

VTS: Visual Thinking Strategies™

A Brief Guide to Developmental Theory and Aesthetic Development

By Karin DeSantis and Abigail Housen

Note: This guide was originally written in 1996 for psychologists working in our Eastern European program who requested information on developmental theory.

In the arts as well as elsewhere in education, the best teacher is not the one who deals out all he knows or who withholds all he could give, but the one who, with the wisdom of a good gardener, watches, judges, and helps out when help is needed.

-Rudolf Arnheim

Five-year-old John is building a sandcastle. He has a pile of pebbles that he is using as flags on the castle. His teacher walks over and admires his castle. She then takes a handful of pebbles and lays out two similar rows of six pebbles each. She asks John if there is the same number of pebbles in each row. John looks at them closely and replies "yes." The teacher asks him to count the pebbles, just to be sure. John counts them correctly out loud. While leaving one row as is, she spreads the other out, leaving bigger spaces between the six pebbles, and asks John if they still have the same number of pebbles in them. John points to the longer row and says, "No, this one has more."

A year later John is playing with some marbles. The teacher repeats the task. When she lengthens one row and asks John if the two have the same number, he replies, "Yes, of course."

Researchers who study thinking, or *cognition*, use observations of behavior like this to note the ways a child's thinking changes over time—how John's deductive capacities changed during the year he went from age five to six. Even before the acquisition of language, one can infer and describe the kind of thinking an infant brings to her interactions with the environment by observing behavior. For example, if we watch a baby play with a rattle, we see her gradually come to the realization that certain movements elicit sounds. From this, we can infer that the infant has, through trial and error, realized that she can control the noisemaker. When she then picks up one toy after another and shakes it, we can infer that she is attempting to apply her new knowledge about rattles to other objects. Through both behavior and language, researchers have a window into the range of ways people learn from interacting with their environments.

Studying how people think—cognitive psychology—is a relatively new science, and the study of how thinking changes over time—developmental cognitive psychology—is even

more recent. Influenced greatly by James Mark Baldwin (1861-1934) and Jean Piaget (1896-1980), the formulation of “cognitive developmental theory” relies on empirically-derived data--observation of behaviors in the subject’s environment as well as documentation of thinking through language use.

Some Tenets of Developmental Theory

According to developmental theory, learning occurs when individuals interact with their environments (which include people and how they behave, objects and phenomena encountered in the world) and then reflect on that interaction. The learner actively constructs understanding from processing her/his experience, making meaning of every new opportunity or bit of information. In other words, for learning to occur, an individual does something, experiences and thinks about the results of the action (including verbal “actions”), and decides what these results mean to her/him—whether it is a child eliciting sounds from a rattle, a teenager learning to drive, or an adult trying to master a foreign language.

The desire to learn usually results from some kind of dissonance—when individuals see something that they do not understand or cannot do, or when a strategy on which they rely does not achieve the desired goal. For example:

Three-year-old Nancy wants her mother's attention. She runs up to her mother, who is reading on the sofa, and jumps in her lap. Mommy responds by saying, "Don't be so rough." A while later, Nancy again wants attention. This time, she climbs up on the sofa, cuddles up to her mother, and gives her a big hug and kiss. Her mother responds with a hug, and says, "I love you, too, honey."

In Nancy's pre-school a week later, Nancy wants to get her teacher's attention. She goes up to her teacher and gives her a big hug and kiss. Her teacher pushes her away gently and says, "Nancy, if you want my attention you should just ask. You can't go around running up to everybody and kissing them."

The Role of the Environment in Development

Human cognitive development is highly dependent on the environment to which an

individual is exposed. As a child grows, and as her/his interactions with the environment expand and diversify, s/he receives stimulation for further development of meaning-making strategies by encountering new problems that call for finding new solutions.

The process by which Nancy learns is experience. She learned that attention-getting Strategy A (running up to Mommy and jumping on her lap) was less successful than Strategy B (giving her a hug and kiss). Nancy is likely, therefore, to abandon Strategy A in favor of B, in order to get what she wants. From the instance in school, however, she learned that Strategy B is not necessarily the way to get everyone's attention. She is learning from her attention-getting attempts that she must use different strategies to be successful in a range of situations.

Many of the concepts used below to describe developmental cognitive processes are associated with Piaget. Nancy's taking in information, and then learning to apply it, is referred to as *assimilation*. The adjustments she makes to her pre-existing repertory of strategies are called *accommodation*. The construction of understanding is always an active, organized process of

- assimilating information from new experiences into existing ways of thinking, or *cognitive strategies* ; and of
- accommodating, or changing, existing strategies as a result of new perceptions.

