

**Views of Life on Earth:  
Children's Narratives and Contexts of Meaning**

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## Abstract

The present study explores the complexity of children's understandings of the world. Drawing on data from several studies, children's notions about the world are used to elaborate the complex interrelationships within the theoretical framework of "contexts of meaning" (Bloom, 1990; 1992a; 1992b; 1992, May; in press). Contexts in this sense are cognitive, as well as sociocultural. What is meaningful to a child involves a framework of complex sets of relations among semantic knowledge, personal experiences, metaphors, interpretive frameworks, and emotions-values-aesthetics. The present paper explores the idea that many perspectives can be incorporated into how children understand and create meaning through narrative processes.

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When we think of teaching science in the elementary grades, particularly from a constructivist point of view, we are concerned with the specific concepts related to the topic to be investigated in class. The focus of the activities is on involving children in the exploration of their own concepts in relation to the scientific versions of these concepts. However, what we do not consider is a wider sense of the meaning they bring with them into the activities. In an earlier study of young children's (grades 1-3) understandings of earthworms, the results showed a surprisingly strong influence of a variety of factors beyond that of the expected semantic or formal knowledge. These factors included (a) personal experiences; (b) metaphors; (c) interpretive frameworks, such as, anthropomorphism, anthropocentrism, and zoomorphism; and (d) emotions-values-aesthetics. More recently, other factors have been added, such as (a) imagery and (b) narratives and elaboration. The interplay of these factors, including semantic knowledge, results in rich and personally meaningful understandings, which have been referred to as "contexts of meaning" (Bloom, in press; 1992a; 1992b; 1990).

Although dynamic in nature, contexts of meaning are more or less coherent arrays of information imbedded in emotions, values, and so forth. For example, the phrase, "that worm is wagging its tail," can refer to a context of meaning around tails (Bloom, 1990). Such a context can contain (a) all sorts of emotions, values, and aesthetics; (b) an assortment of information about tails; and (c) ideas influenced by anthropomorphic and zoomorphic interpretive frameworks. At the same time, overlapping contexts can come into play, such as those concerned with dogs' tails, tails of kites, a dragon's tail, and so forth. In other words, contexts of meaning may encompass many different possible perspectives. From this point of view, meaning is seen as a complex association of multiple perspectives or understandings. Gregory Bateson and Jerome Bruner have suggested a similar notion of a wider framework for looking at what is meaningful. Both Bruner (1986) and Bateson (1972) include the notion of multiple perspectives as a dimension of human knowing and interaction.

The notion of context suggests patterns and interactions among multiple perspectives, all of which occur within a framework of story or narrative. Bateson (1979)

refers to context as a story or pattern of connectedness. Bruner (1990) contends that narrative, through "...its sequentiality, its factual 'indifference,' and its unique way of managing departures from the canonical..." (p. 50), can organize information in ways that are not categorical or hierarchical. Both the real and the imaginary can be attended to without any loss of strength to the story. Bruner also describes the basic requisites for narrative as (a) having sequence or organization; (b) having voice or perspective; (c) marking the unusual; and (d) involving interaction among various elements, such as, agent, action, object, and so forth.

Further research into contexts of meaning has been pointing to the strength of narratives or stories as a means of making sense of the world (Bloom, 1992; 1992, May). Such narratives provide for elaborate and extensive understandings that can include scientifically accurate knowledge, as well as intriguing fiction. Both of these understandings (scientific and nonscientific) are significant and useful, but in different situational contexts. Our tendency has been to dismiss the nonscientific, even to the point of trying to replace it. Because of the nature of narrative understanding, as opposed to the more structural view of conceptual understanding (which is categorical in form [Kiel, 1989; Lakoff, 1987; Macnamara, 1983; Markman, 1989]), our understanding of learning and conceptual change needs to be modified (Bloom, 1992, April; 1992, May). Such a change in how we approach learning in science can include not only scientific knowledge, but also integrated, multiple understandings that can enrich children's creative writing and artistic expression, as well as their understandings in various disciplines, such as social studies, history, and mathematics.

This paper will examine children's ideas about the nature of life on Earth as contextual narratives or stories that incorporate a wide range of semantic knowledge, personal experiences, interpretive frameworks, metaphors, and emotions-values-aesthetics. Children's responses on tasks will be explored as potential context markers or pointers to wider understandings and to further stories or narratives.

## **Method**

The data presented in this paper come from several studies in one classroom over a period of about four months. The subjects included 24 children in a grade 5 class. The school was located in a middle to upper middle class neighborhood of a small city in eastern Ontario. For the most part, the children came from professional or highly skilled families. The children's pseudonyms have been arranged according to grade level, so that grade 5 names begin with "E."

During the spring of 1989, all 24 children were asked to complete a variety of tasks designed to elicit their ideas about different aspects of life on Earth. For the purposes of the present paper, one task serves as the focus of the analysis. This task involved giving each student a piece of drawing paper (approximately 14 x 20 inches or 21 x 30 cm.) and asking them to communicate their ideas in response to the following instructions:

Aliens from outer space have just contacted you. They are interested in finding out what life on Earth is all about. They can translate your language, even your misspellings.

