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Child development stages

Child development stages describe theoretical milestones of child development. Many stage models of development have been proposed, used as working concepts and in some cases asserted as → nativist theories.

This article puts forward a general model based on the most widely accepted developmental stages. However, it is important to understand that there is wide variation in terms of what is considered "normal," driven by a wide variety of genetic, cognitive, physical, family, cultural, nutritional, educational, and environmental factors. Many children will reach some or most of these milestones at different times from the norm.

Overview of motor, speech, vision and hearing development

Developmental Milestones[1]

Age	Motor	Speech	Vision and hearing	Additional Notes
4–6 weeks				Smiles at parent
6–8 weeks		Vocalizes		
3 months	Prone:head held up for prolonged periods. No grasp reflex	Makes vowel noises	Follows dangling toy from side to side. Turns head round to sound	Squeals with delight appropriately. Discriminates smile.
5 months	Holds head steady. Goes for objects and gets them. Objects taken to mouth	Enjoys vocal play		
6 months	Transfers objects from one hand to the other. Pulls self up to sit and sits erect with supports. Rolls over prone to supine. Palmar grasp of cube	Double syllable sounds such as 'mumum' and 'dada'	Localises sound 45 cm lateral to either ear	May show 'stranger shyness'
9–10 months	Wiggles and crawls. Sits unsupported. Picks up objects with pincer grasp	Babbles tunefully	Looks for toys dropped	Apprehensive about strangers
1 year	Stands holding furniture. Stands alone for a second or two, then collapses with a bump	Babbles 2 or 3 words repeatedly	Drops toys, and watches where they go	Cooperates with dressing, waves goodbye, understands simple commands
18 months	Can walk alone. Picks up toy without falling over. Gets up/down stairs holding onto rail. Begins to jump with both feet. Can build a tower of 3 or 4 cubes and throw a ball	'Jargon'. Many intelligible words		Demands constant mothering. Drinks from a cup with both hands. Feeds self with a spoon. Most children with autism are diagnosed at this age.
2 years	Able to run. Walks up and down stairs 2 feet per step. Builds tower of 6 cubes	Joins 2-3 words in sentences		Parallel play. Dry by day
3 years	Goes up stairs 1-foot per step and downstairs 2 feet per step. Copies circle, imitates cross and draws man on request. Builds tower of 9 cubes	Constantly asks questions. Speaks in sentences		Cooperative play. Undresses with assistance. Imaginary companions
4 years	Goes down stairs one foot per step, skips on one foot. Imitates gate with cubes, copies a cross	Questioning at its height. Many infantile substitutions in speech		Dresses and undresses with assistance. Attends to own toilet needs
5 years	Skips on both feet and hops. Draws a man and copies a triangle. Gives age	Fluent speech with few infantile substitutions in speech		Dresses and undresses alone

6 years	Copies a diamond. Knows right from left and number of fingers	Fluent speech

Physical specifications

Age	Average length/height (cm)	Length growth	Average weight	Weight gain	Respiration rate (per minute)	Normal body temperature	Heart rate (pulse) (per minute)	Visual acuity (Snellen chart)
1–4 months	50–70 cm (20–28 in)	2.5 cm (0.98 in) per month	4–8 kg (8.8–18 lb)	100-200 g per week	30 to 40	35.7-37.5 °C		
4–8 months	70–75 cm (28–30 in)	1.3 cm (0.51 in) per month	(doubling birth weight)	500 g per month	25 to 50			
8–12 months	Approx. 1.5 times birth length by first birthday		9.6 kg (21 lb) Nearly triple the birth weight by first birthday	500 g per month	20 to 45	35.7–37.5 °C (96–100 °F)		20/100
12–24 months	80–90 cm (31–35 in)	5–8 cm (2.0–3.1 in) per year	9–13 kg (20–29 lb)	130-250 g per month	22 to 40		80 to 110	20/60
2 years	85–95 cm (33–37 in)	7–13 cm (2.8–5.1 in) per year	12–15 kg (26–33 lb) about 4 times birth weight	1 kg per year	20 to 35			
3 years	95–100 cm (37–39 in) Nearly double birth length	5–8 cm (2.0–3.1 in) per year	13–17 kg (29–37 lb)	1.4-2.3 kg per year	20 to 30	35-37 °C	90 to 110	20/40
4 years	101.6–114 cm (40.0–44.9 in)	5–6.5 cm (2.0–2.6 in) per year	14.5–17 kg (32–37 lb)	1.8-2.3 kg per year	20-30	36.6-37.4°C	90 to 110	20/30
5 years	105–115 cm (41–45 in)	5–6.5 cm (2.0–2.6 in) per year	17–21 kg (37–46 lb)	1.8-2.3 kg per year	20-30		90 to 110	20/20
>5 years	105–120 cm (41–47 in)	5–7 cm (2.0–2.8 in) per year	17–22 kg (37–49 lb)	2 kg per year				

Specifications sorted by reached age

Creative development could very well be seen as how the child learns in its environment through experimenting in different ways of doing everything.

1-4 months

Physical

- Head and chest circumference are nearly equal to the part of the abdomen.
- Head circumference increases approximately 2 cm per month until two months, then increases 1.5 cm per month until four months. Increases are an important indication of continued brain growth.
- Continues to breathe using abdominal muscles.
- Posterior fontanel closes by the second month.
- Anterior fontanel closes to approximately 1.3 cm.
- Skin remains sensitive and easily irritated.
- Legs may appear slightly bowed.
- Cries with tears.
- Eyes begin moving together in unison (binocular vision).

Motor development

- Rooting and sucking reflexes are well developed.
- Swallowing reflex and tongue movements are still immature; continued drooling and inability to move food to the back of the mouth.
- Grasp reflex gradually disappears.
- *Landau reflex* appears near the middle of this period; when baby is held in a prone (face down) position, the head is held upright and legs are fully extended.
- Grasps with entire hand; strength insufficient to hold items. Holds hands in an open or semi-open position.
- Muscle strength and control improving; early movements are large and jerky; gradually become smoother and more purposeful.
- Raises head and upper body on arms when in a prone position.
- Turns head side to side when in a supine (face up) position; near the end of this period can hold head up and in line with the body.
- Upper body parts are more active: clasps hands above face, waves arms about, reaches for objects.

4-8 months

Physical

- Head and chest circumferences are basically equal.
- Head circumference increases approximately 1 cm per month until six to seven months, then 0.5 cm per month; head circumference should continue to increase steadily, indicating healthy, ongoing brain growth.
- Breathing is abdominal; respiration rate depending on activity; rate and patterns vary from infant to infant.
- Teeth may begin to appear, with upper and lower incisors coming in first. Gums may become red and swollen, accompanied by increased drooling, chewing, biting, and mouthing of objects.
- Legs may appear bowed; bowing gradually disappears as infant grows older.
- Fat rolls ("Baby Fat") appear on thighs, upper arms and neck.
- True eye color is established.

Motor development

- Reflexive behaviors are changing:
- Blinking reflex is well established
- Sucking reflex becomes voluntary
- Moro reflex disappears
- When lowered suddenly, infant throws out arms as a protective measure.
- Swallowing reflex appears and allows infant to move solid foods from front of mouth to the back for swallowing.
- Picks up objects using finger and thumb (pincer grip).
- Reaches for objects with both arms simultaneously; later reaches with one hand or the other.
- Transfers objects from one hand to the other; grasps object using entire hand (palmar grasp).
- Handles, shakes, and pounds objects; puts everything in mouth.
- Able to hold bottle.
- Sits alone without support, holding head erect, back straightened, and arms propped forward for support
- Pulls self into a crawling position by raising up on arms and drawing knees up beneath the body; rocks back and forth, but generally does not move forward.
- Lifts head when placed on back.
- Can roll over from back or stomach position.
- May accidentally begin scooting backwards when placed on stomach; soon will begin to crawl forward.
- Looks for fallen objects by 7 months
- Plays 'peek-a-boo' games
- Cannot understand "no" or "danger"

8-12 Months

Physical

- Respiration rates vary with activity
- Environmental conditions, weather, activity, and clothing still affect variations in body temperature.
- Head and chest circumference remain equal.
- Continues to use abdominal muscles for breathing.
- Anterior fontanel begins to close.
- More teeth appear, often in the order of two lower incisors then two upper incisors followed by four more incisors and two lower molars but some babies may still be waiting for their first.
- Arm and hands are more developed than feet and legs (cephalocaudal development); hands appear large in proportion to other body parts.
- Legs may continue to appear bowed.
- "Baby Fat" continues to appear on thighs, upper arms and neck.
- Feet appear flat as arch has not yet fully developed.
- Both eyes work in unison (true binocular coordination).
- Can see distant objects (4 to 6 m or 13 to 20 ft away) and points at them.

Motor development

- Reaches with one hand leading to grasp an offered object or toy.
- Manipulates objects, transferring them from one hand to the other.
- Explores new objects by poking with one finger.
- Uses deliberate pincer grasp to pick up small objects, toys, and finger foods.
- Stacks objects; also places objects inside one another.
- Releases objects or toys by dropping or throwing; cannot intentionally put an object down.
- Beginning to pull self to a standing position.
- Beginning to stand alone, leaning on furniture for support; moves around obstacles by side-stepping.
- Has good balance when sitting; can shift positions without falling.
- Creeps on hands and knees; crawls up and down stairs.
- Walks with adult support, holding onto adult's hand; may begin to walk alone.
- Watches people, objects, and activities in the immediate environment.
- Shows awareness of distant objects (4 to 6 m or 13 to 20 ft away) by pointing at them.
- Responds to hearing tests (voice localization); however, loses interest quickly and, therefore, may be difficult to test informally.
- Follows simple instructions.
- Reaches for toys that are out of reach but visible
- Recognizes objects in reverse
- Drops thing intentionally and repeats and watches object
- Imitates activities like playing drum

Psychological development

Trust versus Mistrust (Erikson's stages of psychosocial development)

Toddlers (12-24 months)

Physical

- Weight is now approximately 3 times the child's birth weight.
- Respiration rate varies with emotional state and activity.
- Rate of growth slows
- Head size increases slowly; grows approximately 1.3 cm every six months; anterior fontanelle is nearly closed at eighteen months as bones of the skull thicken.
- Chest circumference is larger than head circumference.
- Rapid eruption of teeth; six to ten new teeth will appear.
- Legs may still appear bowed.
- Toddler will begin to lose the "Baby Fat" once he/she begins walking.
- Body shape changes; takes on more adult-like appearance; still appears top-heavy; abdomen protrudes, back is swayed.

Motor development

- Crawls skillfully and quickly.
- Stands alone with feet spread apart, legs stiffened, and arms extended for support.
- Gets to feet unaided.
- Most children walk unassisted near the end of this period; falls often; not always able to maneuver around obstacles, such as furniture or toys.
- Uses furniture to lower self to floor; collapses backwards into a sitting position or falls forward on hands and then sits.
- Enjoys pushing or pulling toys while walking.
- Repeatedly picks up objects and throws them; direction becomes more deliberate.
- Attempts to run; has difficulty stopping and usually just drops to the floor.
- Crawls up stairs on all fours; goes down stairs in same position.
- Sits in a small chair.
- Carries toys from place to place.
- Enjoys crayons and markers for scribbling; uses whole-arm movement.
- Helps feed self; enjoys holding spoon (often upside down) and drinking from a glass or cup; not always accurate in getting utensils into mouth; frequent spills should be expected.
- Helps turn pages in book.
- Stacks two to six objects per day.

Cognitive development

- Enjoys object-hiding activities
- Early in this period, the child always searches in the same location for a hidden object (if the child has watched the hiding of an object). Later, the child will search in several locations.
- Passes toy to other hand when offered a second object (referred to as "crossing the midline"-an important neurological development).
- Manages three to four objects by setting an object aside (on lap or floor) when presented with a new toy.
- Puts toys in mouth less often.
- Enjoys looking at picture books.
- Demonstrates understanding of functional relationships (objects that belong together): Puts spoon in bowl and then uses spoon as if eating; places teacup on saucer and sips from cup; tries to make doll stand up.
- Shows or offers toy to another person to look at.
- Names many everyday objects.
- Shows increasing understanding of spatial and form discrimination: puts all pegs in a pegboard; places three geometric shapes in large formboard or puzzle.
- Places several small items (blocks, clothespins, cereal pieces) in a container or bottle and then dumps them out.
- Tries to make mechanical objects work after watching someone else do so.
- Responds with some facial movement, but cannot truly imitate facial expression.
- Most children with autism are diagnosed at this age.