As indicated above, development is motivated by the need to resolve conflicts between the information from new experiences, and existing ways of thinking. This can be referred to as maintaining cognitive balance, or equilibrium, and the general process of development is called *equilibration*.

The dynamics of this basic mechanism do not change: they operate in the same way from infancy through adulthood.

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The speed of a child's development varies widely, given different environments. Developmentally-appropriate stimulation and exposure can support and even accelerate development. For example, giving a child who has outgrown a tricycle a two-wheeler with training wheels can accelerate the speed with which s/he learns to balance and pedal the more difficult vehicle while minimizing the possibility of failure and harm.

The opposite is also true: the absence of stimulation can slow down or weaken the developmental process—so, for example, not talking to a child— naming the foods s/he eats, colors s/he wears, things s/he encounters, and describing actions, feelings, and so forth—may result in late and/or inadequate language development.

Developmental Stages: Piaget, Greatly Simplified

Using empirical data, developmental theorists have tended to arrive at the conclusion that cognitive development is a process occurring in a progression of phases, or *stages*. The developmental model argues that:

- the development of thought proceeds in a predictable, measurable order, and in a sequence of stages;
- each stage is equally important;
- each has its own characteristics—particular ways of bringing knowledge to a situation and of learning from that situation;
- each adds new dimensions of thought;
- each is fairly constant across different domains: at any given moment, an individual will typically operate within her/his stage regardless of task or activity. For example, a young child who uses blocks to calculate $2 + 2$ will not normally be able to answer the question “If your brother is 6 and you are 4 how many years older is he?” A viewer who looks for stories in one work of art will apply the same strategy no matter what s/he is looking at. And
- stages are contiguous, with individuals moving from one stage to another and not skipping any.

One of the most important developmental theorists was the Swiss psychologist Jean Piaget, whom we introduced at the opening of this guide. Piaget began intensive studies of

children's reasoning processes in the 1920s. His interest in principles of behavior grew out of his early zoological studies of the behavior of simple organisms. These studies led to his explorations of the nature of intelligence, pursued while working on standardizing intelligence tests for children in Alfred Binet's Parisian laboratory. Many of Piaget's ideas about infant and child development derived from observations of his own children conducted by his wife Valentine and himself, and were developed in collaboration with many scientists and students at the University of Geneva. Piaget described four main stages in the cognitive development of the child:

- **the *sensori-motor stage*** (approximately 0-2 years), during which the infant can understand only in terms of what can be perceived through senses (sensory) and movement (motor), and how its senses and movements relate to each other. The child learns through acting on things (for example, shaking a rattle and learning that it makes sound) and through repetitive attempts to control that experience (repeatedly shaking a rattle to generate the same sound).
- **the *pre-operational stage*** (2-7 years), during which the child can use symbols (words, marks on paper, role-playing) instead of simply relying on sensori-motor exploration. The child develops the capacity for representation and can use words—the symbolic system of language—that stand for actions and things without their immediate physical presence. This becomes apparent, for example, when the child engages in imaginative play—pretending that s/he is feeding a doll or taking care of a stuffed animal as if it were alive. Another characteristic of the pre-operational child is his or her continued egocentrism; the child lacks the cognitive flexibility to take someone else's position.
- **the *concrete-operational stage*** (7-12), during which the child develops the capacity to have abstract thought about concrete experiences. This greater coordination of thought is limited to operations performed on objects. For example, the child can think back and recreate a path to remember where s/he left his/her drum set—instead of going into every room to look for it as would the pre-operational child.
- **the *formal operational stage*** (12+), during which the adolescent moves into the logic of the hypothetical (for examples, forecasting the implications of a certain event) the kind of thinking of which a function adult remains capable. Using the knowledge that the sound of a drum is distorted underwater, the adolescent can speculate about the distortion of sound in another environment. At this stage the learner can think about ideas as well as concrete things. S/he can hypothesize that since certain music forms, whether rock and roll, punk or rap, were considered by some to be subversive and dangerous when first introduced, any new music form may encounter a similar reaction. At this stage the adolescent is capable of seeing things from another's point of view.