Feel free to draw and/or write anything you want. You can use both sides of the piece of paper.

In addition to this primary task, data from other tasks are drawn on from time to time to support specific arguments or to extend the understanding of specific contexts or children. These other tasks included, (a) a context map of "issues facing the world," (b) a context map of "forests," (c) a taped interview during a hike in a marsh and field, and (d) a taped interview of an examination of earthworms. When necessary, follow-up interviews were used to probe into specific students' ideas in their "life on Earth" tasks and context maps.

Further information on context maps can be found in a recent paper by Bloom (in press). In short, however, context maps are brainstorming exercises which are constructed by connecting the generated terms or phrases (usually descriptions and examples) to the stimulus word or phrase (topic) which is located at the center of the page. The subjects are then instructed to connect any relationships they see between these terms or phrases by lines and label them appropriately. The resulting map has the terms or various perspectives arranged in a circular fashion around the topic word with labeled relations occurring between the perspectives (see Figures 2 and 6, for examples).

## Results

Children's understandings of their world take on the characteristics of narrative, even when expressed exclusively with pictures. We will see varying degrees of organization or sequence, of perspective, and of interaction among elements (agents, actions, objects, etc.). In addition, we will see how they tap into the unusual or exceptional. Children's stories can bring in elements of or focus upon "real," formal knowledge information and topics. At the same time, they can delve into fantasy and even intermingle the two.

Fantasy is a significant part of two students' responses on the "what's life on Earth about" task. Both boys created stories about being contacted by aliens (which is appropriate considering the instructions to the task told students that aliens had contacted them and wanted to know what life on Earth is all about). Elvin's drawing shows a boy talking on a walkie-talkie accompanied by the following commentary: "I was standind [sic] on my front lawn and I was playing on my walky-talky [sic] and an alien came on and stared [sic] talking Japanese [sic]." The next picture shows what is presumably an alien. In a follow-up interview he commented that,

*our teacher [a student teacher] came and she told us we were supposed to make [these creatures out of waste materials], so we made ours as a group out of a cereal box and an old toothbrush and a spring water bottle. This guy's talking on a walkie-talkie to his friend. An alien gets on and starts talking. He doesn't quite understand, but he starts speaking Japanese.*

Elton's drawing is similar to Elvin's in that both aliens are constructed out of the

same materials: a spring water bottle on their heads and "super G" on their chests. Presumably both boys worked in the same group. However, Elton's commentary included with his drawing is a bit different: "Me and Gizmo he contacted me on TV. I was happy! He still had his water pistle [sic] and tomato blaster. I was happy to see him." These two stories contain Bruner's basic requisites of narratives, namely, sequence (organization), voice or perspective, interaction, and marking the unusual.

Although the previous stories do not address the purpose of the task, they are expressions of what happened to be important to these two boys at the time. Such expressions of personal importance relate to emotions-values-aesthetics and personal experiences. Similar, digressions from the intended purpose of the researcher occurred with the context maps of "issues facing the world" by two girls. Evelyn's context map centered around the topic "summer," which included, (a) swimming, (b) shorts, (c) pools, (d) swimsuits, (e) flip-flops, and (f) bicycles. When asked about this she said that she likes it when the weather is warm. When asked again about issues facing the world, the only thing she mentioned was pollution. In a similar way, Elizabeth focused her context map on musicals, because she "loves acting." However, on the forest context map, Elizabeth included several topical issues, such as, extinction, killing of rain forests, acid rain, endangered species, and invaders ("hunters" in the forest and "cities" encroaching on forests).