Language

- Produces considerable "jargon": puts words and sounds together into speech-like (inflected) patterns.
- Holophrastic speech: uses one word to convey an entire thought; meaning depends on the inflection ("me" may be used to request more cookies or a desire to feed self). Later; produces two-word phrases to express a complete thought (telegraphic speech): "More cookie," "Daddy bye-bye."
- Follows simple directions, "Give Daddy the cup."
- When asked, will point to familiar persons, animals, and toys.
- Identifies three body parts if someone names them: "Show me your nose (toe, ear)."
- Indicates a few desired objects and activities by name: "Bye-bye," "cookie"; verbal request is often accompanied by an insistent gesture.
- Responds to simple questions with "yes" or "no" and appropriate head movement.
- Speech is 25 to 50 percent intelligible during this period.
- Locates familiar objects on request (if child knows location of objects).
- Acquires and uses five to fifty words; typically these are words that refer to animals, food, and toys.
- Uses gestures, such as pointing or pulling, to direct adult attention.
- Enjoys rhymes and songs; tries to join in.
- Seems aware of reciprocal (back and forth) aspects of conversational exchanges; some turn-taking in other kinds of vocal exchanges, such as making and imitating sounds.

Social

- less wary of strangers.
- Helps pick up and put away toys.
- Plays by themselves
- Enjoys being held and read to.
- Often imitates adult actions in play.
- Enjoys adult attention; likes to know that an adult is near; gives hugs and kisses.
- Recognizes self in mirror.
- Enjoys the companionship of other children, but does not play cooperatively.
- Beginning to assert independence; often refuses to cooperate with daily routines that once were enjoyable; resists getting dressed, putting on shoes, eating, taking a bath; wants to try doing things without help.
- May have a tantrum when things go wrong or if overly tired or frustrated.
- Exceedingly curious about people and surroundings; toddlers need to be watched carefully to prevent them from getting into unsafe situations.

Psychological

Autonomy vs. Shame and Doubt (will)

(J. Chasse, 2008) Psychosocial stimulation is vital during the toddler years. Play begins to become interactive. Toddlers begin to learn and exhibit independence, but ironically they enjoy sharing this discovery with others. Another important advancement is active social play with adults including mirroring and repeating. Songs, rhymes, and finger plays (eg. itsy bitsy spider, little teapot, etc.) are a great way to encourage and stimulate this area of development.

Two year old

Physical

- Posture is more erect; abdomen still large and protruding, back swayed, because abdominal muscles are not yet fully developed.
- Respirations are slow and regular
- Body temperature continues to fluctuate with activity, emotional state, and environment.
- Brain reaches about 80 percent of its adult size.
- 15 baby teeth almost finished growing out

Motor development

- Can walk around obstacles and walk more erect
- Squats for long periods while playing.
- Climbs stairs unassisted (but not with alternating feet).
- Balances on one foot (for a few moments), jumps up and down, but may fall.
- Often achieves toilet training during this year (depending on child's physical and neurological development) although accidents should still be expected; the child will indicate readiness for toilet training.
- Throws large ball underhand without losing balance. Holds cup or glass (be sure it is unbreakable) in one hand. Unbuttons large buttons; unzips large zippers.
- Opens doors by turning doorknobs.
- Grasps large crayon with fist; scribbles enthusiastically on large paper.
- Climbs up on chair, turns around and sits down.
- Enjoys pouring and filling activities-sand, water, styrofoam peanuts.
- Stacks four to six objects on top of one another.
- Uses feet to propel wheeled riding toys.

Cognitive

- Eye-hand movements better coordinated; can put objects together, take them apart; fit large pegs into pegboard.
- Begins to use objects for purposes other than intended (may push a block around as a boat).
- Does simple classification tasks based on one dimension (separates toy dinosaurs from toy cars).
- Stares for long moments; seems fascinated by, or engrossed in, figuring out a situation: where the tennis ball has rolled, where the dog has gone, what has caused a particular noise.
- Attends to self-selected activities for longer periods of time. Discovering cause and effect: squeezing the cat makes her scratch.
- Knows where familiar persons should be; notes their absence; finds a hidden object by looking in last hiding place first. (This is what Piaget termed object permanence, which usually occurs during the sensorimotor stage of Piaget's childhood theory of cognitive development)
- Names objects in picture books; may pretend to pick something off the page and taste or smell it.
- Recognizes and expresses pain and its location.
- Is expected to use magical thinking, such as believing that a toy bear is a real bear.

Language

- Enjoys being read to if allowed to participate by pointing, making relevant noises, turning pages.
- Realizes that Language is effective for getting others to respond to needs and preferences.
- Uses fifty to three hundred different words; vocabulary continuously increasing.
- Has broken the linguistic code; in other words, much of a two-year-old's talk has meaning to him or her.
- Receptive Language is more developed than expressive Language; most two-year olds understand significantly more than they can talk about.
- Utters three- and four-word statements; uses conventional word order to form more complete sentences.
- Refers to self as "me" or sometimes "I" rather than by name: "Me go bye-bye"; has no trouble verbalizing "mine."
- Expresses negative statements by tacking on a negative word such as "no" or "not": "Not more milk."
- Repeatedly asks, "What's that?"
- Uses some plurals; tells about objects and events not immediately present (this is both a cognitive and linguistic advance).
- Some stammering and other dysfluencies are common.
- Speech is as much as 65 to 70 percent intelligible.
- Is able to verbalize needs.

Social and emotional

- Shows signs of empathy and caring: comforts another child if hurt or frightened; appears to sometimes be overly affectionate in offering hugs and kisses to children
- Continues to use physical aggression if frustrated or angry (for some children, this is more exaggerated than for others); Physical aggression usually lessens as verbal skills improve.
- Temper tantrums likely to peak during this year; cannot be reasoned with while tantrum is in progress.
- Impatient; finds it difficult to wait or take turns.
- Enjoys "helping" with household chores; imitates everyday activities: may try to toilet a stuffed animal, feed a doll.
- "Bossy" with parents and caregivers; orders them around, makes demands, expects immediate compliance from adults.
- Watches and imitates the play of other children, but seldom joins in; content to play alone.
- Offers toys to other children, but is usually possessive of playthings; still tends to hoard toys.
- Making choices is difficult; wants it both ways.
- Often defiant; shouting "no" becomes automatic.
- Ritualistic; wants everything "just so"; routines carried out exactly as before; belongings placed "where they belong."

Three year old

Physical

- Growth is steady though slower than in first two years.
- Adult height can be predicted from measurements of height at three years of age; males are approximately 53% of their adult height and females, 57%.
- Legs grow faster than arms,
- Circumference of head and chest is equal; head size is in better proportion to the body.
- "Baby fat" disappears as neck appears.
- Posture is more erect; abdomen no longer protrudes.
- Slightly knock-kneed.
- can jump from low step

- can stand up and walk around on tiptoes
- "baby" teeth stage over.
- Needs to consume approximately 6,300 J (1,500 calories) daily.

Motor development

- Walks up and down stairs unassisted, using alternating feet; may jump from bottom step, landing on both feet.
- Can walk on one foot, balance momentarily.
- Can kick big ball-shaped objects.
- Needs minimal assistance eating.
- Jumps on the spot.
- Pedals a small tricycle.
- Throws a ball overhand; aim and distance are limited.
- Catches a large bounced ball with both arms extended.
- Enjoys swinging on a swing (not too high or too fast).
- Shows improved control of crayons or markers; uses vertical, horizontal and circular strokes.
- Holds crayon or marker between first two fingers and thumb (tripod grasp), not in a fist as earlier.
- Can turn pages of a book one at a time.
- Enjoys building with blocks.
- Builds a tower of eight or more blocks.
- Enjoys playing with clay; pounds, rolls, and squeezes it.
- May begin to show hand dominance.
- Carries a container of liquid, such as a cup of milk or bowl of water, without much spilling; pours liquid from pitcher into another container.
- Manipulates large buttons and zippers on clothing.
- Washes and dries hands; brushes own teeth, but not thoroughly.
- Usually achieves complete bladder control during this time.

Cognitive development

- Listens attentively to age-appropriate stories.
- Makes relevant comments during stories, especially those that relate to home and family events.
- Likes to look at books and may pretend to "read" to others or explain pictures.
- Enjoys stories with riddles, guessing, and "suspense."
- Speech is understandable most of the time.
- Produces expanded noun phrases: "big, brown dog."
- Produces verbs with "ing" endings; uses "-s" to indicate more than one; often puts "-s" on already pluralized forms: geeses, mices.
- Indicates negatives by inserting "no" or "not" before a simple noun or verb phrase: "Not baby."
- Answers "What are you doing?", "What is this?", and "Where?" questions dealing with familiar objects and events.

Social development

- Stacks objects in sized order and can make a pyramid
- Seems to understand taking turns, but not always willing to do so.
- Friendly; laughs frequently; is eager to please.
- Has occasional nightmares and fears the dark, monsters, or fire.
- Joins in simple games and group activities, sometimes hesitantly.
- Often talks to self.
- Uses objects symbolically in play: block of wood may be a truck, a ramp, a bat.
- Observes other children playing; may join in for a short time; often plays parallel to other children.
- Defends toys and possessions; may become aggressive at times by grabbing a toy, hitting another child, hiding toys.
- Engages in make-believe play alone and with other children.
- Shows affection toward children who are younger or children who get hurt.
- Sits and listens to stories up to ten minutes at a time; does not bother other children listening to story and resents being bothered.
- May continue to have a special blanket, stuffed animal, or toy for comfort.
- Know how to count to ten.
- Know how to name 6 colors.

Four year old

Physical Development

- Head circumference is usually not measured after age three.
- Requires approximately 1,700 calories daily.
- Hearing acuity can be assessed by child's correct usage of sounds and *Language also, by the child's appropriate responses to questions and instructions.

Motor Development

- Walks a straight line (tape or chalk line on the floor).
- Hops on one foot.
- Pedals and steers a wheeled toy with confidence; turns corners, avoids obstacles and oncoming "traffic."
- Climbs ladders, trees, playground equipment.
- Jumps over objects 12 to 15 cm (5 to 6 in) high; lands with both feet together.
- Runs, starts, stops, and moves around obstacles with ease.
- Throws a ball overhand; distance and aim improving.
- Builds a tower with ten or more blocks.
- Forms shapes and objects out of clay: cookies, snakes, simple animals.
- Reproduces some shapes and letters.
- Holds a crayon or marker using a tripod grasp.
- Paints and draws with purpose; may have an idea in mind, but often has problems implementing it so calls the creation something else.
- Becomes more accurate at hitting nails and pegs with hammer.
- Threads small wooden beads on a string.
- Can run in a circle

Cognitive

- Can recognize that certain words sound similar
- Names eighteen to twenty uppercase letters. Writes several letters and sometimes their name. `
- A few children are beginning to read simple books, such as alphabet books with only a few words per page and many pictures.
- Likes stories about how things grow and how things operate.
- Delights in wordplay, creating silly Language.
- Understands the concepts of "tallest," "biggest," "same," and "more"; selects the picture that has the "most houses" or the "biggest dogs."
- Rote counts to 20 or more.
- Understands the sequence of daily events: "When we get up in the morning, we get dressed, have breakfast, brush our teeth, and go to school."
- When looking at pictures, can recognize and identify missing puzzle parts (of person, car, animal).
- Very good storytellers.

Language

- Uses the prepositions "on," "in," and "under."
- Uses possessives consistently: "hers," "theirs," "baby's."
- Answers "Whose?", "Who?", "Why?", and "How many?"
- Produces elaborate sentence structures: "The cat ran under the house before I could see what color it was."
- Speech is almost entirely intelligible.
- Begins to correctly use the past tense of verbs: "Mommy closed the door," "Daddy went to work."
- Refers to activities, events, objects, and people that are not present.
- Changes tone of voice and sentence structure to adapt to listener's level of under-standing: To baby brother, "Milk gone?" To Mother, "Did the baby drink all of his milk?"
- States first and last name, gender, siblings' names, and sometimes own telephone number.
- Answers appropriately when asked what to do if tired, cold, or hungry. Recites and sings simple songs and rhymes.

Social development

- Outgoing; friendly; overly enthusiastic at times.
- Moods change rapidly and unpredictably; laughing one minute, crying the next; may throw tantrum over minor frustrations (a block structure that will not balance); sulk over being left out.
- Imaginary playmates or companions are common; holds conversations and shares strong emotions with this invisible friend.
- Boasts, exaggerates, and "bends" the truth with made-up stories or claims of boldness; tests the limits with "bathroom" talk.
- Cooperates with others; participates in group activities.
- Shows pride in accomplishments; seeks frequent adult approval.
- Often appears selfish; not always able to take turns or to understand taking turns under some conditions; tattles on other children.
- Insists on trying to do things independently, but may get so frustrated as to verge on tantrums when problems arise: paint that drips, paper airplane that will not fold right.
- Enjoys role-playing and make-believe activities.
- Relies (most of the time) on verbal rather than Physical aggression; may yell angrily rather than hit to make a point; threatens: "You can't come to my birthday party"
- Name-calling and taunting are often used as ways of excluding other children.

- Establishes close relationships with playmates; beginning to have "best" friends.

Psychological

Initiative Vs. Guilt. During this third stage, the "play age," or the later preschool years (from about 3½ to, in the United States culture, entry into formal school). During it, the healthily developing child learns: (1) to imagine, to broaden his skills through active play of all sorts, including fantasy (2) to cooperate with others (3) to lead as well as to follow. Immobilized by guilt, he is: (1) fearful (2) hangs on the fringes of groups (3) continues to depend unduly on adults and (4) is restricted both in the development of play skills and in imagination.

