical Complexity provides a rationale for specifying the order of development of attachment processes. Which particular kinds of attachment processes will predominate depend on a number of factors. These include: (a) the order of hierarchical complexity of the actions and interactions of the people involved in a relationship; (b) other contingencies in the situation; and (c) how discriminable the contingencies are in the situation at each given order of hierarchical complexity. Discriminability, however, is only part of what would actually determine attachment processes and behavior. Such processes will also be influenced by a person's current interaction with the environment including what the current contingencies are and what has been that person's conditioning history. Depending on (a) the discriminability, (b) the environmental contingencies, and (c) the person's history, a person will perform at a certain stage. The stage numbers used are generally equivalent to the numbers used in the Model of Hierarchical Complexity. The difference is that, given different conditions, an individual may perform at a stage lower than the order of complexity that they can, at other times, discriminate. Biologically-based maturational processes, such as critical periods, independent locomotion in young children, or puberty during adolescence, may also affect the events that are most salient in the development of attachment behavior.

The paper will use the Model of Hierarchical Complexity to trace out the processes at each stage, beginning with early infancy and continuing to the formal operational stage. Following the infancy period, a number of general trends can be seen. The attachment relationship with the parent, for example, begins to decrease in importance relative to the growing relationships with peers. While this is by no means an overnight occurrence, it is important to recognize that in a very real sense there are increasingly two kinds of attachment relationships that are developing and interacting during childhood and into adolescence and beyond. At the beginning of adolescence, and relating to pubertal changes, a third kind of attachment relationship becomes possible, that is, a romantic relationship that will eventually lead to establishment of a marriage partner or mate. The discussion will stop with the formal operational stage because of the complexity in writing about three or more different kinds of relationships at a time.

Stage 1: Sensory or Motor Stage

During the Sensory or Motor Stage, responsiveness to distress through touching, holding, feeding, or changing is the major attachment process or mechanism. Infants engage either in actions or in perceptions, but do not coordinate the two. The main processes by which attachment can develop and be expressed are respondent conditioning within comforting interactions, habituation to aversive and other stimuli, positive reinforcement of orienting and exploring the environment through the various senses, and negative reinforcement. Distress is mainly elicited and responsive to operant conditioning only in the short term. Negative reinforcement decreases all kinds of distress. As a result, those who are associated with consoling infants become conditioned, comforting stimuli. There is a small preference for a primary caregiver, which seems to be partially based on familiarity (Miller, 1989); the familiar caregiver is more effective at pacification than others. In addition to the caregiver's role in

effectively decreasing distress, habituation may account for a portion of the preference for behaviors or aspects of specific familiar caregivers.

Stage 2: Circular Sensory-Motor Stage

Circular Sensory-Motor actions generally begin sometime after 3 to 6 months of age. As far as the development of attachment is concerned, during this period, positive and playful interactions become an important additional mechanism. During this time the consoling of distress continues to be an important mechanism in the development of attachment. Crying also becomes subject to conditioning. In order for crying to become operantly conditioned, however, it first must occur and then it must be reinforced. A prototypical interaction that might reinforce crying would be for a caregiver to wait until crying has been occurring for some time and only then to respond to it. If caregivers regularly anticipate when crying is about to occur and respond before that happens as much as possible, operant crying will be less likely to develop. Such anticipatory responses might include the removal of stimuli or deprivation states that lead to crying. At the same time, the infant's repertoire of positive behaviors, such as smiling, laughing, and vocalizing, becomes much more likely to occur. This gives ample opportunities for caregivers to use differential reinforcement of alternative behaviors in situations that might otherwise be moving towards distress.