Given a supportive environment, the cognitive strategies of one stage transform into those of the next. However, using a series of tasks that demonstrate qualitative change in a child's intelligence from infancy to late adolescence (such as the example of John and his pebbles described in the beginning of this guide), Piaget and his collaborators repeatedly found that children could only be taught concepts that they were already on the verge of understanding. They noted the relation of learner “readiness” to teaching and learning. A child cannot learn the cognitive concepts of a later stage until ready. At each new stage the cognitive strategies of the previous stage/s are integrated.

Another Developmental Theorist: Lev Vygotsky

Piaget's theory is useful in conceptualizing how children come to think as they do, but provides a limited explanation of how cultural and contextual differences influence the process. The research of Lev Vygotsky is better known for exploring these differences.

Both Piaget and Vygotsky emphasized the importance of the child's interaction with the external world in the construction of meaning. While Piaget largely focused on the intellectual growth of the individual, Vygotsky put more emphasis on the contribution of other people in the child's environment to that growth. Vygotsky was a Russian trained in linguistics and law who, like Piaget, became interested in psychology without having any formal training, operating frequently on instinct. While Piaget lived a very long life, Vygotsky (born the same year: 1896,) lived only to age 37 (dying in 1934 of tuberculosis) with many of his ideas yet untested. His short work life, circumscribed to some extent by the changing politics of his country, produced more starts than finishes; his clear writing, his remarkable ability to synthesize and deduce much from the work of others, and his own creative mind resulted in a body of thought that has stimulated lifetimes of research by others.

In Vygotsky's theory, all meaning-making begins with the child's interaction with the primary people in his/her life, most frequently parents and teachers, whom Vygotsky called the carriers of a culture's symbolic systems. Learning requires, he said, that the learner engage with these people in *facilitated interactions*; such interactions or social processes are first observed, then taken in—but not necessarily fully understood or accepted. Eventually these processes are absorbed to the degree that they become useful parts of the

strategies by which one lives. For example, a child hears certain words used in a particular interaction, and begins to recognize them and associate them with that interaction. When s/he actually uses them, and finds that they accomplish the intended purpose, they are really learned. Vygotsky called these learned social elements *psychological tools*. Here is an example:

Stephanie is building a tower with blocks when Michael appears and knocks it over. Stephanie's first impulse is to pick up a block and throw it at Michael. She then remembers what her parents and teachers have told her many times: "It's not good to hit someone who makes you mad. Use words instead." Stephanie puts down the block, puts her hands on her hips and says to Michael: "You know it's not OK to knock over someone else's blocks. It's not fair."

Instead of throwing the block, or appealing to an adult, Stephanie turned to her own resources to problem-solve. She was able to recall speech she had heard in other similar interactions, and tried it out to address the problem at hand.

Through encountering and then trying certain behaviors, one gradually develops scripts or menus to guide social interactions. The learning begins in the social realm ("interpersonal") and through words and verbalizing it eventually becomes internalized or "intrapersonal." This process leads finally to learning that is no longer wholly dependent on interactions, but also requires that the individual be able to reflect on a range of her/his existing "menus" or cognitive strategies.

As they tried to understand the ways in which language is an essential tool in thinking and understanding, Vygotsky and his colleagues noted a phenomenon which they then began to study: children routinely talking themselves through the process of solving a problem that is new to them. This, among other observed behaviors, led to another tenet of Vygotsky—his belief in the importance of words. Spoken language is one of the first sets of symbols (or "signs," which stand for something or some action) learned by an individual and, according to Vygotsky, it is through words that thoughts are formed. Words are essential for thinking, and for later learning in general. Another example of the importance of language is when a child is unable to

physically solve a problem, but is able to verbally describe a solution they cannot perform by themselves. Later in a child's development, a significant change in a child's capacity to use language occurs when the child can turn language inward and appeal to themselves instead of appealing to an adult (as in the example of Stephanie).

A third concept of Vygotsky's is that learning typically occurs when a problem (whether new data, or an unfamiliar object, or a previously-unsolved task) is both within the range of an individual's existing capabilities (a view that concurs with Piaget's findings) *and* involves the support or assistance of an adult or more capable peer (an argument that has tremendous implications for education). He studied how children can independently solve a problem at one level of difficulty, but given a challenge for which they lack the resources personally, they can figure it out with some input from a more knowledgeable helper—as long as the solution is within their developmental range. If it is too difficult, they cannot master it even with assistance. If the problem is repeatedly presented to the child, with decreasing levels of support and increasing demands on the child's resources, the child develops the capacity to move from dependency to self-direction.