Five year old

Physical

- Head size is approximately that of an adult's.
- May begin to lose "baby" (deciduous) teeth.
- Body is adult-like in proportion.
- Requires approximately 7,500 J (1,800 calories) daily
- Visual tracking and binocular vision are well developed.

Motor development

- Walks backwards, toe to heel.
- Walks unassisted up and down stairs, alternating feet.
- May learn to turn somersaults (should be taught the right way in order to avoid injury).
- Can touch toes without flexing knees.
- Walks a balance beam.
- Learns to skip using alternative feet.
- Catches a ball thrown from 1 m (3.3 ft) away.
- Rides a tricycle or wheeled toy with speed and skillful steering; some children learning to ride bicycles, usually with training wheels.
- Jumps or hops forward ten times in a row without falling.
- Balances on either foot with good control for ten seconds.
- Builds three-dimensional structures with small cubes by copying from a picture or model.
- Reproduces many shapes and letters: square, triangle, A, I, O, U, C, H, L, T.
- Demonstrates fair control of pencil or marker; may begin to colour within the lines.
- Cuts on the line with scissors (not perfectly).
- Hand dominance is fairly well established.

Cognitive

- Forms rectangle from two triangular cuts.
- Builds steps with set of small blocks.
- Understands concept of same shape, same size.
- Sorts objects on the basis of two dimensions, such as color and form.
- Sorts a variety of objects so that all things in the group have a single common feature (classification skill: all are food items or boats or animals).
- Understands the concepts of smallest and shortest; places objects in order from shortest to tallest, smallest to largest.
- Identifies objects with specified serial position: first, second, last.
- Rote counts to 20 and above; many children count to 100.

- Recognizes numerals from 1 to 10.
- Understands the concepts of less than: "Which bowl has less water?"
- Understands the terms dark, light, and early: "I got up early, before anyone else. It was still dark."
- Relates clock time to daily schedule: "Time to turn on TV when the little hand points to 5."
- Some children can tell time on the hour: five o'clock, two o'clock.
- Knows what a calendar is for.
- Recognizes and identifies coins; beginning to count and save money.
- Many children know the alphabet and names of upper- and lowercase letters.
- Understands the concept of half; can say how many pieces an object has when it's been cut in half.
- Asks innumerable questions: Why? What? Where? When?
- Eager to learn new things.

Language development

- Vocabulary of 1,500 words plus.
- Tells a familiar story while looking at pictures in a book.
- Defines simple words by function: a ball is to bounce; a bed is to sleep in.
- Identifies and names four to eight colours.
- Recognizes the humor in simple jokes; makes up jokes and riddles.
- Produces sentences with five to seven words; much longer sentences are not unusual.
- States the name of own city or town, birthday, and parents' names.
- Answers telephone appropriately; calls person to phone or takes a brief message
- Speech is almost entirely intelligible.
- Uses "would" and "could" appropriately.
- Uses past tense of irregular verbs consistently: "went," "caught," "swam."
- Uses past-tense inflection (-ed) appropriately to mark regular verbs: "jumped," "rained," "washed."

Social development

- Enjoys and often has one or two focus friendships.
- Plays cooperatively (can lapse), is generous, takes turns, shares toys.
- Participates in group play and shared activities with other children; suggests imaginative and elaborate play ideas.
- Shows affection and caring towards others especially those "below" them or in pain
- Generally subservient to parent or caregiver requests.
- Needs comfort and reassurance from adults but is less open to comfort.
- Has better self-control over swings of emotions.
- Likes entertaining people and making them laugh.
- Boasts about accomplishments.

Physical

- Weight gains reflect significant increases in muscle mass.
- Heart rate and respiratory rates are close to adults.
- Body may appear lanky as through period of rapid growth.
- Baby teeth beginning to be replaced by permanent ones, starting with the two upper front teeth
- 20/20 eyesight; if below 20/40 should see a professional.
- The most common vision problem during middle childhood is myopia, or nearsightedness. (Berk, 2007).
- Uses 6,700 J to 7,100 J (1,600 to 1,700 calories) a day.

Motor development

- Gains greater control over large and fine motor skills; movements are more precise and deliberate, though some clumsiness persists.
- Enjoys vigorous running, jumping, climbing, and throwing est.
- Has trouble staying still.
- Span of attention increases; works at tasks for longer periods of time, though
- Can concentrate effort but not always consistently.
- Understands time (today, tomorrow, yesterday) and simple motion (things go faster than others).
- Recognizes seasons and major activities done in the times.
- Has fun with problem solving and sorting activities like stacking, puzzles and mazes
- Enjoys the challenge of puzzles, counting and sorting activities, paper-and-pencil mazes, and games that involve matching letters and words with pictures.
- Recognizes some words by sight; attempts to sound out words
- In some cases the child may be reading well.
- functioning which facilitates learning to ride a bicycle, swim, swing a bat, or kick a ball.
- Making things is enjoyed.
- Reverses or confuse certain letters: b/d, p/g, g/q, t/f.
- Able to trace objects.
- Folds and cuts paper into simple shapes.
- Can Tie Laces, string (like shoes).

Language

- Can identify right and left hands fairly consistently.
- Holds onto positive beliefs involving the unexplainable (magic or fantasy)
- Arrives at some understanding about death and dying; expresses fear that parents may die.
- Talks a lot.
- Loves telling jokes and riddles; often, the humor is far from subtle.
- Experiments with slang and profanity and finds it funny.
- Enthusiastic and inquisitive about surroundings and everyday events.
- Able to carry on adult-like conversations; asks many questions.
- Learns 5 to 10 words a day; vocabulary of 10,000-14,000.
- Uses appropriate verb tenses, word order, and sentence structure.
- Uses Language rather than tantrums or Physical aggression to express displeasure: "That's mine! Give it back, you dummy."
- Talks self through steps required in simple problem-solving situations (though the "logic" may be unclear to adults).
- Has mood swings towards primary caregiver depending on the day
- Friendship with parent is less depended on but still needs closeness and nurturing.
- Anxious to please; needs and seeks adult approval, reassurance, and praise; may complain excessively about minor hurts to gain more attention.
- Often can't view the world from another's point of view
- Self-perceived failure can make the child easily disappointed and frustrated.
- Can't handle things not going their own way
- Does not understand ethical behavior or moral standards especially when doing things that have not been given rules
- Understands when he or she has been thought to be "bad"; values are based on others enforced values.
- May be increasingly fearful of the unknown like things in the dark, noises, and animals.

See also

- Attachment Theory
- → Infant vision
- → Attachment in children
- Child development

References

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Segal, Marilyn (1998). *Your Child At Play: Three to Five Years* (http:/ / www. eric. ed. gov/ ERICWebPortal/ custom/ portlets/ recordDetails/ detailmini. jsp?_nfpb=true& _& ERICExtSearch_SearchValue_0=ED425832& ERICExtSearch_SearchType_0=no& accno=ED425832). New York: Newmarket Press. pp. 292. ISBN 1-55704-337-X.

External links

- CDC's "Learn the Signs. Act Early." campaign (http://www.cdc.gov/ncbddd/autism/actearly/screening.html) - Information for parents on early childhood development and developmental disabilities
- Developmental Milestones (http://www.nichcy.org/Disabilities/Milestones/Pages/Default.aspx) National Dissemination Center for Children with Disabilities, NICHCY
- YourChild: Developmental Milestones (http://www.med.umich.edu/yourchild/topics/devmile.htm) University of Michigan Health System
- Talking Point (http://www.talkingpoint.org.uk) - Information for parents and people that work with children, including milestones for speech and language development in children

Attachment theory

Attachment theory is a psychological, evolutionary and ethological theory concerning relationships between humans. The most important tenet of attachment theory is that a young child needs to develop a relationship with at least one primary caregiver for social and emotional development to occur normally. The theory was formulated by psychiatrist and psychoanalyst John Bowlby.[1]

Within attachment theory, infant behaviour associated with attachment is primarily the seeking of proximity to an attachment figure in stressful situations. Infants become attached to adults who are sensitive and responsive in social interactions with them,

For infants and toddlers, the "set-goal" of the attachment behavioural system is to maintain or achieve proximity to attachment figures, usually the parents.

and who remain as consistent caregivers for some months during the period from about six months to two years of age. During the latter part of this period, children begin to use attachment figures (familiar people) as a secure base to explore from and return to. Parental responses lead to the development of patterns of attachment which in turn lead to internal working models which will guide the individual's feelings, thoughts and expectations in later relationships.[2] Separation anxiety or grief following the loss of an attachment figure is considered to be a normal and adaptive response for an attached infant. These behaviours may have evolved because they increase the probability of survival of the child.[3]

Research by developmental psychologist Mary Ainsworth underpinned the basic concepts, introduced the concept of the "secure base" and developed a theory of a number of attachment patterns in infants: secure attachment, avoidant attachment and anxious attachment.[4] A fourth pattern, disorganised attachment, was identified later. Theorists extended attachment theory to adults.[5] Other interactions may be construed as including components of attachment behaviour; these include peer relationships at all ages, romantic and sexual attraction and responses to the care needs of infants or sick or elderly adults.

To formulate a comprehensive theory of the nature of early attachments, Bowlby explored a range of fields, including evolutionary biology, object relations theory (a tenet of psychoanalysis), control systems theory, and the fields of ethology and cognitive psychology.[6] After preliminary papers from 1958 onwards, Bowlby published the full theory in the trilogy *Attachment and Loss* (1969–82). In the early days of the theory, academic psychologists criticized Bowlby, and the psychoanalytic community ostracised him for his departure from psychoanalytical tenets;[7] however, attachment theory has since become the dominant approach to understanding early social development, and has given rise to a great surge of empirical research into the formation of children's close relationships.[8] Later criticism of attachment theory has come from a variety of disciplines. Attachment theory has been significantly modified as a result of empirical research, but the concepts have become generally accepted.[7] Attachment theory has formed the basis of new therapies and informed existing ones, and its concepts have been used in the formulation of social and childcare policies to support the early attachment relationships of children.[9]
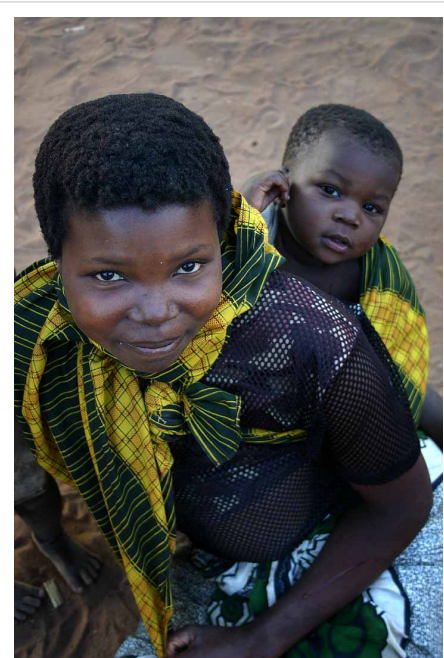
Attachment

Within attachment theory, *attachment* means a bond or tie between an individual and an attachment figure (usually a caregiver). Such bonds may be reciprocal and mutual between two adults, but are based on the need for safety, security and protection between a child and a caregiver. Such a need is paramount in infancy and childhood. The theory proposes that children attach to carers instinctively,[10] for the purpose of survival and, ultimately, genetic replication.[11] The biological function is survival and the psychological function is security.[8] Attachment theory is not an exhaustive description of human relationships, nor is it synonymous with love and affection, although these may indicate that bonds exist. In child-to-adult relationships, the child's tie is called the "attachment" and the caregiver's reciprocal equivalent is referred to as the "care-giving bond".[11]

Infants will form attachments to any consistent caregiver who is sensitive and responsive in social interactions with them. The quality of the social engagement appears to be more influential than amount of time spent. The biological mother is the usual principal attachment figure, but the role can be taken by anybody who behaves in a "mothering" way over a consistent period. Within attachment theory this means a set of behaviours that involves engaging in lively social

Although it is usual for the mother to be the primary attachment figure, infants will form attachments to any carer who is sensitive and responsive in social interactions with them.

interaction with the infant and responding readily to signals and approaches.[12] Nothing in the theory suggests that fathers are not equally likely to become principal attachment figures if they happen to provide most of the child care and related social interaction.[13]

Almost from the first, many children have more than one figure towards whom they direct attachment behaviour (proximity seeking). These figures are arranged in hierarchical order with the "principal attachment figure" at the top.[14] The set-goal of the attachment behavioural system is maintaining a bond with an accessible and available attachment figure.[15] If the figure is unavailable or unresponsive, separation distress occurs. The anticipation of such an occurrence arouses separation anxiety. Bowlby distinguished between alarm and anxiety: "alarm" was the term for activation of the attachment behavioural system caused by fear of danger, while "anxiety" was the fear of being cut off from the attachment figure (caregiver).[16] In infants, physical separation can cause firstly anxiety and anger, and then sadness and despair.