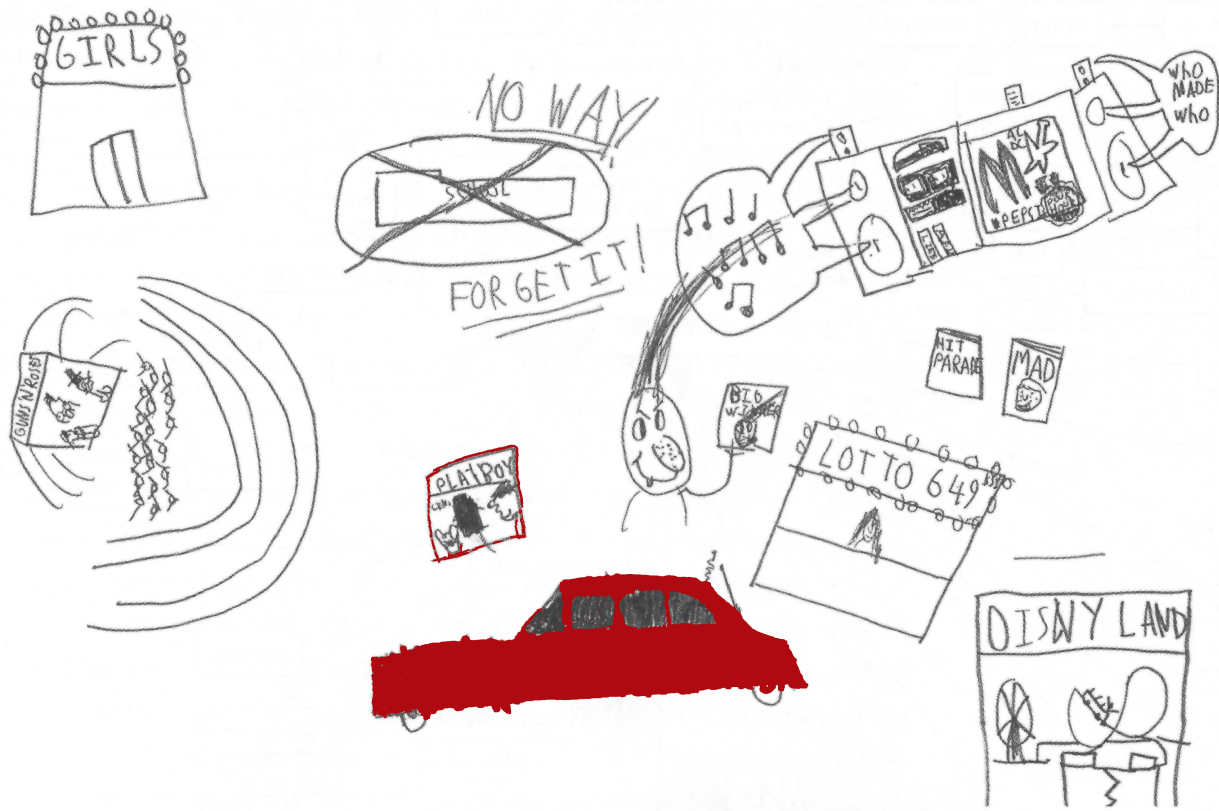
Everett's response to the "life on Earth" task was written and illustrated as a "real" story in poetic form:

*On earth we have four different seasons winter, spring, summer, fall.  
In winter it is cold because of snow it's like frezzing [sic] rain but you can build  
snowforts [sic].  
Spring is the season where the crazy weather starts. Rain--sun. But it's a nice change  
from winter.  
Summer is the season that's the hottest the sun is brighter and it barley [sic] ever  
rains.  
Fall is the season where all the leafs [sic] fall of [sic] the trees.  
We have creaturs [sic] called animals, dogs, cats, mice, birds, fish.  
We are called humans we live in homes and transport by cars.  
This is a home we like sleep & eat in here.  
This is a car we transport by this.*

His story takes on a thematic approach with seasons as the primary topic. The theme serves as a way of organizing and sequencing his thoughts. In terms of contexts of meaning, his story contains elements of emotions-values-aesthetics, personal experiences, and semantic knowledge.

In Figure 1, Evan's depiction of life on Earth is substantively very different from the other students' tasks. Although he depicts a school and a car, both of these items are heavily embedded within emotions-values-aesthetics. The school is crossed out and surrounded by "NO WAY! FORGET IT!" While drawing the bright red car, Evan kept

repeating, "A Jaguar! This is what life's all about!" Even though his drawings are unique within his class, each one reflects sociocultural contexts, as well.



**Figure 1.** Evan's representations of "life on Earth."

Evan is a very bright, but underachieving child, he has trouble fitting into the normal setting. Although he is not disruptive, he spends much of his time with his own interests and stories (he said that he wants to be writer). For example, at one point during a marsh walk (which was tape recorded) after we had talked about various plants and animals we had seen along the way, he said,

now, the path is getting narrower. You can just... slightly see the path. It's like a "Choose Your Own Adventure" story. We have to decide which path we're going to go through.... There's a new James Bond "Choose Your Own Adventure," but who cares about that. Let's just get back to where we were, reality. The thing I hate the most is reality. I'd rather sleep all my life...

During an earlier interview during which we talked about earthworms, Evan began by saying,

*which way is your head? I think this one. What does it feel like to be a worm under the ground all the time? You just, you just have these little testicles and they pick up stuff. (sighs) It must be dark or something like that.... Great for fishing.... I don't know.... I just think it would be dark. It would be a bit boring. I think it would be*

*lonely.... [Interviewer: Lonely?] Lonely.... I don't know. It just feels weird to be a human being.... I don't know. It depends.... There are some times when I just get really, really confused. But how come everything, every subject in my life has to do with a Led Zeppelin song. I just realized, but that has absolutely nothing to do with it.*