Vygotsky called the distance between a child's actual developmental level (as exhibited through independent problem-solving) and the child's potential developmental level (as exhibited through problem-solving with a helper) the *zone of proximal development*.

Aesthetic Development: Housen's Model

Developmental stage theory provides a framework to explain the way a person constructs an understanding in many areas, such as science, language, ethics, or, as we shall now discuss, aesthetics.

Abigail Housen began in the mid-1970s to try to understand how varying degrees of exposure to viewing works of art affected people's viewing experiences. Her search for understanding of what she came to call aesthetic development was based on the same empirical approach that had guided both Piaget and Vygotsky—she looked for patterns and order in behaviors she could observe in the world, and allowed any interpretations to emerge from her observations. Housen used unobtrusive measures that left the subject free to behave entirely naturally. Unlike many theorists in arts education, she did not begin with

a hypothesis that she then tried to prove. This firm grounding in empirical evidence and in unobtrusive measures continues to set Housen's theory apart from other prevalent theories on learning in the arts.

Housen's search for understanding began by observing the movements of viewers in a museum gallery. She noticed that some moved quickly from work to work, and others stopped selectively in front of fewer works and looked at each one at length. Some viewers read all the labels on the wall; others read none. And so forth. From watching many people in different museums, she gradually saw that there were discernible patterns, and groups of people who generally conformed to each. However, these patterns represented only outward behavior, and Housen realized that what she really wanted to know was what was going on inside the heads of these different sorts of viewers—their patterns of thought as they encountered a work of art. For this she needed to develop a unique method of study.

Aware of Vygotsky's convincing arguments about the inseparable relationship between thinking and language, she spent most of the 1970s and 1980s developing a reliable method of studying people's aesthetic thought through their speech. She wanted a method that allowed her subjects to speak freely, candidly, naturally and without influence from her presence. During that time, she listened to people of all backgrounds and ages as they looked at and talked about works of art. At the same time, she was evaluating programs that fostered aesthetic growth, searching for all of the dimensions that nurture it. She tested her hypothesis against the work of other scholars who were interested in this same phenomenon—cognitive scientists, philosophers, and other kinds of theorists.

Housen's Method

The core of Housen's data collection is a non-directive, stream-of-consciousness interview, called the aesthetic development interview (ADI), which has proven reliable in a wide range of studies since 1980. The interviewee is given an image and asked to talk about what he or she is looking at. No directive questions are asked, thus insuring that the interviewer does not influence the interview. The subject is simply invited to talk as if s/he were thinking out loud, talking about what is seen.

The interviews are taped, and then transcribed. Trained coders then “parse” the interviews, breaking them into thought units; a thought unit is the smallest linkage of words

that has meaning and can stand on its own. A numerically-calculated selection of fifteen isolated thoughts is categorized. This is done using classifications in a manual developed by a long process of studying the variety of thoughts that people have spoken during their interviews. The fifteen thought units are assigned numbers, graphed, and a statistical profile of the individual is generated using a method developed by Jane Loevinger. A temporary aesthetic stage is assigned in this process, and this scoring is then compared to a clinical analysis, arrived at by reading of the entire interview. Only when these two stage scores—derived by two very different means of study of the same material—conform is a final aesthetic stage assigned to the interview. The aesthetic development stage score is used as a framework for understanding other information gathered through observations, questionnaires, content questions, journals, portfolios of related assignments, and other primary and secondary data.

Housen's Stages of Aesthetic Development

Over the course of the many years that she has intently studied the voices of different viewers, Housen has identified five distinct patterns of thinking that correlate to the amount of exposure subjects have had to art. These five patterns are described as the following aesthetic stages:

Stage I — Accountive viewers are storytellers. Using their senses, memories, and personal associations, they make concrete observations about the work of art which get woven into a narrative. Here, judgments are based on what is known and what is liked. Emotions color their comments, as viewers seem to enter the work of art and become part of the unfolding narrative.

Stage II — Constructive viewers set about building a framework for looking at works of art, using the most logical and accessible tools: their own perceptions, their knowledge of the natural world, and the values of their social, moral and conventional world. If the work does not look the way it is “supposed to”—if craft, skill, technique, hard work, utility, and function are not evident, or if the subjects seem inappropriate— then this viewer judges the work to be “weird,” lacking, and of no value. The viewer’s sense of what is realistic is a standard often applied to determine value. As emotions begin to go underground, this viewer begins to distance him or herself from the work of art.