By age three or four, physical separation is no longer such a threat to the child's bond with the attachment figure. Threats to security in older children and adults arise from prolonged absence, break-downs in communication, emotional unavailability or signs of rejection or abandonment.[15]

Attachment behaviours

The attachment behavioural system serves to maintain or achieve closer proximity to the attachment figure.[17]

Insecure attachment patterns can compromise exploration and the achievement of self-confidence. This baby is free to concentrate on his book.

Pre-attachment behaviours occur in the first six months. During the first phase, the first eight weeks, infants smile, babble and cry to attract the attention of caregivers. Although babies are learning to discriminate between caregivers, these behaviours are directed at anyone in the vicinity. During the second phase, two to six months, the infant increasingly discriminates between familiar and unfamiliar adults, becoming more responsive towards the caregiver. Following and clinging is added to its repertoire. Clear-cut attachment develops in the third phase, between the ages of six months and two years. The infant's behaviour towards the caregiver becomes organised on a goal-directed basis to achieve the conditions that make it feel secure.[18] By the end of the first year the infant is able to display a range of attachment behaviours designed to maintain proximity. These manifest as protesting the caregiver's departure, greeting the caregiver's return, clinging when frightened and following when able.[19] With the development of locomotion the infant begins to use the caregiver or caregivers as a safe base from which to explore.[18] Infant exploration is greater when the caregiver is present because the infant's attachment system is relaxed and it is free to explore. If the caregiver is inaccessible or unresponsive, attachment behaviour is strongly activated.[20] Anxiety, fear, illness and fatigue will cause a child to increase attachment behaviours.[21] Many attachment behaviours occur only in threatening or uncomfortable circumstances such as the approach of an unfamiliar person (stranger wariness). It may be impossible to measure the presence of attachment without creating such circumstances.[22] After the second year, as the child begins to see the carer as an independent person, a more complex, goal-corrected partnership is formed.[23] Whereas babies will cry because of pain, two-year-olds will cry to summon their caregiver and if that does not work, cry louder or shout or follow. Children also begin to notice others' goals and feelings, planning their actions accordingly.[8]

Tenets

Common human attachment behaviours and emotions are adaptive. Human evolution has involved selection for social behaviours that make individual or group survival more likely. The commonly observed attachment behaviour of toddlers of staying near familiar people would have had safety advantages in the environment of early adaptation and has such advantages today. Bowlby saw the environment of early adaptation as similar to current hunter gatherer societies.[24] There is a survival advantage in the capacity to sense possibly dangerous conditions such as unfamiliarity, being alone or rapid approach. Bowlby termed proximity-seeking to the attachment figure in the face of threat to be the "set-goal" of the attachment behavioural system.[16]

The attachment system is very robust and young humans form attachments easily, even in far less than ideal circumstances.[25] In spite of the robustness of attachment, significant separation from a familiar caregiver, or frequent changes of caregiver that prevent development of attachment, may result in psychopathology at some point in later life.[25] Infants in their first months have no preference for their biological parents over strangers. Preferences for certain people, plus behaviours which solicit their attention and care are developed over a considerable period of time.[25] When an infant is upset by separation from their caregiver this indicates that the bond no longer depends on the presence of the caregiver but is of an enduring nature.[8]

Bowlby's original sensitivity period of between six months and two to three years has been modified to a less "all or nothing" approach. There is a sensitive period during which it is highly desirable that selective attachments develop but there is a broader time frame and less fixed and irreversible effects than first proposed. With further research, authors discussing attachment theory have come to appreciate that social development is affected by later as well as earlier relationships.[7] Early steps in attachment take place most easily if the infant has one caregiver, or the occasional care of a small number of other people.[25] According to Bowlby, almost from the first many children have more than one figure towards whom they direct attachment behaviour. These figures are not treated alike and there is a strong bias for a child to direct attachment behaviour mainly towards one particular person. Bowlby used the term "monotropy" to describe this bias.[26] Researchers and theorists have abandoned this concept insofar as it may be taken to mean that the relationship with the special figure differs *qualitatively* from that of other figures. Rather, current thinking postulates definite hierarchies of relationships.[7] [27]
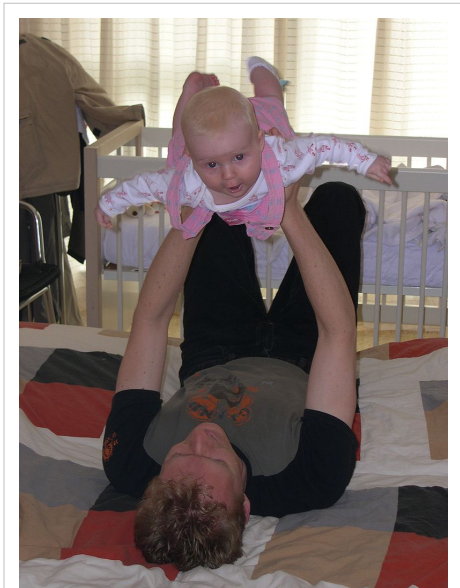
Early experiences with caregivers gradually give rise to a system of thoughts, memories, beliefs, expectations, emotions, and behaviours about the self and others.

Early experiences with caregivers gradually give rise to a system of thoughts, memories, beliefs, expectations, emotions, and behaviours about the self and others. This system, called the internal working model of social relationships, continues to develop with time and experience.[28] Internal models regulate, interpret and predict attachment related behaviour in the self and the attachment figure. As they develop in line with environmental and developmental changes, they incorporate the capacity to reflect and communicate about past and future attachment relationships.[2] They enable the child to handle new types of social interactions, for example; knowing an infant should be treated differently from an older child, or that interactions with teachers and parents share characteristics. An adult's internal working model continues to develop, helping cope with friendships, marriage and parenthood, all of which involve different behaviours and feelings.[29] [30] The development of attachment is a transactional process. Specific attachment behaviours begin with predictable, apparently innate, behaviours in infancy. They change with age in ways that are partly determined by experiences and partly by situational factors.[31] As attachment behaviours change with age, they do so in ways shaped by relationships. A child's behaviour when reunited with a caregiver is determined not only by how the caregiver has treated the child before, but on the history of effects the child has had on the caregiver.[32] [33]

Changes in attachment during childhood and adolescence

Age, cognitive growth and continued social experience advance the development and complexity of the internal working model. Attachment-related behaviours lose some characteristics typical of the infant-toddler period and take on age-related tendencies. The preschool period involves the use of negotiation and bargaining.[34] For example, four year-olds are not distressed by separation if they and their carer have already negotiated a shared plan for the separation and reunion.[35]

Peers become important in middle childhood and have an influence distinct from that of parents.

Ideally these social skills become incorporated into the internal working model to be used with other children and later with adult peers. As children move into the school years, most develop a goal-corrected partnership with parents, in which each partner is willing to compromise in order to maintain a gratifying relationship.[34] By middle childhood the goal of the attachment behavioural system has changed from proximity to the attachment figure to availability. Generally a child is content with longer separations provided contact or the possibility of reuniting, if needed, is available. There will be a decline in attachment behaviours like clinging and following, with an increase in self-reliance.[36] By middle childhood (ages 7−11) there may be a shift towards mutual co-regulation of secure-base contact.[34]

In early childhood, parental figures remain the centre of children's social worlds, even if they spend substantial periods of time in alternative care. This lessens, particularly with entrance into formal schooling.[36] Young children's attachment representations are typically assessed in relation to particular figures. It appears there are limitations in their thinking restricting their ability to integrate relationship experiences into a single general model. Children begin to develop a single general model of attachment relationships during adolescence, although this may occur in middle childhood.[36]

Relationships with peers have an influence distinct from parents but parent-child relationships can influence the peer relationships children form.[8] Although peers become important in middle childhood, the evidence suggests peers do not become attachment figures though children may direct attachment behaviours at peers if parental figures are unavailable. Attachments to peers tend to emerge in adolescence although parents continue as attachment figures.[36] With adolescents, the role of the caregiver is to be available when needed while the adolescent makes sorties into the outside world.[37]

Attachment patterns

Mary Ainsworth's innovative methodology and observational studies, particularly those undertaken in Scotland and Uganda, informed much of the theory. Her work expanded the theory's concepts and enabled its tenets to be empirically tested.[4] Using Bowlby's early formulation she conducted observational research on infant-parent dyads during the child's first year. She combined extensive home visits with the study of behaviours in particular situations. This early research was published in 1967 in *Infancy in Uganda*.[4] Ainsworth identified three attachment styles or patterns that a child may have with attachment figures: secure, anxious-avoidant (insecure) and anxious-ambivalent or resistant (insecure). She devised a procedure known as the Strange Situation Protocol as the laboratory portion of her larger study, to assess separation and reunion behaviour.[38] This is a standardised research tool used to assess attachment patterns in infants and toddlers. By creating stresses designed to activate attachment behaviour, the procedure reveals what use very young children make of their caregiver as a source of security.[8] Carer and child are placed in an unfamiliar playroom while a researcher records specific behaviours, observing through a one-way mirror. In eight different episodes the child experiences separation from/reunion with the carer and the presence of an unfamiliar stranger.[38]

Ainsworth's work in the USA attracted many scholars into the field, inspiring research and challenging the dominance of behaviouralism.[39] Further research by Dr. Mary Main and colleagues at the University of California, Berkeley identified a fourth attachment pattern, called disorganised/disoriented attachment. The name reflects these children's lack of a coherent coping strategy.[40]

The type of attachment developed by infants depends on the quality of care they have received.[41] Each of the attachment patterns is associated with certain characteristic patterns of behaviour, as described in the following table:

Child and caregiver behaviour patterns before the age of 18 months

Attachment pattern	Child	Caregiver
Secure	Uses caregiver as a secure base for exploration. Protests caregiver's departure and seeks proximity and is comforted on return, returning to exploration. May be comforted by the stranger but shows clear preference for the caregiver.	Responds appropriately, promptly and consistently to needs.
Avoidant	Little affective sharing in play. Little or no distress on departure, little or no visible response to return, ignoring or turning away with no effort to maintain contact if picked up. Treats the stranger similarly to the caregiver.	Little or no response to distressed child. Discourages crying and encourages independence.
Ambivalent/Resistant	Unable to use caregiver as a secure base, seeking proximity before separation occurs. Distressed on separation with ambivalence, anger, reluctance to warm to caregiver and return to play on return. Preoccupied with caregiver's availability, seeking contact but resisting angrily when it is achieved. Not easily calmed by stranger.	Inconsistent between appropriate and neglectful responses.
Disorganised	Stereotypies on return such as freezing or rocking. Lack of coherent attachment strategy shown by contradictory, disoriented behaviours such as approaching but with the back turned.	Frightened or frightening behaviour, intrusiveness, withdrawal, negativity, role confusion, affective communication errors and maltreatment.

The presence of an attachment and its quality are distinct. Infants form attachments if there is someone to interact with, even if mistreated. Individual differences in the relationships reflect the history of care as through repeated interactions infants begin to predict the behaviour of caregivers.[42] The focus is the organisation (pattern) rather than quantity of attachment behaviours. Insecure attachment patterns are non-optimal as they can compromise exploration, self-confidence and mastery of the environment. However, insecure patterns are also adaptive as they are suitable responses to the unresponsiveness of the caregivers. For example, in the avoidant pattern, minimising expressions of attachment even in conditions of mild threat may forestall alienating caregivers who are already rejecting thus leaving open the possibility of responsiveness should a more serious threat arise.[42]

In the general population about 65% of children will have a secure classification, with 35% being divided amongst the insecure classifications.[43] Recent research has sought to ascertain the extent to which a parent's attachment classification is predictive of their children's classification. It found that parents' perceptions of their own childhood attachments predicted their children's classifications 75% of the time.[44] [45] [46]

Over the short term, stability of attachment classifications is high but it becomes less so over the long term.[8] It appears stability of classification is linked to stability in caregiving conditions. Social stressors or negative life events such as illness, death, abuse or divorce are associated with instability of attachment patterns from infancy to early adulthood, particularly from secure to insecure.[47] Conversely, sometimes these difficulties reflect particular upheavals in people's lives which may change. Sometimes parents' responses change as the child develops, changing classification from insecure to secure. Fundamental changes can and do take place after the critical early period.[43] Physically abused and neglected children are less likely to develop secure attachments and their insecure classifications tend to persist through pre-school years. Neglect alone is associated with insecure attachment organisations. There are markedly elevated rates of disorganised attachment in maltreated infants.[41]

This situation is complicated by difficulties in assessing attachment classification in older age groups. The Strange Situation procedure is for ages 12 to 18 months only.[8] There are adapted versions for pre-school children.[48] Techniques have been developed to ascertain the child's state of mind with respect to attachment verbally. An example is the stem story in which a child is given the beginning of a story raising attachment issues and asked to complete it. For older children, adolescents and adults, semi-structured interviews are used in which the manner of relaying content may be as significant as the content itself.[8] However, there are no substantially validated measures of attachment in middle childhood or early adolescence (approximately 7 to 13 years of age).[48]