Positive interactional behaviors from the caregiver become reinforcing for the infant, who responds in kind, leading to interactional bouts with pleasure (smiling and laughter) on both sides, including game playing (as discussed in the paper on peek-a-boo in this issue). The pleasure experienced in these interactions adds an additional reinforcing set of events into developing attachment relationships. Simple back and forth interactions are augmented by the presence of imitation. Imitation may be reinforced by the person being imitated by social attention and emotional response. The imitation of smiles and laughs by the primary caregiver are more reinforcing of behavior than when such imitations emanate from others. Therefore, mutual imitation becomes another process involved in strengthening attachment relationships. As the infant develops basic object permanence, caregivers become less substitutable one for the other. Infants develop a clear preference for one or a small number of attachment figures. They begin to have favorite toys, and especially, favorite comfort objects. In contexts where there are multiple attachment figures, infants will develop multiple attachment relationships (Tronick, Morelli & Ivey, 1992), suggesting that any of the processes discussed can be seen in multiple relationships. Infants can and do also discriminate separation from attachment figures. Protest at such separations may appear, although as Gewirtz and Pelaez-Nogueras (1991) have shown this protest can be conditioned. Infants can recognize familiar people in mirrors, looking first at the person and then the image. There is no evidence that infants recognize themselves at this point.

Stage 3: Sensory-motor Stage

Sensory-motor actions begin to be seen around the age when attachment is usually assessed in the "Strange Situation" (8 to 12 months). The infant begins to become mobile and simply because of the increased mobility begins to act independently in a broader arena. Infants can now imitate new behaviors, that they have not performed themselves, although this is most likely if the new behavior is somewhat similar to something the infant already does (Meltzoff, 1988). This is another mechanism that allows the rapid development of many new behaviors. During this time period, the presence of a preferred caregiver can itself serve as a stimulus for

exploration of objects and of new people and situations. Infants move back and forth between seeking contact with the caregiver(s), and exploring away from the caregiver(s). The way in which this back and forth movement is responded to by the caregiver(s) is an important mechanism that can either promote more optimal behavior patterns in the infant or may make it less likely for the infant to be able to explore and move away from the caregiver. Infants use social referencing (Hornik & Gunnar, 1988) as a cue to what is safe to do. Distress becomes a more elaborated set of behaviors, such as uncertainty in a new situation becoming outright crying if the uncertainty cannot be resolved.

The infant has an ever increasing repertoire of different behaviors with respect to the caregiver and with respect to exploring the environment. In particular, infants increasingly make active efforts to engage the caregiver and, if uncertain, to get close to the caregiver. Infants begin to use gestures in interactions with others, such as pointing or reaching (e.g., Fogel & Melson, 1988). Infants also begin to use word-like utterances that caregivers (and researchers) observe as being consistently associated with the same or similar objects or situations (Fogel & Melson, 1988). But these words do not name concepts. These and other new behaviors introduce a major new set of attachment processes: how the infants' active behaviors toward the caregiver are responded to. There are also increasing individual differences in what behaviors an infant will preferentially use. This is what may lead to development of behaviors consistent with the typologies proposed by Ainsworth and colleagues (Ainsworth et al., 1978), although it is still uncertain that characterizing an individual child in terms of one dimension (such as security) makes sense.

Stage 4: Nominal Stage

As the more tentative and less efficient locomotion and motor movements of the previous stage become more practiced and efficient, infants at the nominal stage (from about 12 to 18 months) begin to explore their environments even more intensively. They will both use familiar behaviors in new situations, and also begin to try out variations of behaviors that are not the result of direct imitation. They will show pervasive imitation, being able to imitate many kinds of behavior. This seeming explosion in 'trying things out' brings about a change in the parent-infant relationship in that parents must increasingly attend to their child's safety and to setting limits (e.g., see Fogel, 2001). This introduces a new element into this developing attachment relationship. A parent that sets too many limits may increase the chance that an infant will fail, either by not inhibiting a parental-expected behavior or by failing to perform an expected behavior. Potentially they may end up with a relationship with a great deal of oppositional behavior.

