

Infant Play*

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Introduction

Infant Play is an observational activity designed to give you insight into the remarkable changes taking place within infant minds as they gain experience with their physical and social worlds. The great pioneer in this area was Jean Piaget, who first mapped the terrain of infant cognitive development in his landmark book, *The origins of intelligence in children* (Piaget, 1952). Since Piaget's early work, there has been an explosion of research on the early development of cognitive abilities, but the broad outlines of Piaget's theory remain intact. One area of great interest to Piaget was children's play, and his observations of infant play were essential to his overall understanding of infant development. Several years later, Jay Belsky and Robert Most published a paper in the journal *Developmental Psychology* (Belsky & Most, 1981) that was based on Piaget's original observations, but that explored the early development of play with much greater methodological rigor (see *Observational Methods*). This activity is based on Belsky and Most's paper.

Piaget's Theory

You may recall from my Piaget lecture that Piaget's theory can be broken down into three main components, as follows:

- *General Concepts*: These are general principles and concepts that were the starting point for Piaget's thinking and research regarding

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children’s cognitive development; here are listed some of the most important of these concepts:

- *Genetic Epistemology*: It is important to realize that Piaget wasn’t trained as a psychologist (his formal training was in biology), and didn’t really consider himself a psychologist; instead, he considered himself a *genetic epistemologist*: someone who tries to understand the origins of human knowledge not with the methods of the philosophers, but with the methods of the naturalist; that is, by carefully observing the development of thought and knowledge in young humans (visit en.wikipedia.org for excellent articles about epistemology and Jean Piaget).
- *Intelligence and Adaptation*: Piaget’s genetic epistemology closely paralleled a contemporary development in psychology, namely the measurement and investigation of intelligence (in fact, one of Piaget’s early post-doctoral experiences was a stint in the laboratory of Binet and Simon, developers of the first intelligence test); Piaget viewed intelligence as a form of adaptation, and was known to have said “Intelligence is what you use when you don’t know what to do.”
- *Structuralism*: Piaget was a structuralist (see the Wikipedia for a good article on structuralism), and a major aspect of his theory was the description of cognitive structures such as *schemata* and *operations*; these structures reflect the organization of the mind’s functional capacities, and can be thought of as patterns of neural and/or behavioral activity; cognitive development can be viewed, at least in part, as the development of these mental structures.
- *Stages*: Roughly speaking, Piaget organized his career into two major periods: during the first period, he and his colleagues attempted to discover and describe the broad *stages* of cognitive development; during the second period, his research team attempted to understand the *mechanisms* of cognitive development—those processes by which children progressed from one stage to another. Piaget felt that cognitive development could be organized into four broad stages:
 1. *The Sensorimotor Stage* (0–2 years)
 2. *The Preoperational Stage* (2–5 years)
 3. *The Concrete Operational Stage* (6–12 years)
 4. *The Formal Operational Stage* (13–18 years)

- *Mechanisms*: Although Piaget felt that description of the stages was important, as a kind of road map of the developmental landscape, he felt that the most important task of genetic epistemology (and developmental psychology) was to understand the *mechanisms* which drove the development of cognitive structures; he proposed three main concepts in this regard, which are often referred to as the *functional invariants*:
 - *Equilibration*: For Piaget the driving force (motivation) for change is *disequilibrium*, usually caused by a contradiction between our experiences and our current cognitive structures; the process of regaining equilibrium can lead to a modification of our cognitive structures, and Piaget referred to this process as *equilibration*. Equilibration consists of two complementary cognitive processes, *assimilation* and *accomodation*, and is itself a form of *adaptation*.
 - *Assimilation* is the process of incorporating experience into existing cognitive structures; for example, if you give an infant a new rattle, he will assimilate it into his grasping and sucking schemata.
 - *Accodation* occurs if an existing cognitive structure is modified by an ongoing experience; in the example above, the grasping and sucking schemata might be modified if the rattle has a shape or texture that is novel.

The Sensorimotor Stage

Piaget broke the sensorimotor stage of development down into six substages, as can be seen in the outline below. An excellent resource for this information is John Flavell's classic text, *The developmental psychology of Jean Piaget* (Flavell, 1963). Flavell's book was instrumental in making Piaget's ideas accessible to English-speaking psychologists, for Piaget is difficult to read, and his books were originally published in French. In any case, there is only an outline presented here, for the material is covered in lecture. This is important background material for the Infant Play activity.