Some authors have questioned the idea that a taxonomy of categories representing qualitative difference in attachment relationships can be developed. Examination of data from 1,139 15-month-olds showed that variation was continuous rather than grouped.[49] This criticism introduces important questions for attachment typologies and the mechanisms behind apparent types. However, it has relatively little relevance for attachment theory itself, which "neither requires nor predicts discrete patterns of attachment".[50]

Significance of attachment patterns

There is an extensive body of research demonstrating a significant association between attachment organisations and children's functioning across multiple domains.[41] Early insecure attachment does not necessarily predict difficulties but it is a liability for the child, particularly if the parental behaviours continue throughout childhood.[43] Compared to securely attached children, the adjustment of insecure children in many spheres of life is not as soundly based, putting their future relationships in jeopardy. Although the link is not fully established by research and there are other influences besides attachment, secure infants are more likely to become more socially competent than their insecure peers. Relationships formed with peers influence the acquisition of social skills, intellectual development and the formation of social identity. Classification of children's peer status (popular, neglected or rejected) has been found to predict subsequent adjustment.[8] Insecure children, particularly avoidant children, are especially vulnerable to family risk. Their social and behavioural problems increase or decline with deterioration or improvement in parenting. However an early secure attachment appears to have a lasting protective function.[51] As with attachment to parental figures, subsequent experiences may alter the course of development.[8]

The most concerning pattern is disorganised attachment. About 80% of maltreated infants are likely to be classified as disorganised as opposed to about 12% found in non-maltreated samples. Only about 15% of maltreated infants are likely to be classified as secure. Children with a disorganised pattern in infancy tend to show markedly disturbed patterns of relationships. Their subsequent relationships with peers are often characterised by a "fight or flight" pattern of alternate aggression and withdrawal. Maltreated children are more likely to become maltreating parents, passing on the disordered relationship pattern. A minority do not, achieving instead secure attachments, good relationships with peers and non-abusive parenting styles.[8]

The link between insecure attachment, particularly the disorganised classification, and the emergence of childhood psychopathology is well-established although it is a non-specific risk factor for future problems, not a pathology or a direct cause of pathology in itself.[41] In the classroom, it appears that ambivalent children are at an elevated risk for internalizing disorders and avoidant and disorganised children for externalizing disorders.[51]

One explanation for the effects of early attachment classifications may lie in the internal working model mechanism. Internal models are not just "pictures" but refer to the feelings aroused. They enable a person to anticipate and interpret another's behaviour and plan a response. If an infant experiences their caregiver as a source of security and support, they are more likely to develop a positive self-image and expect positive reactions from others. Conversely a child from an abusive relationship may internalise a negative self-image and generalise negative expectations into other relationships. The internal working models on which attachment behaviour is based show a degree of continuity and stability. Children are likely to fall into the same categories as their primary caregivers indicating that the caregivers' internal working models affect the way they relate to their child. This effect has been observed to continue across three generations. Bowlby believed that the earliest models formed were the most likely to persist

because they existed outside consciousness. However such models are not impervious to change given further relationship experiences; a minority of children have different attachment classifications with different caregivers.[8]

There is some evidence that sex-differences in attachment patterns of adaptive significance begin to emerge in middle childhood. Insecure attachment and early psychosocial stress indicate environmental risk. This can tend to favour the development of strategies for earlier reproduction. However, different patterns have different adaptive values for males and females. Insecure males tend to adopt avoidant strategies whereas insecure females tend to adopt anxious/ambivalent strategies, unless they are in a very high risk environment. Adrenarche is proposed as the endocrine mechanism underlying the reorganization of insecure attachment in middle childhood.[47]

Attachment in adults

Attachment theory was extended to adult romantic relationships in the late 1980s by Cindy Hazan and Phillip Shaver. Four styles of attachment have been identified in adults: secure, anxious-preoccupied, dismissive-avoidant and fearful-avoidant. These roughly correspond to infant classifications: secure, insecure-ambivalent, insecure-avoidant and disorganised/disoriented.

Securely attached adults tend to have positive views of themselves, their partners and their relationships. They feel comfortable with intimacy and independence, balancing the two. Anxious-preoccupied adults seek high levels of intimacy, approval and responsiveness from partners, becoming overly dependent. They tend to be less trusting, having less positive views about themselves and their partners. They may exhibit high levels of emotional expressiveness, worry and impulsiveness in their relationships. Dismissive-avoidant adults desire a high level of independence, often appearing to avoid attachment altogether. They view themselves as self-sufficient, invulnerable to attachment feelings and not needing close relationships. They tend to suppress their feelings, dealing with rejection by distancing themselves from partners of whom they often have a poor view. Fearful-avoidant adults have mixed feelings about close relationships, both desiring and feeling uncomfortable with emotional closeness. They tend to mistrust their partners and view themselves as unworthy. Like dismissive-avoidant adults, fearful-avoidant adults tend to seek less intimacy, suppressing their feelings.[5] [52] [53] [54]

Two main aspects of adult attachment have been studied. The organisation and stability of the mental working models that underlie the attachment styles is explored by social psychologists interested in romantic attachment.[55] [56] Developmental psychologists interested in the individual's state of mind with respect to attachment generally explore how attachment functions in relationship dynamics and impacts relationship outcomes. The latter is more stable, while the former fluctuates more. Some authors have suggested that adults do not hold a single set of working models. Instead, on one level they have a set of rules and assumptions about attachment relationships in general. On another level they hold information about specific relationships or relationship events. Information at different levels need not be consistent. Individuals can therefore hold different internal working models for different relationships.[57] [56]
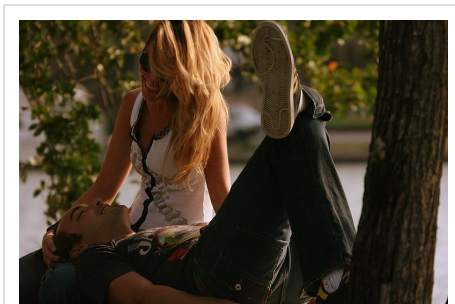
Each partner in a romantic relationship can display a different attachment style.

Attachment in adults is commonly measured using the Adult Attachment Interview[58] and self-report questionnaires. Self-report questionnaires have identified two dimensions of attachment, one dealing with anxiety about the relationship, the other with avoidance in the relationship.[5] For research a wide variety of measures are used, the most popular being the Experiences in Close Relationships-Revised scale.[59]

Recent developments

Whereas Bowlby was inspired by Piaget's insights into children's thinking, current attachment scholars utilise insights from contemporary literature on implicit knowledge, theory of mind, autobiographical memory and social representation.[60] Psychoanalyst/psychologist Peter Fonagy and Mary Target have attempted to bring attachment theory and psychoanalysis into a closer relationship through cognitive science as mentalization.[61] Mentalization, or theory of mind, is the capacity of human beings to guess with some accuracy what thoughts, emotions and intentions lie behind behaviours as subtle as facial expression.[62] This connection between theory of mind and the internal working model may open new areas of study leading to alterations in attachment theory.[63]

Authors considering attachment in non-western cultures have noted the connection of attachment theory with Western family and child care patterns characteristic of Bowlby's time.

One focus of attachment research has been the difficulties of children whose attachment history was poor, including those with extensive non-parental child care experiences. Concern with the effects of child care was intense during the so-called "day care wars" of the late 20th century, during which some authors stressed the deleterious effects of day care.[64] As a result of this controversy, training of child care professionals has come to stress attachment issues, including the need for relationship-building by the assignment of a child to a specific carer. Although only high-quality child care settings are likely to provide this, more infants in child care receive attachment-friendly care than in the past.[65]

Another significant area of research and development has been the connection between problematic attachment patterns, particularly disorganised attachment, and the risk of later psychopathology.[60] A third has been the effect on development of children having little or no opportunity to form attachments at all in their early years. A natural experiment permitted extensive study of attachment issues as researchers followed thousands of Romanian orphans adopted into Western families after the end of the Ceasescu regime. The English and Romanian Adoptees Study Team, led by Michael Rutter, followed some of the children into their teens, attempting to unravel the effects of poor attachment, adoption, new relationships, physical problems and medical issues associated with their early lives. Studies on these adoptees, whose initial conditions were shocking, yielded reason for optimism as many of the children developed quite well. Researchers noted that separation from familiar people is only one of many factors that help to determine the quality of development.[66] Although higher rates of atypical insecure attachment patterns were found compared to native born or early adopted samples, 70% of later adopted children did not exhibit marked or severe attachment disorder behaviours.[41]

Authors considering attachment in non-Western cultures have noted the connection of attachment theory with Western family and child care patterns characteristic of Bowlby's time.[67] As children's experience of care changes, attachment-related experiences may alter. For example, changes in attitudes toward female sexuality have greatly increased the numbers of children living with their never-married mothers or being cared for outside the home while the mothers work. This social change has made it more difficult for childless people to adopt infants in their own countries. There has been an increase in the number of older-child adoptions and adoptions from third-world sources in first-world countries. Adoptions and births to same-sex couples have increased in number and gained legal protection, compared to their status in Bowlby's time.[68] Issues have been raised to the effect that the dyadic model characteristic of attachment theory cannot address the complexity of real-life social experiences as infants often have multiple relationships within the family and in child care settings.[69]

History

Earlier theories

The concept of infants' emotional attachment to caregivers has been known anecdotally for hundreds of years. From the late nineteenth century onward, psychologists and psychiatrists suggested theories about attachment.[4] Early Freudian theory had little to say about a child's relationship with the mother, postulating only that the breast was the love object.[70] Freudians attributed the infant's attempts to stay near the familiar person to motivation learned through feeding and gratification of libidinal drives. In the 1930s, the British developmentalist Ian Suttie suggested that the child's need for affection was a primary one, not based on hunger or other physical gratifications.[71] William Blatz, a Canadian psychologist and teacher of Mary Ainsworth, also stressed the importance of social relationships for development. Blatz proposed that the need for security was a normal part of personality, as was the use of others as a secure base.[72] Observers from the 1940s onward focused on anxiety displayed by infants and toddlers threatened with separation from a familiar caregiver.[73] [74]

Another theory prevalent at the time of Bowlby's development of attachment theory was "dependency". This proposed that infants were dependent on adult caregivers but outgrew it. Thus attachment behaviour in older children would be seen as regressive. Attachment theory assumes older children and adults retain attachment behaviour, displaying it in stressful situations. Indeed, a secure attachment is associated with independent exploratory behaviour rather than dependence.[75] Bowlby developed attachment theory as a consequence of his dissatisfaction with existing theories of early relationships.[1]
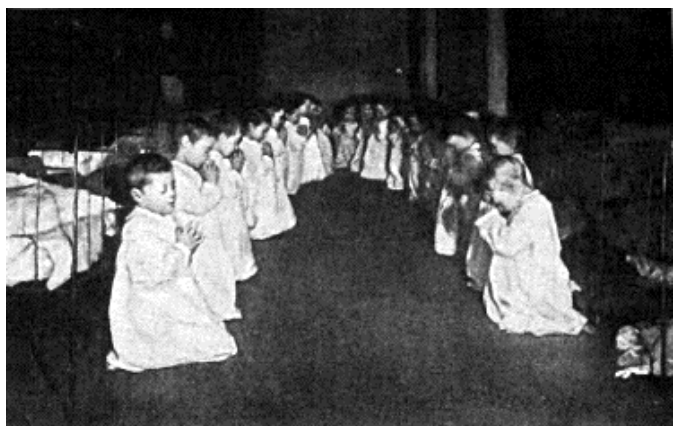
Early developments

The early thinking of the object relations school of psychoanalysis, particularly Melanie Klein, influenced Bowlby. However he profoundly disagreed with the prevalent psychoanalytic belief that infants' responses relate to their internal fantasy life rather than real-life events. As Bowlby formulated his concepts, he was influenced by case studies on disturbed and delinquent children, such as those of Goldfarb.[76] [77]

Bowlby's contemporary René Spitz observed separated children's grief, proposing that "psychotoxic" results where brought about by inappropriate experiences of early care.[78] [79] A strong influence was the work of social worker and psychoanalyst James Robertson who filmed the effects of separation on children in hospital. He and Bowlby collaborated in making the 1952 documentary film *A Two-Year Old Goes to the Hospital* which was instrumental in a campaign to alter hospital restrictions on visiting by parents.[80]


Prayer time in the Five Points House of Industry residential nursery, 1888. The maternal deprivation hypothesis published in 1951 caused a revolution in the use of residential nurseries.