Along with the infant's increased and focused exploratory behavior comes a change in communicative behavior. Infants now are learning to communicate in a more conventional way, that is, to use words as consistent symbols for their referents, as seen in naming or labeling things. Linguistic interactions with parents and others form a large part of the interactions with others, and again can contribute further to the attachment relationship. For example, the infant now not only relies on the parent as a source of physical security, but increasingly a source of useful information and guidance about the world. Infants also have an increasing sense of themselves, as shown by behaviors such as showing off, intentional communication and social referencing (Fogel, 2001). Parents' appreciation of such behaviors can serve to further reinforce them. Finally, some of the first evidence exists for the development of relationships with peers, instead of adults. This begins the process of development of a new set of attachment

relationships. While a great deal of each interactions and play with peers is parallel play (Howes & Matheson, 1992), some occasional responses to a verbal request or a visual regard from the other are seen (Mueller & Lucas, 1975). Field, Vega-Lahr, and Jagdish (1984) have also reported evidence of increased stress when 15-month old infants were transferred from an infant nursery to a toddler nursery. Those transferred along with close friends showed much less disruption.

Stage 5: Sentential Stage

At the sentential stage, there is an ever increasing use of symbols, as seen in such developments as increased and elaborated pretend play and in language use. For example, infants begin to use sentences, typically two-word sentences at first. They, therefore, relate two symbols together. Infants show self-recognition, in a mirror, for example. They begin to refer to themselves (I, my) and also to label themselves (boy, baby). These are all examples of relating two symbols together. The growing sense of self is accompanied by a higher frequency of behaving independently. This can challenge the parent, who again must adjust their behavior to accommodate these changes. If the parent behaves in such a way as to reinforce early attempts at autonomy, while at the same time preventing the child from getting into dangerous situations, this will affect the development of a positive attachment relationship. Adults also play an important role in emotional regulation with infants at this age (Dunsmore & Halberstadt, 1997). Shared emotional experiences, such as helping the child to confront fears, play an important role in the parent-child attachment relationship.

Relationships with peers continue to develop. Some simple turn-taking interactions begin to be observed (Howes & Matheson, 1992). Children select children who are somewhat similar as playmates, and tend to direct mostly positive behaviors towards those children (Ross, Conant, Cheyne & Alevizos, 1992). Attachment processes previously discussed, such as shared interactions that are pleasurable, begin to be important in these relationships.

Stage 6: Preoperational Stage

At the preoperational stage, the child begins to engage in generalized imitation (Gewirtz & Stingle, 1968) and follow what older people in the group do with whom they share an identity, such as same sex parents or attachment figures. Individuals self-labeling, putting themselves into categories, such as gender (Kohlberg, 1966; Miller & Commons, 1973), has effects on their relationships with others. Generalized imitation has been described by Bandura (1986) and Gewirtz and Pelaez-Nogueras (1991). One of the results of such a group identity, such as a sex-role preference (e.g., Kohlberg, 1966; Miller & Commons, 1973) is that not only is there attachment to the group, but behaviors of members of the group serve as reinforcers. Generalized imitation itself can be reinforced when outcomes that are similar to those exhibited by the model are produced. In this case, it is behaviors by the model that reinforce such generalized imitation, for example, laughing upon seeing their own behavior imitated. Generalized imitation means that the model does not have to be present at the time, for example, the modality of the stimuli can be through the media.

Preoperational stage individuals still cannot take another's perspective nor even understand what causes their own behavior beyond the simplest cases. As a result, there cannot yet be any truly reciprocal behavior. There is no sense of a shared self yet there is some empathy. Children may play together but do not play traditional games with rules such as dodge ball, kick ball, hop-

scotch, four square or jump rope. They play with toys but do not use them in a way that demands cooperation. Relationships are asymmetrical. For example, in one preschool, everyone liked a boy because he was the smallest (E. Bett, personal communication, 2007).