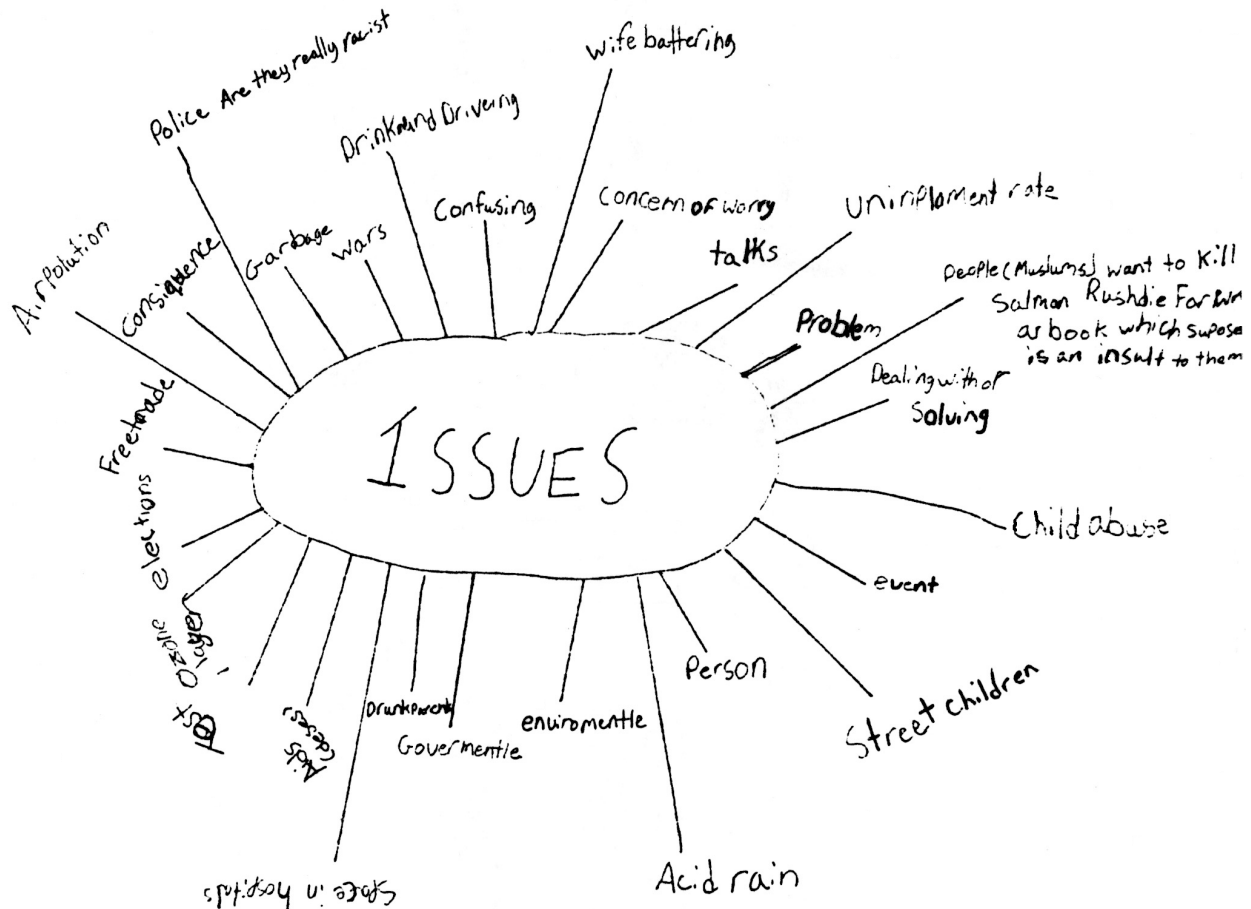
Before returning to his observations of the worms, Evan goes on to describe how he feels different. With such a view of Evan in mind, the items depicted in Figure 1 can be interpreted somewhat differently. School routines do not stimulate his interests or meet his needs. In a way, many of the items are metaphors of difference, of being different. His connections to and questions about phenomena are personal. Anthropomorphism and emotions-values-aesthetics guide much of his thinking and construction of meaningful "stories."

Other stories are less elaborate. Emily's three images of life on Earth are (a) "going to work," (b) "growing up" (with a picture of a flying baby, older child, and adult), and (c) "becoming a millionaire [sic]" (with a picture of people riding in a limousine). Such depictions involve the interpretive framework of anthropocentrism. In addition, the last one (becoming a millionaire) shows a goal orientation that combines interpretive frameworks with a certain set of values. The value placed upon money adds to the development of a different type of goal oriented interpretive framework. The problem is whether to take her responses to this particular task as completely serious. Emily is a bright, aware, and articulate girl with a wry sense of humor. However, even if her responses are a humorous ruse, her portrayal of life on Earth is an interesting social commentary and a valid context of meaning.

Her more serious treatment of the "issues" context map can serve as an example of the type of thinking of which she is capable (Figure 2). Among the 28 aspects of issues facing the world, she includes (a) "police, are they really racist;" (b) "wars;" (c) "confusing;" (d) "uninploment" [sic]; (e) "people (Muslims) want to kill Salmon Rushdie for writing a book which supposedly [sic] is an insult to them;" (f) "Aids;" (g) "elections;" and (h) "consiquence" [sic]. She explains in a follow-up interview that,

*the issues were broken into several levels. At the first level are symptoms of problems, words like "problem," "event." At the second level are words pertaining to consequences of actions, words like "election" and "drinking and driving." The third level is issues, current events. [emphasis added]*

Emily's understanding and organization of her knowledge are quite sophisticated.