In his 1951 monograph for the World Health Organisation, *Maternal Care and Mental Health*, Bowlby put forward the hypothesis that "the infant and young child should experience a warm, intimate, and continuous relationship with his mother (or permanent mother substitute) in which both find satisfaction and enjoyment", the lack of which may have significant and irreversible mental health consequences. This was also published as *Child Care and the Growth of Love* for public consumption. The central proposition was influential but highly controversial.[81] At the time there was limited empirical data and no comprehensive theory to account for

such a conclusion.[82] Nevertheless, Bowlby's theory sparked considerable interest and controversy in the nature of early relationships, giving a strong impetus to, (in the words of Mary Ainsworth), a "great body of research" in an extremely difficult, complex area.[81] Bowlby's work (and Robertson's films) caused a virtual revolution in hospital visiting by parents, hospital provision for children's play, educational and social needs and the use of residential nurseries. Over time, orphanages were abandoned in favour of foster care or family style homes in most developed countries.[83]

Formulation of the theory

Following the publication of *Maternal Care and Mental Health*, Bowlby sought new understanding from the fields of evolutionary biology, ethology, developmental psychology, cognitive science and control systems theory. He formulated the innovative proposition that mechanisms underlying an infant's tie emerged as a result of evolutionary pressure.[1] He set out to develop a theory of motivation and behaviour control built on science rather than the outdated psychic energy model espoused by Freud.[4] Bowlby argued that with attachment theory he had made good the "deficiencies of the data and the lack of theory to link alleged cause and effect" of *Maternal Care and Mental Health*.[84]
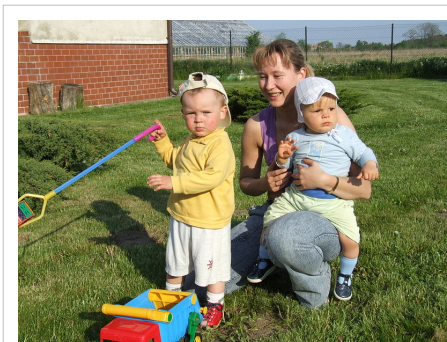
Infant exploration is greater when the caregiver is present; with the caregiver present, the infant's attachment system is relaxed and it is free to explore.

The formal origin of the theory began with the publication of two papers in 1958 the first being Bowlby's "The Nature of the Child's Tie to his Mother", in which the precursory concepts of "attachment" were introduced. The second was Harry Harlow's "The Nature of Love". This latter was based on experiments which showed that infant rhesus monkeys appeared to form an affectional bond with soft, cloth surrogate mothers that offered no food compared to wire surrogate mothers that provided a food source but were less pleasant to touch.[25] [85] [86] Bowlby followed up his first paper with two more; "Separation Anxiety" (1960a), and "Grief and Mourning in Infancy and Early Childhood" (1960b).[87] [88] At the same time, Bowlby's colleague Mary Ainsworth, with Bowlby's ethological theories in mind, was completing her extensive observational studies on the nature of infant attachments in Uganda.[4] Attachment theory was finally presented in 1969 in *Attachment*, the first volume of the *Attachment and Loss* trilogy. The second and third volumes, *Separation: Anxiety and Anger* and *Loss: Sadness and Depression* followed in 1972 and 1980 respectively. *Attachment* was revised in 1982 to incorporate later research.

Attachment theory came at a time when women were asserting their right to equality and independence, giving mothers new cause for anxiety. Attachment theory itself is not gender specific but in Western society it was largely mothers who bore responsibility for early child care. Those with political agendas interpreted the theory for their own purposes. Early opposition to attachment theory coalesced around this issue. Either mothers were seen as the problem, or attachment theory was seen as another vehicle for blaming overburdened mothers.[89]

Ethology

Bowlby's attention was first drawn to ethology when he read Konrad Lorenz's 1952 publication in draft form (although Lorenz had published earlier work).[90] Soon after, he encountered the work of Nikolaas Tinbergen and began to collaborate with Robert Hinde.[91] [92] In 1953 Bowlby stated "the time is ripe for a unification of psychoanalytic concepts with those of ethology, and to pursue the rich vein of research which this union suggests".[93] Konrad Lorenz had examined the phenomenon of "imprinting", a behaviour characteristic of some birds and mammals which involves rapid learning of recognition by the young, of a conspecific or comparable object. After recognition comes a tendency to follow.

The learning is possible only within a limited age range known as a critical period. Bowlby's concepts included the idea that attachment involved learning from experience during a limited age period, influenced by adult behaviour. He did not apply the imprinting concept in its entirety to human attachment. However, he considered that attachment behaviour was best explained as instinctive, combined with the effect of experience, stressing the readiness the child brings to social interactions.[94] Over time it became apparent there were more differences than similarities between attachment theory and imprinting so the analogy was dropped.[7]

This bottle-fed young moose has developed an attachment to its carer.

Ethologists expressed concern about the adequacy of some research on which attachment theory was based, particularly the generalisation to humans from animal studies.[95] [96] Schur, discussing Bowlby's use of ethological concepts (pre-1960) commented that concepts used in attachment theory had not kept up with changes in ethology itself.[97] Ethologists and others writing in the 1960s and 1970s questioned and expanded the types of behaviour used as indications of attachment.[98] Observational studies of young children in natural settings provided other behaviours that might indicate attachment; for example, staying within a predictable distance of the mother without effort on her part and picking up small objects, bringing them to the mother but not to others.[99] Although ethologists tended to be in agreement with Bowlby, they pressed for more data, objecting to psychologists writing as if there was an "entity which is 'attachment', existing over and above the observable measures."[100] Robert Hinde considered "attachment behaviour system" to be an appropriate term which did not offer the same problems "because it refers to postulated control systems that determine the relations between different kinds of behaviour."[101]

Psychoanalysis

Evacuation of smiling Japanese school children in World War II from the book *Road to Catastrophe*

Psychoanalytic concepts influenced Bowlby's view of attachment, in particular, the observations by Anna Freud and Dorothy Burlingham of young children separated from familiar caregivers during World War II.[102] However, Bowlby rejected psychoanalytical explanations for early infant bonds including "drive theory" in which the motivation for attachment derives from gratification of hunger and libidinal drives. He called this the "cupboard-love" theory of relationships. In his view it failed to see attachment as a psychological bond in its own right rather than an instinct derived from feeding or sexuality.[103] Thinking in terms of primary attachment and neo-Darwinism, Bowlby identified what he saw as fundamental flaws in psychoanalysis. Firstly the overemphasis of internal dangers at the expense of external threat.

Secondly the picture of the development of personality via linear "phases" with "regression" to fixed points accounting for psychological distress. Instead he posited that several lines of development were possible, the outcome of which depended on the interaction between the organism and the environment. In attachment this would mean that although a developing child has a propensity to form attachments, the nature of those attachments depends on the environment to which the child is exposed.[104]

From early in the development of attachment theory there was criticism of the theory's lack of congruence with various branches of psychoanalysis. Bowlby's decisions left him open to criticism from well-established thinkers working on similar problems.[105] [106] [107] Bowlby was effectively ostracized from the psychoanalytic community.[7]

Internal working model

Bowlby adopted the important concept of the internal working model of social relationships from the work of the philosopher Kenneth Craik. Craik had noted the adaptiveness of the ability of thought to predict events. He stressed the survival value of and natural selection for this ability. According to Craik, prediction occurs when a "small-scale model" consisting of brain events is used to represent not only the external environment, but the individual's own possible actions. This model allows a person to try out alternatives mentally, using knowledge of the past in responding to the present and future. At about the same time Bowlby was applying Craik's ideas to attachment, other psychologists were applying these concepts to adult perception and cognition.[108]

Cybernetics

The theory of control systems (cybernetics), developing during the 1930s and '40s, influenced Bowlby's thinking.[61] The young child's need for proximity to the attachment figure was seen as balancing homeostatically with the need for exploration. (Bowlby compared this process to physiological homeostasis whereby, for example, blood pressure is kept within limits). The actual distance maintained by the child would vary as the balance of needs changed. For example, the approach of a stranger, or an injury, would cause the child exploring at a distance to seek proximity. The child's goal is not an object (the caregiver) but a state; maintenance of the desired distance from the caregiver depending on circumstances.[1]

Cognitive development

Bowlby's reliance on Piaget's theory of cognitive development gave rise to questions about object permanence (the ability to remember an object that is temporarily absent) in early attachment behaviours. An infant's ability to discriminate strangers and react to the mother's absence seemed to occur months earlier than Piaget suggested would be cognitively possible.[109] More recently, it has been noted that the understanding of mental representation has advanced so much since Bowlby's day that present views can be more specific than those of Bowlby's time.[110]

Behaviourism

In 1969, Gerwitz discussed how mother and child could provide each other with positive reinforcement experiences through their mutual attention, thereby learning to stay close together. This explanation would make it unnecessary to posit innate human characteristics fostering attachment.[111] Learning theory, (behaviourism), saw attachment as a remnant of dependency with the quality of attachment being merely a response to the caregiver's cues. Behaviourists saw behaviours like crying as a random activity meaning nothing until reinforced by a caregiver's response. To behaviourists, frequent responses would result in more crying. To attachment theorists, crying is an inborn attachment behaviour to which the caregiver must respond if the infant is to develop emotional security. Conscientious responses produce security which enhances autonomy and results in less crying. Ainsworth's research in Baltimore supported the attachment theorists' view.[112]

In the last decade, behaviour analysts have constructed models of attachment based on the importance of contingent relationships. These behaviour analytic models have received some support from research[113] and meta-analytic reviews.[114]

Developments

As the formulation of attachment theory progressed, there was criticism of the empirical support for the theory. Possible alternative explanations for results of empirical research were proposed.[115] Some of Bowlby's interpretations of James Robertson's data were rejected by the researcher when he reported data from 13 young children cared for in ideal rather than institutional circumstances on separation from their mothers.[116] In the second volume of the trilogy, *Separation*, Bowlby acknowledged Robertson's study had caused him to modify his views on the traumatic consequences of separation in which insufficient weight had been given to the influence of skilled care from a familiar substitute.[117] In 1984 Skuse based criticism on the work of Anna Freud with children from

Theresienstadt who had apparently developed relatively normally despite serious deprivation in their early years. He concluded there was an excellent prognosis for children with this background, unless there were biological or genetic risk factors.[118]

Bowlby's arguments that even very young babies were social creatures and primary actors in creating relationships with parents took some time to be accepted. So did Ainsworth's emphasis on the importance and primacy of maternal attunement for psychological development (a point also argued by Donald Winnicott). In the 1970s Daniel Stern undertook research on the concept of attunement between very young infants and caregivers, using micro-analysis of video evidence. This added significantly to the understanding of the complexity of infant/caregiver interactions as an integral part of a baby's emotional and social development.[119]

In the 1970s, problems with viewing attachment as a trait (stable characteristic of an individual) rather than as a type of behaviour with organising functions and outcomes, led some authors to the conclusion that attachment behaviours were best understood in terms of their functions in the child's life.[120] This way of thinking saw the secure base concept as central to attachment theory's, logic, coherence and status as an organizational construct.[121] Following this argument, the assumption that attachment is expressed identically in all humans cross-culturally was examined.[122] The research showed that though there were cultural differences, the three basic patterns, secure, avoidant and ambivalent, can be found in every culture in which studies have been undertaken, even where communal sleeping arrangements are the norm.

Selection of the secure pattern is found in the majority of children across cultures studied. This follows logically from the fact that attachment theory provides for infants to adapt to changes in the environment, selecting optimal behavioural strategies.[123] How attachment is expressed shows cultural variations which need to be ascertained before studies can be undertaken; for example Gusii infants are greeted with a handshake rather than a hug. Securely attached Gusii infants anticipate and seek this contact. There are also differences in the distribution of insecure patterns based on cultural differences in child-rearing practices.[123]

Research indicates that attachment pattern distributions are consistent across cultures, although the manner in which attachment is expressed may differ.