Stage 7: Primary Stage

Beginning at the primary stage, individuals can understand and report their own perspective. They can also understand and report the perspective of another person. But, they do not relate these two at the same time (Commons & Rodriguez, 1990). There is actual rule-governed behavior in addition to pervasive imitation. The verbal behavior of attachment objects is vocalized as rules. The children follow rules accurately across time. Children can coordinate their actions with attachment objects. Children recognize their own dependence on the parent. They can discriminate the greater power and competence of the attachment object. If children are asked who is better, they reply that the attachment object is better. Also authority in general is seen as better, more competent, more virtuous. Children compare themselves to the attachment object, a social comparison that requires primary operations.

The perspective of the parent can be seen in the form of rules that the parent states. Insofar as there is moral attachment, feedback from the attachment object affects not only specific behaviors but mood as well. Such evaluations change the discriminated value of the self as well. Producing pervasively matched behavior is reinforced not only by the usual reinforcing events associated with the outcomes produced by such behaviors but also by the appearance of similarity, which is valued in itself. One can be very pleased to wear dad's shoes or mom's hats whether they are around and reinforce the behavior, or not. Outcomes delivered to the parents may reinforce behavior of the child, because of the shared self.

Many children refer to the teacher as just "teacher." They have friends only in the most curious way. They like a child because of the toys the child has, or the activity they can engage in with that child. The "friend" is a means to an end (Selman, 1981).

Stage 8: Concrete Stage

At the concrete stage, individuals coordinate the perspective of the other person with their own (Commons, Danaher-Gilpin, Miller & Goodheart, 2007). Two new sources of attachment objects appear: immediately propinquitous peers and small groups such as local teams. With peers, friendship is now mutual (Selman, 1981), and relationships in general are discussed in terms of exchanges between people, in which the exchanges are seen as being based in actual physical actions, objects, or other concrete instantiations. Shared activity with some degree of compatibility is the basis of peer attachment. Small groups of friends can form very small cliques, of two to four members. Relationships are seen in terms of the activities and behaviors of the people involved (mother-child; male-female), rather than as being between individuals.

While with peers, people can ignore the basic attachment figure to some degree. Immediate social reinforcement from peers is sometimes more effective than more general rules in controlling behavior. Hence, parental authority is sometimes ignored. While in the preoperational and primary stages, children will act out what they see or hear in the adult world, during concrete operations the shared-self may extend to models that appear in written or spoken stories. These are models that appear quite real as opposed to the mythical figures from the earlier two stages.

People change the way they behave with different friends. The perspective of the other is discriminated by considering how one's own behavior will affect another's behavior, the other person's behavior possibly reinforcing one's own. With such perspective taking, it is possible to form attachments to named peer groups, such as cub scouts, brownies, camp fire girls. The attachment is to the authority embodied in that group. For example, at this stage, one might root for the Saint Louis Cardinals because they are the local team. But one might not feel like a kindred fan with someone else who also likes the Cardinals. Teachers become real authorities, not just directors of activities and providers. One needs to placate them to gain favor. Teachers and other such authorities are treated as individuals. Hence the school has a name and so do each of the teachers. Authority figures in general are good. There is a strong sense of shared self, the objects now being extended to informal local organizations. Rules are good and to be followed.

Stage 9: Abstract Stage

When they reach the abstract stage and can form abstractions, individuals can take the perspective of another abstract person, in addition to an actual or concrete person. For this reason, relationships become based more on social norms than on specific agreements between individuals. People do not, however, interrelate two variables or abstractions. They can only focus on one variable at a time. New attachment objects are learned. For example, group identification develops along with serious attachment to groups and group members. This attachment results in imitation of group members' behaviors. This includes nationalism (but in a local sense), allegiance to teams, schools, companies, religions and mates. People see themselves as belonging to one of the "socially acceptable" groups or to an out group. People have circles of friends, quite often different sets depending on the activities. Friends try to act harmoniously. The group members' displayed view of themselves can serve as a reinforcer or punisher. Following the rules of a group makes one good. Nevertheless, there are multiple sources for the rules, since there can be multiple groups.