Stage III — Classifying viewers adopt the analytical and critical stance of the art historian. They want to identify the work as to place, school, style, time and provenance. They decode

the work using their library of facts and figures that they are ready and eager to expand. This viewer believes that properly categorized, the work of art's meaning and message can be explained and rationalized.

Stage IV— Interpretive viewers seek a personal encounter with a work of art. Exploring the canvas, letting the meaning of the work slowly unfold, they appreciate the subtleties of line and shape and color. Now, critical skills are put in the service of feelings and intuitions as these viewers let underlying meanings of the work—what it symbolizes—emerge. Each new encounter with a work of art presents a chance for new comparisons, insights, and experiences. Knowing that the work of art's identity and value are subject to reinterpretation, these viewers see their own processes subject to chance and change.

Stage V — Re-creative viewers, having established a long history of viewing and reflecting about works of art, now “willingly suspend disbelief.” A familiar painting is like an old friend who is known intimately, yet full of surprise, deserving attention on a daily level but also existing on an elevated plane. As in all important friendships, time is a key ingredient, allowing Stage 5 viewers to know the ecology of a work—its time, its history, its questions, its travels, its intricacies. Drawing on his/her own history with one work in particular, and with viewing in general, this viewer combines personal contemplation with views that broadly encompass universal concerns. Here, memory infuses the landscape of the painting, intricately combining the personal and the universal.

Significant to understanding aesthetic development is that while growth is related to age, it is not determined by it; in other words, a person of any age with no experience with art will be in Stage I. An adult will not be at a higher stage than a child simply by virtue of age. Exposure to art over time is the only way to develop, and without both art and time, aesthetic development doesn't occur.

As with all stage theorists, Housen is clear that all of the above stages are equally important. Though they occur in sequence, no stage is "better" than another. Intelligence and creative thought are exercised at each stage. Stages are “modes of operation” or of problem-solving strategies. It is important to note that aesthetic stage is fundamentally characterized by ways of thinking about aesthetic objects. Each thoughtful encounter with a work of art adds to a viewer's strategies for making meaning of subsequently encountered aesthetic objects. Like all developmental change, movement through aesthetic stages must occur naturally. A teacher must offer strategies fitting to the stage of the viewer: developmentally inappropriate concepts will not "stick." This is confusing, because students can be “taught” stage-inappropriate information, for example, and it can be memorized and

retained for the short-term, and perhaps recalled with prompting. But what Housen's studies have shown is that teaching anything but what the students are on the verge of learning or what is within their "zone of proximal development" will not become operational to the student. Just as indicated by Piaget and Vygotsky, behaviors that are not part of a natural arc and are not germane to a student's needs will not show up in unprompted, independent behavior.

The Beginner Viewer

Consistent with developmental theory, Housen's original research and the results of studies conducted using her model, most viewers—and certainly most children—are at Stages I and II. The Stage I viewer makes random observations ("The feet", "The leg") that are concrete and obvious. This viewer also relies on personal, idiosyncratic observations that are unlikely to be made by anyone else ("Maybe it's an orangutang"). The Stage I viewer's style is generally characterized by an egocentric perspective. Judgments of images and objects are based on whether or not the work lives up to personal associations and standards. If the viewer likes sailboats and the painting is of a sailboat, then it is a good painting.

The Stage II viewer is engaged in building a framework for looking at objects by relying on readily available information. This information is not art historical in content, but consists largely of the standards of the "real world." In addition to a wide range of general descriptions ("Then she is tiptoeing"), the Stage II viewer relies on descriptions which are based either on the viewer's concept of "reality" informed by personal criteria ("Looks pretty weird") or by the viewer's concept of "reality" informed by photographic or idealized criteria ("It doesn't really look like a head"). A significant finding of Housen's research is that the majority of adult museum-goers fit within these two stages. They might thus be called beginner viewers, something which most museum educators have noted. This finding calls into question the usefulness of the traditional art historical presentation of information in museums, a practice more suited to the needs of intermediate viewers. The interests and needs of beginner viewers, both children and adults, would be better served by

developmentally-appropriate encounters with works of art, such as the Visual Thinking Strategies developed by Housen, Philip Yenawine, and their colleagues. As with all developmental theories, Housen's stage descriptions provide "footprints along a pathway" of aesthetic growth which illustrate the parameters and guidelines for informing and transforming art educational practice.

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