The biggest challenge to the notion of the universality of attachment theory came from studies conducted in Japan where the concept of *amae* plays a prominent role in describing family relationships. Arguments revolved around the appropriateness of the use of the Strange Situation procedure where amae is practiced. Ultimately research tended to confirm the universality hypothesis of attachment theory.[123] Most recently a 2007 study conducted in Sapporo in Japan found attachment distributions consistent with global norms using the six-year Main & Cassidy scoring system for attachment classification.[124] [125]

Critics in the 1990s such as J. R. Harris, Stephen Pinker and Jerome Kagan were generally concerned with the concept of infant determinism (nature versus nurture), stressing the effects of later experience on personality.[126] [127] [128] Building on the work on temperament of Stella Chess, Kagan rejected almost every assumption on which attachment theory etiology was based. He argued that heredity was far more important than the transient effects of early environment. For example a child with an inherently difficult temperament would not elicit sensitive behavioural responses from a caregiver. The debate spawned considerable research and analysis of data from the growing number of longitudinal studies.[129] Subsequent research has not borne out Kagan's argument, broadly demonstrating that it is the caregiver's behaviours that form the child's attachment style, although how this style is expressed may differ with temperament.[130] Harris and Pinker put forward the notion that the influence of parents had been much exaggerated, arguing that socialisation took place primarily in peer groups. H. Rudolph Schaffer concluded that parents and peers had different functions, fulfilling distinctive roles in children's development.[131]

Biology of attachment

Attachment theory proposes that the quality of caregiving from at least the primary carer is key to attachment security or insecurity.[129] In addition to longitudinal studies, there has been psychophysiological research on the biology of attachment.[132] Research has begun to include behaviour genetics and temperament concepts.[130] Generally temperament and attachment constitute separate developmental domains, but aspects of both contribute to a range of interpersonal and intrapersonal developmental outcomes.[130] Some types of temperament may make some individuals susceptible to the stress of unpredictable or hostile relationships with caregivers in the early years.[133] In the absence of available and responsive caregivers it appears that some children are particularly vulnerable to developing attachment disorders.[134]

In psychophysiological research on attachment, the two main areas studied have been autonomic responses, such as heart rate or respiration, and the activity of the hypothalamic-pituitary-adrenal axis. Infants' physiological responses have been measured during the Strange Situation procedure looking at individual differences in infant temperament and the extent to which attachment acts as a moderator. There is some evidence that the quality of caregiving shapes the development of the neurological systems which regulate stress.[132]

Another issue is the role of inherited genetic factors in shaping attachments: for example one type of polymorphism of the DRD2 dopamine receptor gene has been linked to anxious attachment and another in the 5HT2A serotonin receptor gene with avoidant attachment.[135] This suggests that the influence of maternal care on attachment security is not the same for all children. One theoretical basis for this is that it makes biological sense for children to vary in their susceptibility to rearing influence.[64]

Practical applications

Child care policies

Social policies concerning the care of children were the driving force in Bowlby's development of attachment theory. The difficulty lies in applying attachment concepts to policy and practice.[136] This is because the theory emphasises the importance of continuity and sensitivity in caregiving relationships rather than a behavioural approach on stimulation or reinforcement of child behaviours.[137] In 2008 C.H. Zeanah and colleagues stated, "Supporting early child-parent relationships is an increasingly prominent goal of mental health practitioners, community based service providers and policy makers...Attachment theory and research have generated important findings concerning early child development and spurred the creation of programs to support early child-parent relationships".[9]

Historically, attachment theory had significant policy implications for hospitalised or institutionalised children, and those in poor quality daycare.[138] Controversy remains over whether non-maternal care, particularly in group settings, has deleterious effects on social development. It is plain from research that poor quality care carries risks but that those who experience good quality alternative care cope well although it is difficult to provide good quality, individualised care in group settings.[136]

Attachment theory has implications in residence and contact disputes,[138] and applications by foster parents to adopt foster children. In the past, particularly in North America, the main theoretical framework was psychoanalysis. Increasingly attachment theory has replaced it, thus focusing on the quality and continuity of caregiver relationships rather than economic well-being or automatic precedence of any one party, such as the biological mother. However, arguments tend to focus on whether children are "attached" or "bonded" to the disputing adults rather than the quality of attachments. Rutter noted that in the UK, since 1980, family courts have shifted considerably to recognize the complications of attachment relationships.[137] Children tend to have security-providing relationships with both parents and often grandparents or other relatives. Judgements need to take this into account along with the impact of step-families. Attachment theory has been crucial in highlighting the importance of social relationships in dynamic rather than fixed terms.[136]

Attachment theory can also inform decisions made in social work and court processes about foster care or other placements. Considering the child's attachment needs can help determine the level of risk posed by placement options.[139] Within adoption, the shift from "closed" to "open" adoptions and the importance of the search for biological parents would be expected on the basis of attachment theory. Many researchers in the field were strongly influenced by it.[136]

Clinical practice in children

Although attachment theory has become a major scientific theory of socioemotional development with one of the broadest, deepest research lines in modern psychology, attachment theory has, until recently, been less used in clinical practice than theories with far less empirical support.

In the early months of life, babies will direct attachment behaviours towards anyone in the vicinity. As attachment develops, so does age-appropriate "stranger wariness".

This may be partly due to lack of attention paid to clinical application by Bowlby himself and partly due to broader meanings of the word 'attachment' used amongst practitioners. It may also be partly due to the mistaken association of attachment theory with the pseudo-scientific interventions misleadingly known as attachment therapy.[140]

Prevention and treatment

In 1988 Bowlby published a series of lectures indicating how attachment theory and research could be used in understanding and treating child and family disorders. His focus for effecting change was the parents' internal working models, parenting behaviours and the parents' relationship with the therapeutic intervenor.[141] Ongoing research has led to a number of individual treatments and prevention and intervention programmes.[141] They range from individual therapy to public health programmes to interventions designed for foster carers. For infants and younger children the focus is on increasing the responsiveness and sensitivity of the caregiver, or if that is not possible, placing the child with a different caregiver.[142] [143] An assessment of the attachment status or caregiving responses of the caregiver is invariably included as attachment is a two-way process involving attachment behaviour and caregiver response. Some programmes are aimed at foster carers because the attachment behaviours of infants or children with attachment difficulties often do not elicit appropriate caregiver responses. Modern prevention and intervention programmes are mostly in the process of being evaluated.[144]

Reactive attachment disorder and attachment disorder

There is an atypical attachment pattern considered to be an actual disorder, known as reactive attachment disorder or RAD. This is a psychiatric diagnosis (ICD-10 F94.1/2 and DSM-IV-TR 313.89). The essential feature of reactive attachment disorder is markedly disturbed and developmentally inappropriate social relatedness in most contexts that begins before age five years, associated with gross pathological care. There are two subtypes, one reflecting a disinhibited attachment pattern, the other an inhibited pattern. RAD is not a description of insecure attachment styles, however problematic those styles may be; instead, it denotes a lack of age-appropriate attachment behaviours that amounts to a clinical disorder.[145] It is thought to be rare, despite the popularisation of the term "reactive attachment disorder" on the Web in connection with the pseudoscientific attachment therapy, for perceived behavioural difficulties outside the DSM or ICD criteria.[146]

Attachment disorder is an ambiguous term, which may be used to refer to reactive attachment disorder or to the more problematical insecure attachment styles although none of these are clinical disorders. It is also used within attachment therapy, as a form of unvalidated diagnosis.[146] It may also be used to refer to proposed new classification systems put forward by theorists in the field.

Clinical practice in adults and families

As attachment theory offers a broad, far-reaching view of human functioning, it can enrich a therapist's understanding of patients and the therapeutic relationship rather than dictate a particular form of treatment.[147] Some forms of psychoanalysis-based therapy for adults—within relational psychoanalysis and other approaches—also incorporate attachment theory and patterns.[147] [148] In the 2000s, key concepts of attachment were incorporated into existing models of behavioural couple therapy, multidimensional family therapy and couple and family therapy. Specifically attachment-centred interventions have been developed, such as attachment-based family therapy and emotionally focused therapy.[149] [150]

Attachment theory and research laid the foundation for the development of the understanding of "mentalization" or reflective functioning and its presence, absence or distortion in psychopathology. The dynamics of an individual's attachment organization and their capacity for mentalization can play a crucial role in the capacity to be helped by treatment.[147] [151]

See also

- Attachment parenting
- Cinderella effect
- Family therapy
- Human bonding

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[10] Bretherton I (1992). *The Origins of Attachment Theory: John Bowlby and Mary Ainsworth*. "[Bowlby] begins by noting that organisms at different levels of the phylogenetic scale regulate instinctive behavior in distinct ways, ranging from primitive reflex-like "fixed action patterns" to complex plan hierarchies with subgoals and strong learning components. In the most complex organisms, instinctive behaviors may be "goal-corrected" with continual on-course adjustments (such as a bird of prey adjusting its flight to the movements of the prey). The concept of cybernetically controlled behavioral systems organized as plan hierarchies (Miller, Galanter, & Pribram, 1960) thus came to replace Freud's concept of drive and instinct. Such systems regulate behaviors in ways that need not be rigidly innate, but - depending on the organism - can adapt in greater or lesser degrees to changes in environmental circumstances, provided that these do not deviate too much from the organism's environment of evolutionary adaptedness. Such flexible organisms pay a price, however, because adaptable behavioral systems can more easily be subverted from their optimal path of development. For humans, Bowlby speculates, the environment of evolutionary adaptedness probably resembles that of present-day hunter-gatherer societies.".

[11] Prior and Glaser p. 15.

[12] Bowlby (1969) p. 365.

[13] Holmes p. 69.

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[16] Prior and Glaser p. 16.

[17] Prior and Glaser p. 17.

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Attachment in children

Attachment in children is a theory of attachment between children and their caregivers specifically addressing the behaviors and emotions that children direct toward familiar adults. It is primarily an evolutionary and ethological theory postulating that infants seek *proximity* to a *specified* attachment figure in situations of distress or alarm for the purpose of survival.[1]

Attachment theory has led to a new understanding of child development. Children develop different styles of attachment based on experiences and interactions with their caregivers. Four different attachment *styles* or *patterns* have been identified in

Mother and child

children: secure, anxious-ambivalent, anxious-avoidant, and disorganized. Attachment theory has become the dominant theory used today in the study of infant and toddler behavior and in the fields of infant mental health, treatment of children, and related fields.

Attachment Theory and Children

→ Attachment theory (Bowlby 1969, 1973, 1980) is rooted in the ethological notion that a newborn child is biologically programmed to seek proximity with caregivers, and this proximity-seeking behavior is naturally selected.[2] [3] [4] Through repeated attempts to seek physical and emotional closeness with a caregiver and the responses the child gets, the child develops an internal working model (IWM) of the self and others that reflects the response of the caregiver to the child. According to Bowlby, attachment provides a secure base from which the child can explore the environment, a haven of safety to which the child can return when he or she is afraid or fearful.

An infant may have different patterns of attachment with different care-givers. By around age five years, this "crystalizes" into one pattern of attachment that is generally exhibited within most relationships.[5]

Attachment classification in children: The Strange Situation Protocol

The most common and empirically supported method for assessing attachment in infants (12months-20months) is the Strange Situation Protocol, developed by Mary Ainsworth (see below).[6] The Strange Situation Protocol is a research, not a diagnostic, tool and the resulting attachment classifications are not 'clinical diagnoses.' While the procedure may be used to supplement clinical impressions, the resulting classifications should not be confused with the clinically diagnosed 'Reactive Attachment Disorder (RAD).' The clinical concept of RAD differs in a number of fundamental ways from the theory and research driven attachment classifications based on the Strange Situation Procedure. The idea that insecure attachments are synonymous with RAD is, in fact, not accurate and leads to ambiguity when formally discussing attachment theory as it has evolved in the research literature. This is not to suggest that the concept of RAD is without merit, but rather that the clinical and research conceptualizations of insecure attachment and attachment disorder are not synonymous.

The 'Strange Situation' is a laboratory procedure used to assess infant patterns of attachment to their caregiver. In the procedure, the mother and infant are placed in an unfamiliar playroom equipped with toys while a researcher observes/records the procedure through a one-way mirror. The procedure consists of eight sequential episodes in which the child experiences both separation from and reunion with the mother as well as the presence of an unfamiliar stranger.[6] The protocol is conducted in the following format unless modifications are otherwise noted by a particular researcher:

Episode 1: Mother (or other familiar caregiver), Baby, Experimenter (30 seconds)

Episode 2: Mother, Baby (3 mins)

Episode 3: Mother, Baby, Stranger (3 mins or less)

Episode 4: Stranger, Baby (3 mins)

Episode 5: Mother, Baby (3 mins)

Episode 6: Baby Alone (3 mins or less)

Episode 7: Stranger, Baby (3 mins or less)

Episode 8: Mother, Baby (3 mins)

On the basis of predominately their reunion behaviours (although other behaviors are taken into account) in the Strange Situation Paradigm (Ainsworth et al., 1978; see below), infants can be categorized into three 'organized' attachment categories: Secure (Group B); Avoidant (Group A); and Anxious/Resistant (Group C). There are subclassifications for each group (see below). A fourth category, termed Disorganized (D), can also be assigned to an infant assessed in the Strange Situation although a primary 'organized' classification is always given for an infant judged to be disorganized. Each of these groups reflects a different kind of attachment relationship with the mother. A child may have a different type of attachment to each parent as well as to unrelated caregivers. Attachment style is thus not so much a part of the child's thinking, but is characteristic of a specific relationship. However, after about age four the child exhibits one primary consistent pattern of attachment in relationships.[7]

Secure attachment

A toddler who is securely attached to its parent (or other familiar caregiver) will explore freely while the parent is present, typically engages with strangers, is often visibly upset when the parent departs, and is generally happy to see the parent return. The extent of exploration and of distress are affected by the child's temperamental make-up and by situational factors as well as by attachment status, however.

In the traditional Ainsworth et al. (1978) coding of the Strange Situation, secure infants are denoted as "Group B" infants and they are further subclassified as B1, B2, B3, and B4.[6] Although these subgroupings refer to different stylistic responses to the comings and goings of the caregiver, they were not given specific labels by Ainsworth and colleagues, although their descriptive behaviors led others (including students of Ainsworth) to devise a relatively 'loose' terminology for these subgroups. B1's have been referred to as 'secure-reserved', B2's as 'secure-inhibited', B3's as 'secure balanced,' and B4's as 'secure-reactive.' In academic publications however, the classification of infants (if subgroups are denoted) is typically simply "B1" or "B2" although more theoretical and review-oriented papers surrounding attachment theory may use the above terminology.