At this stage, people select attachment figures other than caregivers and immediate peers. Marriages tend to follow social norms. Having a harmonious marriage is most important (Armon, 1984). At this stage, one might begin to see attachment to certain abstract ideals, such as the idea of harmony. This stage is illustrated by some abstract-stage statements about relationships in which the relationship, emotions within the relationship, or a person's reaction are explicitly or implicitly quantified along a dimension.

Stage 10: Formal Stage

At the formal stage, individuals coordinate two abstract variables and thereby begin to understand logical, empirical relationships between those variables. For example, they may learn to relate the values of the variable of what a person does to the variable consisting of the different outcomes that follow. This gets applied both to the subdomain of interpersonal relationships, and to the subdomain of groups. The perspective is that within each subdomain consistent, logically-based relationships between behaviors and outcomes can be learned.

In the subdomain of interpersonal relationships, for example, how others-in-the abstract will behave can be experimentally and logically examined. This consists of a more advanced form of social perspective taking. People may figure out what to do to influence other people. The individual may now try varying their own behavior to see if they can have a positive impact on a

particular attachment relationship. But they do not understand the circular nature of causality. That is they do not discriminate how their own behavior affects the occurrence of the behaviors of others which in turn, comes back to affect them.

There may be increased opposition to norms of basic attachment figures based on attachment to peer figures other than just parents and relatives. There is a concomitant weakening of dependence on those family figures. Despite the possible increasing opposition to parents and to other authority figures, there is conformity to age-appropriate peer groups. This is not in just superficial ways as in the abstract stage but in terms of the effectiveness of the group to use rule-governed behavior to subtly define the relationship between the person and the system. The resistance to authority figures is a direct result of the new reliance on empirical evidence, especially when the behavior of authority figures does not conform to the empirical evidence obtained. For many, attachment to romantic partners from the peer group introduces a new set of attachment processes. For example, physical and sexual pleasure are seen empirically and logically to reinforce and increase attachment.

Subgroups are to be affiliated with. One subgroup, usually the one that one is in, is seen as superior to all others. The perception is that its rules, regulations and notions are superior to others. This is different from group affiliation at the abstract stage because the characteristics of groups are empirically validated. The costs of being in some outside group are perceived as being high.

The rule governed behavior becomes formalized in the form of regulations. The rules lead people to have an idealization of the leadership of their chosen group. The regulations are just part of the ways in which roles become more formally delineated. This also leads to attachments to such figures as presidents of organizations. Such people are seen as fair, sensible, reasonable and caring.

Conclusion

Attachment processes begin with a simple set of behaviors. Different kinds of distress of infants are responded to, and these responses, if effective in decreasing distress, strengthen attachment. Infants at the beginning do not play a very active role in the formation of attachment. Three major trends can be seen as individuals develop. First, as the infant develops into a toddler, then a child, then an adolescent, they become more active in the interaction.

Second, throughout development, reinforcement contingencies and respondent conditioning play an important role in the development of relationships. For example, at the circular sensory motor stage, infants' smiling, laughing and vocalizing in interactions with caregivers results in mutual pleasure. As infants become more independent and start exploring the world, the caregiver responds by allowing for these new behaviors in a safe way. In each case, the underlying respondent association of the outcome produced by the caregiver gets associated with that caregiver, thereby changing the caregiver's value. The caregiver or other attachment object is seen not only as a source of reinforcement and comfort, but as a powerful figure. Just as surely as the value can become more positive, for caregivers who do not behave in an ideal way, this value can become more negative.

Third, as was discussed above, although the fundamental learning processes stay the same, the specific behaviors, the interactions within which they take place and the kinds of attachment objects that are involved change. The learning that takes place in these new interactions does not necessarily replace the old ways of interacting. For example, some degree of distress reduction is part of any relationship. What does seem true is that as

individuals get older there will most typically be a number of co-occurring situations in which attachment behaviors with a particular attachment object are either reinforced or not.

Implicit in this discussion is also the idea that some individuals, for a variety of reasons, may not progress through this stage sequence to the same point. As discussed in our paper on early negative caregiving experiences, this may be because of caregiving that is negative rather than positive.

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