**Figure 2.** Emily's context map of "issues facing the world."

Another student, Ellis, depicted a simple comparison embedded in emotions-values-aesthetics. On one side of the page is a large building with smoke coming from a stack on the top and a highway, along with the statement, "some places are not so nice." On the other side of the page is a country scene, with the statement, "but then tere [sic] are some places that are nice."

**Context Markers**

As seen in the previous examples, the children's communication has story-like form, including, sequence, perspective, interaction, and usually some aspect of the exceptional. Their expressions of life on Earth also contain context of meaning components, such as, metaphors, interpretive frameworks, personal experiences, emotions-values-aesthetics, as well as elements of formal knowledge. The cohesiveness and flow of these stories along with the context of meaning components combine to produce a fairly rich picture of children's understandings.

However, not all of the children organize all of their ideas in a single, cohesive, story-like form. Some children point to an assortment of ideas. Each idea takes on a



functional role of pointing to potential stories. Such pointers can also be referred to as context markers. Context markers point to larger understandings or particular contexts of meaning. Multiple understandings often can be alluded to by certain words or phrases. Context markers can be symbolic or more concrete. Some context markers are shared among students (sociocultural contexts of meaning), while others are unique to a specific individual (idiosyncratic or cognitive contexts of meaning).

For example, three students portray "Freddy Kruger," the horror movie character. This character points to a social phenomenon that has become a marker for a socially shared context of meaning. On the other hand, as we have seen previously, one student, Evan, spent a great deal of time drawing a red jaguar (car), while saying, "This is what life's all about! This is what life's all about!" Although other students depicted cars, Evan's car marks a particularly personal context of meaning. Both of these contexts of meaning, "Freddy" and the "jaguar," contain semantic and personal experience elements, as well as elements of emotions-values-aesthetics.

A prime example of symbolic representations that serve as context markers for real stories is Effie's life on Earth task. Effie's description of life on Earth demonstrates the extent to which children's complex and abstract ideas are represented by simpler expressions, as in her series of drawings (see Figure 3). In a follow-up interview, she explains that each drawing represents or symbolizes a greater meaning. For example, she conveys that,

*...cars, ships, planes show how we travel...skeleton of a dinosaur shows prehistoric life...space travel [rocket] shows that we go beyond Earth....pyramids show our history, a school shows that we are educated...books show what we know....a chain of people show that we sometimes live in harmony...a football symbolizes the games that we play...a loaf of bread shows what we eat....a piggy bank shows that we save money, and a Canadian flag tells who we are.*

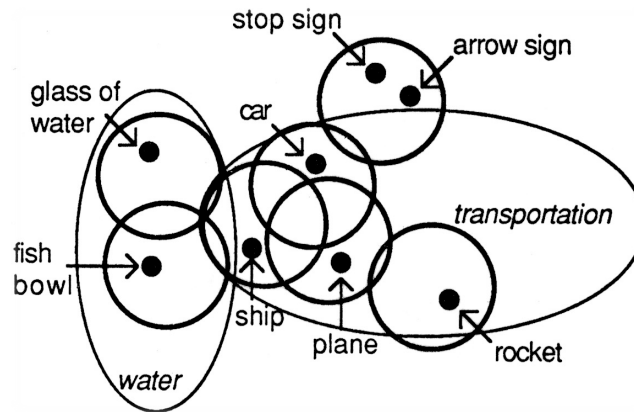
Each of these symbols points to a greater context of understanding. Such a context of understanding or meaning extends beyond what Effie mentions in her interview. For example, she states that school shows we are educated. However, we can assume that she has a great deal of experiential knowledge of school and that she has all sorts of emotional and valuative connections with school. In a way, exploring each symbol in her drawing (Figure 3) is like opening a door to a large arena of personal experiences, semantic knowledge, metaphors, interpretive frameworks, and emotions-values-aesthetics. Each symbolic image tells a story about life on Earth. Much like an amateur anthropologist, she delineates a wide range of features and characteristics of living in Canada.



From left to right and top to bottom: car, dinosaur skeleton, rocket, movie screen and projector, airplane, ship, signs, camera, daily newspaper, pyramids, cat, school, book, shopping bag, hamburger, high-rise apartment building, glass of water, chain of people, football, loaf of bread, fish bowl, piggy bank, and Canadian flag.

**Figure 3.** Effie's symbolic representations on the "What's life on Earth about?" task.

Each of Effie's symbols is a context marker. The contexts to which they allude often overlap. For example, "airplane" and "ship" both refer to modes of transportation. She recognizes this commonality in her interview, however her experiences and knowledge of the airplane context may differ to a large extent from her ship context. An example of two context markers that differ a bit more widely but still overlap is "glass of water" and "fish bowl." Her comment in the interview that a "glass of water" represents water opens up a context quite different from that of "fish bowl" which "...shows an animal that lives in the water." Although both are related to a larger context of water, a glass of water has different associations than a fish bowl. At the same time, the context marked by "ship" overlaps with both senses of water. A simplified diagrammatic representation of the two larger contexts of water and transportation appears in Figure 4. The larger contexts are inferred, but serve to make the point that multiple and overlapping contexts may be imbedded within larger contexts.