Securely attached children are best able to explore when they have the knowledge of a secure base to return to in times of need. When assistance is given, this bolsters the sense of security and also, assuming the parent's assistance is helpful, educates the child in how to cope with the same problem in the future. Therefore, secure attachment can be seen as the most adaptive attachment style. According to some psychological researchers, a child becomes securely attached when the parent is available and able to meet the needs of the child in a responsive and appropriate manner. Others have pointed out that there are also other determinants of the child's attachment, and that behavior of the parent may in turn be influenced by the child's behavior.

Anxious-resistant insecure attachment

In general, a child with an anxious-resistant attachment style will typically explore little (in the Strange Situation) and is often wary of strangers, even when the parent is present. When the mother departs, the child is often highly distressed. The child is generally ambivalent when she returns. In the traditional Ainsworth et al. (1978) coding of the Strange Situation, anxious-resistant infants are denoted as "Group C" infants and they are further subclassified into C1 and C2 infants.[6] C1 infants are so judged when:

"...resistant behavior is particularly conspicuous. The mixture of seeking and yet resisting contact and interaction has an unmistakeably angry quality and indeed an angry tone may characterize behavior in the preseparation episodes..."[6]

C2 infants are often seen as demonstrating 'passive' resistance. As Ainsworth et al. (1978) originally noted:

"Perhaps the most conspicuous characteristic of C2 infants is their passivity. Their exploratory behavior is limited throughout the SS and their interactive behaviors are relatively lacking in active initiation. Nevertheless, in the reunion episodes they obviously want proximity to and contact with their mothers, even though they tend to use signalling rather than active approach, and protest against being put down rather than actively resisting release...In general the C2 baby is not as conspicuously angry as the C1 baby."[6]

Anxious-avoidant insecure attachment

In general, a child with an anxious-avoidant attachment style will avoid or ignore the parent when he or she returns (in the Strange Situation) - showing little overt indications of an emotional response. Often, the stranger will not be treated much differently from the parent. In the traditional Ainsworth et al. (1978) coding of the Strange Situation, anxious-avoidant infants are denoted as "Group A" infants and they are further subclassified into A1 and A2 infants.[6] A1 infants are so judged when there is:

"...conspicuous avoidance of the mother in the reunion episodes which is likely to consist of ignoring her altogether, although there may be some pointed looking away, turning away, or moving away...If there is a greeting when the mother enters, it tends to be a mere look or a smile...Either the baby does not approach his mother upon reunion, or they approach in 'abortive' fashions with the baby going past the mother, or it tends to only occur after much coaxing...If picked up, the baby shows little or no contact-maintaining behavior; he tends not to cuddle in; he looks away and he may squirm to get down."[6]

A2 infants are often seen as demonstrating a mixture of both some avoidance and resistance. Often, though not always, A2 infants are judged Disorganized (D). As Ainsworth et al. (1978) originally noted:

"...[the A2 infant] shows a mixed response to mother on reunion, with some tendency to greet and approach, intermingled with a marked tendency to move or turn away from her, move past her, avert the gaze from her, or ignore her...there may be moderate proximity-seeking, combined with strong proximity-avoiding...If picked up, the baby may cling momentarily; if put down, he may protest or resist momentarily; but there is also a tendency to squirm to be put down, to turn the face away when being held and other signs of mixed feelings [i.e., resistance/ambivalence]."[6]

Disorganized attachment

A fourth category termed disorganized attachment (Main & Solomon, 1990) was subsequently identified and empiricized when a sizeable number of infants defied classification in terms of Ainsworth's original tripartite classification scheme.[8] It can be conceptualized as the *lack* of a coherent 'organized' behavioral strategy for dealing with the stresses (i.e., the strange room, the stranger, and the comings and goings of the caregiver) of the Strange Situation Procedure. Evidence from Main et al. has suggested that children with disorganized attachment may experience their caregivers as either frightening or frightened. A frightened caregiver is alarming to the child, who uses social referencing techniques such as checking the adult's facial expression to ascertain whether a situation is safe. A frightening caregiver is usually so via aggressive behaviors towards the child (either mild or direct physical/sexual behaviors) and puts the child in a dilemma which Main and colleagues have called 'fear without solution.' In other words, the caregiver is both the source of the child's alarm as well as the child's haven of safety. Through parental behaviors that are frightening, the caregiver puts the child in an irresolvable paradox of approach-avoidance. This paradox, in fact, may be one explanation for some of the 'stilling' and 'freezing' behaviors observed in children judged to be disorganized. Human interactions are experienced as erratic, thus children cannot form a coherent, organized interactive template. If the child uses the caregiver as a mirror to understand the self, the

disorganized child is looking into a mirror broken into a thousand pieces. It is more severe than learned helplessness as it is the model of the self rather than of a situation. It is important to note that when a child is judged disorganized, he or she is given a secondary best-fitting 'organized' (i.e., secure, ambivalent, avoidant) classification as well. This reflects the fact that attachment disorganization is thought to be a breakdown of an inchoate organized attachment strategy. The degree to which the organized strategy is fragmented however is often different in degree across infants judged to receive a primary 'disorganized' classification.

There is a growing body of research on the links between abnormal parenting, disorganized attachment and risks for later psychopathologies.[9] Abuse is associated with disorganized attachment.[10] [11] The disorganized style is a risk factor for a range of psychological disorders although it is not in itself considered an attachment disorder under the current classification.[12] [13]

Significance of patterns

Research based on data from longitudinal studies, such as the National Institute of Child Health and Human Development Study of Early Child Care and the Minnesota Study of Risk and Adaption from Birth to Adulthood, and from cross-sectional studies, consistently shows associations between early attachment classifications and peer relationships as to both quantity and quality. Predictions are stronger for close relationships that for less intimate ones. Secure children have more positive and fewer negative peer reactions and establish more and better friendships. Insecure children tend to be followers rather than leaders. Insecure-ambivalent children have a tendency to anxiously but unsuccessfully seek positive peer interaction whereas insecure-avoidant children appear aggressive and hostile and may actively repudiate positive peer interaction. There is no established direct association between early experience and a comprehensive measure of social functioning in early adulthood but early experience significantly predicts early childhood representations of relationships, which in turn predicts later self and relationship representations and social behaviour. Behavioural problems and social competence in insecure children increase or decline with deterioration or improvement in quality of parenting and the degree of risk in the family environment. Avoidant children are especially vulnerable to family risk. However an early secure attachment appears to have a lasting protective function.[14]

Criticism

Michael Rutter describes the procedure in the following terms:[15]

"It is by no means free of limitations (see Lamb, Thompson, Gardener, Charnov & Estes, 1984).[16] To begin with, it is very dependent on brief
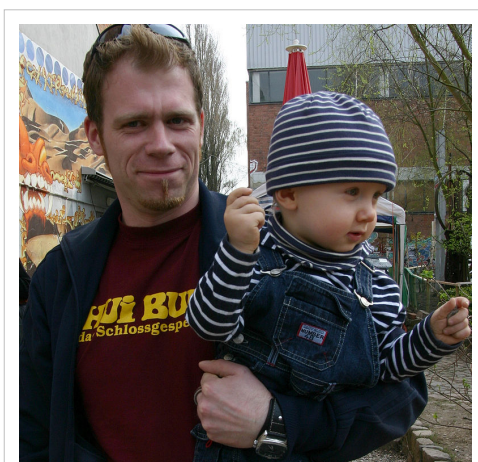
Father and child

separations and reunions having the same meaning for all children. This maybe a major constraint when applying the procedure in cultures, such as that in Japan (see Miyake et al., 1985), where infants are rarely separated from their mothers in ordinary circumstances.[17] Also, because older children have a cognitive capacity to maintain relationships when the older person is not present, separation may not provide the same stress for them. Modified procedures based on the Strange Situation have been developed for older preschool children (see Belsky et al., 1994; Greenberg et al., 1990) but it is much more dubious whether the same approach can be used in middle childhood.[18] [19] Also, despite its manifest strengths, the procedure is based on just 20 minutes of behaviour. It can

be scarcely expected to tap all the relevant qualities of a child's attachment relationships. Q-sort procedures based on much longer naturalistic observations in the home, and interviews with the mothers have developed in order to extend the data base (see Vaughn & Waters, 1990).[20] A further constraint is that the coding procedure results in discrete categories rather than continuously distributed dimensions. Not only is this likely to provide boundary problems, but also it is not at all obvious that discrete categories best represent the concepts that are inherent in attachment security. It seems much more likely that infants vary in their degree of security and there is need for a measurement systems that can quantify individual variation".

Ecological validity and universality of Strange Situation attachment classification distributions

With respect to the ecological validity of the Strange Situation, a meta-analysis of 2,000 infant-parent dyads, including several from studies with non-Western language and/or cultural bases found the global distribution of attachment categorizations to be A (21%), B (65%), and C (14%).[21] This global distribution was generally consistent with Ainsworth et al.'s (1978) original attachment classification distributions.

However, controversy has been raised over a few cultural differences in these rates of 'global' attachment classification distributions. In particular, two studies diverged from the global distributions of attachment classifications noted above. One study was conducted in North Germany in which more avoidant (A) infants were found than global norms would suggest, and the other in Sapporo, Japan, where more resistant (C) infants were found.[22] [23] Of these two studies, the Japanese findings have sparked the most controversy as to the meaning of individual differences in attachment behavior as originally identified by Ainsworth et al. (1978).

In a recent study conducted in Sapporo, Behrens et al. (2007) found attachment distributions consistent with global norms using the six-year Main & Cassidy scoring system for attachment classification.[24] [25] In addition to these findings supporting the global distributions of attachment classifications in Sapporo, Behrens et al. also discuss the Japanese concept of amae and its relevance to questions concerning whether the insecure-resistant (C) style of interaction may be engendered in Japanese infants as a result of the cultural practice of amae.

Attachment measurement: discrete or continuous?

Regarding the issue of whether the breadth of infant attachment functioning can be captured by a categorical classification scheme, it should be noted that continuous measures of attachment security have been developed which have demonstrated adequate psychometric properties. These have been used either individually or in conjunction with discrete attachment classifications in many published reports (see Richters et al., 1998; van Ijzendoorn et al., 1990).[26] [27] The original Richter's et al. (1998) scale is strongly related to secure versus insecure classifications, correctly predicting about 90% of cases.[27] Readers further interested in the categorical versus continuous nature of attachment classifications (and the debate surrounding this issue) should consult a paper by Fraley and Spieker and the rejoinders in the same issue by many prominent attachment researchers including J. Cassidy, A. Sroufe, E. Waters & T. Beauchaine, and M. Cummings.[28]

See also

- • → Attachment theory
- • Attachment in adults
- • Attachment measures
- • Attachment-based therapy (children)
- • Child psychotherapy
- • Attachment disorder
- • Reactive attachment disorder
- • Object relations theory
- • Affectional bond
- • Human bonding
- • Attachment therapy
- • Maternal deprivation

- • Mary Ainsworth
- • John Bowlby
- • Erik Erikson
- • Sigmund Freud
- • Jerome Kagan
- • Melanie Klein
- • Jean Piaget
- • Michael Rutter
- • Donald Winnicott
- • Behavior analysis of child development

Recommended Reading

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Infant vision

The science of **infant vision** gives a verifiable basis for some practices of pediatric ophthalmology and gathers measurements intended to describe, monitor and predict:

- development of retinal photoreceptor cells
- infant sensitivity to detail, color, contrast, and movement
- binocularity
- eye movements
- refraction
- cognitive processing

By establishing a timeline of visual perception development in "normal" babies and comparing such data with that of babies with visual "abnormalitites" it is hoped to further the understanding of the role of early visual development in the overall visual picture of sensory growth and change.

The newborn's visual acuity is approximately 20/400, and reaches 20/20 by age 2 years. [1]

See also

- Eye exam
- Orthoptist
- Pediatric ophthalmology

External links

- Boston Children's Hospital [2]
- Smith-Kettlewell Institute [3]
- University of Arizona [4]
- University of California, San Diego [5]
- University of Massachusetts Medical Center [6]

Reference Works

[1] Your Baby's Eyes (http://www.uic.edu/com/eye/LearningAboutVision/EyeFacts/BabyEyes.shtml)

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Nativism

Nativism may refer to:

- Nativism (politics) or *political nativism*, a term used by scholars to refer to ethnocentric beliefs relating to immigration and nationalism. In particular, it may refer to 19th and 20th century political movements in the United States, especially the Know Nothings in the 1850s and the KKK in the 1920s
- A second closely related use of the term refers to movements among indigenous minorities. In North America the 1762 Neolin, 1808 Tenskwatawa, 1889 Wovoka and the broader renewal prophecy movements are commonly refered to in this manner.
- Psychological nativism is a concept in psychology and philosophy which asserts certain concepts as being natural, hence "native" to a species.
- linguistic nativism, see Universal grammar
- bionativism, the idea that non-indigenous species (excluding humans) are inherently invasive or damaging to native ecosystems, and should be prevented or eradicated at all costs
- Innatism (philosophy)

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