1. *The Use of Reflexes* (0–1 Month)
2. *The First Acquired Adaptations and the Primary Circular Reaction* (1–4 Months)
 - Imitation as Reproductive Assimilation

3. *The Secondary Circular Reaction and Procedures for Making Interesting Sights Last (4–8 Months)*
 - Reproductive Assimilation: The Secondary Circular Reaction
 - Recognitory Assimilation: Motor Recognition
 - Generalizing Assimilation: Procedures for Making Interesting Sights Last
 - The Problem of Intentionality
 - Appearance of the Deferred Circular Reaction (Primitive Object Concept)
 - Appearance of Play (Pure Assimilation as Distinguished from Adaptation)
4. *The Coordination of Secondary Schemas and Their Application to New Situations (8–12 Months)*
 - New Adaptations Through Coordination of Familiar Schemas
 - Exploration of New Objects
 - Imitation of Novel Behaviors
 - Object Permanence (A-not-B Error)
 - Appearance of Play Rituals (Assimilation vs Adaptation)
5. *The Tertiary Circular Reaction and the Discovery of New Means Through Active Experimentation (12–18 Months)*
6. *Invention of New Means through Mental Combinations (18–24 Months)*
 - Deferred Imitation
 - Mature Object Concept
 - Pretend Play

The Infant Play Scale

Jay Belsky and Robert Most are developmental psychologists at the Pennsylvania State University, a university highly regarded for its graduate programs in human development. In order to further investigate Piaget's ideas about the development of sensorimotor intelligence, Belsky and Most constructed a play scale, and tested it with a large sample of infants (Belsky & Most, 1981). Here I reproduce their play scale, which is based on their Table 1:

1. *Mouthing*—indiscriminate mouthing of materials (e.g., peg, seashell).
2. *Simple Manipulation*—visually guided manipulation (excluding indiscriminate banging and shaking) at least 5 sec in duration that cannot be coded in any other category (e.g., turn over an object, touch and look at an object).
3. *Functional*—visually guided manipulation that is particularly appropriate for a certain object and involves the intentional extraction of some unique information (e.g., turn dial on toy phone, squeeze piece of foam rubber, flip antenna of Busy Bee toy, spin wheels on cart, roll cart on wheels).
4. *Relational*—bringing together and integrating two or more materials in an inappropriate manner, that is, a manner not initially intended by the manufacturer (e.g., set cradle on phone, touch spoon to stick).
5. *Functional-Relational*—bringing together and integrating two objects in an appropriate manner, that is, in a manner intended by the manufacturer (e.g., set cup on saucer, place peg in hole of pegboard, mount spool on shaft of cart).
6. *Enactive Naming*—approximate pretense activity but without confirming evidence of actual pretense behavior (e.g., touch cup to lip without making drinking sounds, tilting head back, or tipping cup; raise phone receiver to proximity of ear without making talking sounds; touch brush to doll's hair without making combing motions).
7. *Pretend Self*—pretense behavior directed toward self in which pretense is apparent (e.g., raise cup to lip; tip cup, make drinking sounds, or tilt head; stroke own hair with miniature brush; raise phone receiver to ear and vocalize).
8. *Pretend Other*—pretense behavior directed away from child toward other (e.g., feed doll with spoon, bottle, or cup; brush doll's hair; push car on floor and make car noise).
9. *Substitution*—using a “meaningless” object in a creative or imaginative manner (e.g., drink from a seashell; feed baby with stick as “bottle”) or using an object in a pretense act in a way that differs from how it was previously used by the child (e.g., use hairbrush to brush teeth after already using it as a hairbrush on self or other).

10. *Sequence Pretend*—repetition of a single pretense act with minor variation (e.g., drink from bottle, give doll a drink; pour into cup, pour into plate) or linking together different pretense schemes (e.g., stir in cup, then drink; put doll in cradle, then kiss goodnight).
11. *Sequence Pretend Substitution*—same as *Sequence Pretend* except using an object substitution within a sequence (e.g., put doll in cradle, cover with green felt piece as “blanket”; feed self with spoon, then with stick).
12. *Double Substitution*—pretense play in which two materials are transformed, within a single act, into something they are not in reality (e.g., treat peg as doll and a piece of green felt as a blanket, and cover peg with felt and say “night-night”; treat stick as person and seashell as cup, and give stick a drink).