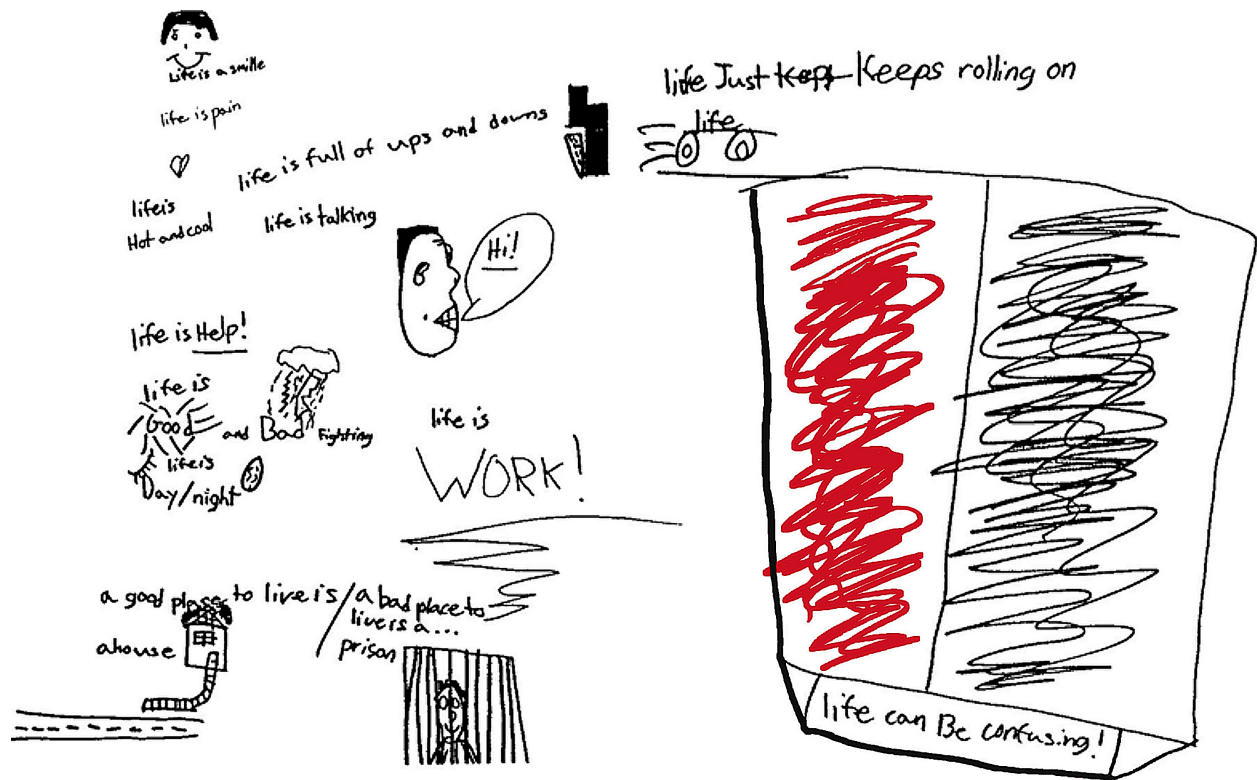


Context markers are indicated by black dots (•).  
Larger inferred contexts are labeled with underlined terms.

**Figure 4.** A diagrammatic representation of Effie's context markers and overlapping contexts in relation to two larger contexts of water and transportation.

The context markers described in Effie's task are actual objects. Many of these context markers are shared among other students. For instance, eight students mention cars, four mention planes, seven mention ships or boats, two mention spaceships, and seven mention water. Examples of other semantic context markers evident in the students' tasks include (the number in parentheses shows how many students used these context markers): drugs (1); house, home, or apartment (10); televisions (7); radios (2); telephones (2); medicine (1); buildings and other large structures (15); prison (1); and pollution (2).

Although many of the contexts marked by semantic characteristics contain other features, such as emotions-values-aesthetics, interpretive frameworks, metaphors, and so forth, such other characteristics can be context markers in themselves. For example, Elliot's responses to "what's life on Earth about?", for the most part, are not closely associated with formal or semantic knowledge (Figure 5). Many of his comments depict opposites, such as, (a) "life is a smile...life is pain," (b) "life is Hot and cool," (c) "life is full of ups and downs," (d) "life is Good and Bad...fighting," (e) "life is Day/night," and (f) "a good place to live is a house/a bad place to live is a...prison." His other comments include, (a) "life is talking," (b) "life is WORK!," (c) "life is Help!," (d) "life Just Keeps rolling on," and (e) "life can Be confusing!" Each statement and image points to a specific and highly personal context of meaning. In addition, his statements tend to be metaphoric with a strong influence of emotions-values-aesthetics and interpretive frameworks. The pictorial imagery included with some of the statements is further evidence of Elliot's metaphoric way of thinking.



**Figure 5.** Elliot's emotions-values-aesthetics and metaphoric representations on the "What's life on Earth about?" task.

Elliot's contextual view of life, as expressed in the "what's life on Earth about" task, is quite different from other students in the class. Although he is obviously quite sensitive and perceptive, among his peers he is very sociable and out-going. His responses to the two context mapping tasks were more typically semantic. However, his context map of "issues facing the world" showed his awareness of a wide range of significant problems. Figure 6 shows Elliot's "issues."



Elaine depicts 12 scenes about life on Earth, some of which are metaphoric. Her scenes are titled (a) "people," (b) "watching shows," (c) "lazy people's homes," (d) "citys" [sic], (e) "alpes" [sic], (f) "farms," (g) "schools," (h) "beaches," (i) "sunset," (j) "wildlife," (k) "robbery's" [sic], and (l) "towns." Her scene of people shows two men standing around smoking cigarettes, one of whom has a big pot-belly. In a follow-up interview, she explains that,

*people are getting into drugs these days. There's a lot of problems about drugs in big cities and that's a problem. I don't think they should do that because it just pollutes the city, pollutes the air and of course it's bad for them. I think everybody should stay healthy and so....I should have put drugs there.*  
*Her pot-bellied smokers represents a larger context of meaning about drug abuse.*

Her drawing of a lazy person's home contains a "Sony" TV, an ash tray with a burning cigarette, some furniture, and other indefinable objects. In her comments later, she says,

*you know, lazy people's homes they're all junky. Well, they smoke and sometimes that can cause problems because if they smoke they can eat too much and then they throw it away and they dirty up the buildings and the rooms and usually sometimes if they smoke they cause fires....*

Although her logic is interesting, she expresses a larger context of meaning that interconnects a variety of issues and concerns with a complex of emotions-values-aesthetics.

In addition, Elaine's unsolicited comments about other features of her task include: Sometimes, with this one [picture of "Jack's Jewelry" store under the label "robbery's" (sic)] I was trying to show them that life's not always good, sometimes it's bad, like robberies....and, um also good things like sunsets are very pretty and Alps with sunsets behind them are pretty and beaches, miles and miles of beaches.

Her view that life is not always good, although simpler, is similar to Elliot's view of life on Earth. Elaine's scenes contain complex metaphoric representations along with more straight forward depictions of life on Earth as she experiences it. Each of her drawings, however, appears to be embedded in emotions, values, and aesthetics.

Ella's representations of life on Earth are typically semantic in nature and include such items as clouds, birds, TV, flower, apple tree, school with a swing, light bulb, box, airplane, and "lady driving a car" (with the car looking very much like a ladybug on wheels). However, her context map of forests contains a number of emotions-values-aesthetics context markers. Along with semantic items, such as plants, wolves, grass, branches, trees, and wood, she also includes, (a) "dark," (b) "nothing," (c) "no store," (d) "scarry" [sic], (e) "dangerous," (f) "no garbage cans," and (g) "no one (alone)." From her follow-up interview and from conversations with her teacher, Ella's background is quite unique. As a political refugee, along with her family, she has lived in many parts of the world. The following excerpts from a follow-up interview should help to explain the

important part that emotions-values-aesthetics play in her constructions of meaning. (Because of the sensitive nature of Ella's situation, actual locations are omitted from interview excerpts).

*I: Have you ever taken a walk in a forest?*

*E: No, not in [here], [on this continent], in this [country].*

*I: and had you walked through forest there...?*

*E: Um hum*

*I: And they're pretty scary?*

*E: Um hum. There are these people who like wear masks and come through the grass and scare you.... Like, sometimes they steal... sometimes they'll catch you and take you to...I don't know... They'll kill you sometimes and steal all your things and run away like...*

*I: Why did you put no stores, nothing, nobody?*

*E: Well, because... there's no one. Like sometimes there is someone there but there's no one... you're alone. And sometimes... there are no stores. If you're hungry, you have to bring your own things.*

*I: Why did you mention dark, scary, and dangerous?*

*E: Because...like, my mom doesn't allow me to walk alone because, like, people are out there who are...even if its a big person they can like come and grab your things from your hand and run away? Like, sometimes they can come behind you, if you're holding your bag behind and take something out of your bag....*

*I: Can you describe the forest? What's your impression?*

*E: There's trees and a lot of grass... like quiet... like, only if you hear a frog or something....*

Although her experiences reveal very emotional contexts, she still has a less threatening image of the "quiet...hear a frog or something." At the same time, these scary images do not dominate her view of the world as can be seen in her responses to the "what's life on Earth about" task.

The stories children tell in their drawings, writings, and conversations do, themselves, tell stories about the children. What is meaningful to each child becomes a meaningful story, or meaningful stories, about that individual and what she or he knows. The nature and substance of these stories and their associated meaning is important for developing our understanding of how children learn and construct meaningful knowledge.