One of Belsky and Most’s most important findings is the twelve levels of this play scale actually form a true developmental scale (see their Table 2). They found that if a child displayed a behavior at one level (e.g., *Level 7—Pretend Self*), then that child was highly likely to have displayed all of the behaviors at lower levels on the scale (e.g., levels 1–6). The validity of any *developmental* scale depends crucially on evidence of this sort, which implies that children progress through the scale step-by-step as their development proceeds on whatever construct is being measured by the scale (in this case, infant play).

Belsky and Most also found reason to collapse the twelve levels into three broad categories, as follows:

1. *Undifferentiated Exploration* (Levels 1 & 2)
2. *Transitional Play* (Levels 3–6)
3. *Decontextualized Pretense Play* (Levels 7–12)

Belsky & Most used this categorization to describe the development of infant play in terms of infant age (see their Figure 1):

1. *Undifferentiated Exploration* was the most common form of “play” between 7 and 12 months, but decreased steadily in frequency from 7 months onward.

2. *Transitional Play* was present at 7 months, peaked in frequency at about 13 months, and was the least common form of play by 21 months.
3. *Pretense Play* was almost nonexistent between 7 and 12 months, but increased steadily during the second year, and was the most common form of play by 21 months of age.

If you choose to participate in this activity, you will be trained on this scale during one class period, and then will independently score several infants during a second class period. You will then get together with a partner (after you have finished scoring), compute reliability, and jointly write up the lab activity. You should turn in the write-up within one week of having scored the tapes. The particulars of the lab activities are described in the remainder of this handout.

Requirements

Steps

1. Attend lecture and do the associated readings (see below).
2. Select a partner, and together attend the training session and the scoring session. When scoring the videotapes, just mark the first occurrence of each level of free play (you can make notes to briefly describe the play episode). We will provide scoresheets; a sample is included below.
3. Get together with your partner to compute a reliability (see the handout on *Observational Methods*), and plan your written report.
4. Write your report, following the instructions provided here, and turn it in within one week of scoring the videotapes.

Notes

- Do this activity with a partner.
- Your written report should include (a) both yours and your partner's scoresheets, (b) computation of a single reliability (percent agreement on the highest level of play), (c) a *joint* set of answers to the questions (see below).

- Your grade will be based on your completion of the scoring assignment, and the quality of your answers to the questions. Your grade will *not* be based on the level of agreement that you and your partner achieve, as reflected in your computed reliability.

Materials

- This handout.
- The Belsky and Most article.
- Score sheets (provided by us).

Questions

1. What type of observational method is the Belsky and Most free play scale? What are its strengths and weaknesses? What are the potential sources of bias? (See the handout, *Observational Methods*)
2. Did the free play scale exhibit the properties of a true scale for the children you scored? Why or why not?
3. For each of the children you scored, identify the most likely substage of Piaget's sensorimotor period (e.g., substage 4). Briefly justify your answer for each child.
4. Did you see any evidence of circular reactions? If so, what type were they? Give examples, and briefly describe.
5. Did you see any evidence of representation? If so, give examples and briefly describe.

References

- Belsky, J. & Most, R. K. (1981). From exploration to play: A cross-sectional study of infant free play behavior. *Developmental Psychology, 17*, 630–639.
- Flavell, J. (1963). *The developmental psychology of Jean Piaget*. New York: Van Nostrand.
- Piaget, J. (1952). *The origins of intelligence in children*. New York: International Universities Press.

Infant Play Scale

Subject: _____ Date: _____ Scorer: _____

Free Play Level	FP I (10 min)	FP I (10 min)
<i>Mouthing</i> (indiscriminant mouthing of toys)		
<i>Simple Manipulation</i> (visually-guided manipulation for > 5 sec)		
<i>Functional</i> (appropriate manipulation of toy; extraction of unique information)		
<i>Relational</i> (integrating > 1 toy in an <i>inappropriate</i> manner)		
<i>Functional-Relational</i> (integrating > 1 toy in an <i>appropriate</i> manner)		
<i>Enactive Naming</i> (approximate pretense activity without confirming evidence)		
<i>Pretend Self</i> (definite pretense behavior directed toward self)		
<i>Pretend Other</i> (definite pretense behavior directed away from self)		
<i>Substitution</i> (use “meaningless” object in creative way)		
<i>Sequence Pretend</i> (repetition with variation or > pretend scheme)		
<i>Sequence Pretend Substitution</i> (same as above except with substitution)		
<i>Double Substitution</i> (pretense play in which > 1 object is “transformed”)		