## **Discussion**

In the present study, the open-ended question--"what is life on Earth about?"--provided children with an opportunity to express some of their ideas and feelings about their experiences and knowledge of living in this world. The results obviously do not reveal a complete picture of what they know. However, we do get a glimpse of how they

make sense of the world, how they organize their ideas, and what happened to be meaningful to the children at the time.

Stories appear to be a common and important way of organizing ideas. The students' stories included both reality and fantasy. Some were commentaries on society. Some were personal, while others were real descriptions of our world and its history. They all included some aspects of sociocultural contexts, as well as metaphors, interpretive frameworks, personal experiences, and emotions-values-aesthetics.

The richness of children's thinking apparent in such stories or narratives is not always evident to classroom teachers or researchers. Many of the tasks we use to evaluate thinking and knowledge do not allow children to express and organize their ideas and feelings in a way that is natural and comfortable to them. As a result, we have been missing a significant element of children's thinking. The components of contexts of meaning (emotions-values-aesthetics, metaphors, interpretive frameworks, etc.) are important influences on how children categorize phenomena and make inferences (Bloom, in press). Narratives allow for the bringing together of elements of knowledge and meaning in ways that are not possible through categorical or propositional schemes. Emily's brief narrative of growing up and becoming a millionaire with its social commentary and humor, including a crying baby flying through the air, cannot fit into a simple categorical scheme.

Some stories are more like potentialities pointed to by context markers. Such context markers can be considered as pointers to larger contexts of meaning. As we have seen, different context markers can point to overlapping contexts. Evident within such contexts and in the context markers themselves are the various components of contexts of meaning. The significance of context markers and overlapping contexts of meaning involves how they affect our understanding of learning and knowledge and how they can influence instruction and curriculum development.

If we consider the representation of context markers and overlapping contexts in Figure 4, we really only see a few potentialities in the form of context markers. The contexts of meaning surrounding these context markers are what children bring into the arena of meaning-making. The context of marker, "rocket," was displayed as a typical exemplar of rocket (see Figure 3). The production of this exemplar is not surprising, based on what we know from the research on schema theory (Champagne & Klopfer, 1984). According to this theory, relevant semantic knowledge would be associated in various ways with "rocket." However, from a contexts of meaning perspective, not only is semantic knowledge associated with "rocket," but also personal experiences, metaphors, interpretive frameworks, and emotions-values-aesthetics. Although some aspects of such contexts are shared socially, others are idiosyncratic. A student living in Clear Lake, Texas (near NASA's Johnson Space Center) will have different perspectives than a student in Ottawa. The Clear Lake child may have known one of the astronauts who died aboard the space shuttle, Columbia. The impact of this event would influence the construction of a different context of meaning in the Clear Lake child than in the Ottawa child. However, if the Ottawa student is involved in model rocketry, she or he will have different experiences and emotions-values-aesthetics incorporated into that particular context of



meaning. Learning from a context of meaning point of view is heavily influenced by personal experiences and the other aspects of contexts of meaning.

The potentialities inherent in context markers, however, provide powerful cues for instruction. Even though "rockets" as a context marker may be shared among all of the students of a particular class, the meaning associated with rockets may be different for each child. However, the rocket context marker points to a wide range of possible connections. Some possible examples include, (a) rockets and jet propulsion, (b) jet propulsion and squid, (c) rockets and space exploration, (d) rockets and UFOs, (e) rockets and danger, (f) rockets and missiles, (g) rockets and "star wars," and (h) rockets and fireworks. Rockets also overlap with other contexts associated with planes and other kinds of transportation. Since "rocket" came up in the larger context of "life on Earth," rocket becomes a potential topic for further study. In addition, all of the potential examples of connections with rockets become avenues for instructional development.

The contention of a contexts of meaning approach is that instruction and curriculum development address not only semantic knowledge, but all aspects of meaning, as well. To assume that children are constructing meaningful knowledge when dealing with semantic knowledge alone is not enough, when significant and highly influential aspects of knowing are ignored. As mentioned previously, interpretive frameworks and emotions-values-aesthetics affect how semantic information is processed and organized (Bloom, in press). We need to look at what children have to say in the way that they feel most comfortable. Then we need to help children develop their own particular strategies, as well as develop new ways of working with what they know. If one child, such as Effie, uses a lot of symbols, her approach could be examined and explored by other children. The child, such as Everett, who uses a poetic form for organizing his views, can serve as an example for this approach. The "nice" pictures of some children can be examined in contrast to the more critical depictions of others. The classroom can serve as a forum for sharing ideas and approaches in a way that would encourage a kind of metacognitive reflection.

Such an approach will also encourage children to understand different perspectives. The teacher, as well, should introduce different contextual perspectives. Such perspectives may include scientific views and views from different cultures (such as Native American, various African tribes, etc.). Depending upon the topic, radically different views may even occur within the same culture and can be presented for examination. Such an examination of differing contextual perspectives can lead to what one might think of as contextual flexibility or the ability to understand different perspectives. We can foster children's critical thinking by guiding them through processes that will allow them to make decisions about which particular view or views they will choose to believe.

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