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Contents abstracted by Future Survey, Future News and New Zealand Futures Trust.

Journal of Futures Studies

Volume 6 Number 2 November 2001

Tamkang University
Taiwan

WORLD FUTURES STUDIES
FEDERATION

Drawing and Storytelling as a Means for Understanding Children's Concepts of the Future: Research in Progress

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This paper reports preliminary results of a study investigating the effect of age and gender on children's ability to utilise verbal and non-verbal communication to construct and convey their concepts of the future (ie. knowledge of living organisms, their environment, and sociological relationships). The paper reports research in progress, drawing from a random sample of 12 eight-year-old children (from a total sample of 105). It provides five examples of children's drawings and stories to illustrate emerging socio-cultural themes in relation to children's outlook of the future.

Keywords: Futures, visual-verbal discourse, multi-modal communication, social semiotics, development, young children

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Futures Education and the Significance of Visual Symbols

The future is a complex concept that, metaphorically, can be described as a horizon with a continuously shifting perspective - it can be perceived from a number of different viewpoints. The term Futures Studies, described in the plural, is used to register the emphasis upon the multiple options available for the future, rather than reducing it to a single definable outcome (Eckersley, 1992; Page, 2000; Slaughter, 1994; Wright & Reardon, 1998). The goals of futures studies are to:

- encourage individuals not to fear change, but to feel they can influence events directly,
- go beyond the limitations inherent within the conventional separation of time into past, present and future, recognising each as linked within a continuum,
- highlight the fluidity of time through generations, where individuals are bound together by cultural processes (belief systems, mores, traditions, institutions, customs and values),
- develop skills which equip individuals to become autonomous and active creators of the future, such as, adaptability, imagination, fantasy, altruism, sensitivity towards others, conflict resolution, decision-making, resilience, empathy, an interest in other cultures, and skills in communication, problem solving and lateral thinking,
- encourage thought processes which develop concepts of probable, possible and preferable options for the future, and
- counter short-term solutions to problems with an understanding of broad social significance, affirming individuals' connections with the outside world of culture, society and the environment.

The culturally-focused emphasis of Futures education is compatible with a conceptual framework that honours the significance of symbols and their important role in the construction and reinforcement of belief systems and the bonding of communities through their ideologies (Bruner, 1996; Miller & Goodnow, 1995; Page, 1994; Wright, 1997). Symbols, such as visual images (eg. drawings) and verbal metaphor (eg. stories) provide a vitally important index of the aspirations of the cultures that generate them (Arnheim, 1954; Goodman, 1984; Holland & Valsiner, 1988; Malaguzzi, 1993; Walsh, 1993; Wright, 1997). Symbols convey generalised meaning to signify broad, abstract and philosophical cultural principles and beliefs - they are symptomatic of people's attitudes towards the future.

Futures studies stress the need for individuals to rediscover the power of symbols and to manipulate images and concepts as a means toward defining and identifying differing, new, modified and forged outlooks on the future (Page, 1994). Drawing is one symbol system where children use imagery, often more fluently and articulately than they do language, to explore ideas in visual terms, make connections between images and concepts, extend their responses, and gain new perspectives on the world (Wright, 1994). Children's use of the symbolic tool of drawing, particularly when accompanied by their storytelling about the visual images being produced, can help children overcome a potential sense of disempowerment.

The dual coding processes accessed through the visual and verbal symbolic domains of drawing and storytelling provides a rich opportunity for children to express their thoughts and feelings about the abstract concept of the future. This study, which is still in progress, draws on ethnographic and socio-semiotic principles to investigate young children's concepts of futures. Results of the study have implications for a number of fields, particularly early childhood education, sociology, psychology, curriculum theory and Futures education. The overarching objectives of the study are to:

1. examine the links between non-verbal (ie. drawings/gesture) and verbal (ie. stories) symbol systems, with sensitive consideration given to the children's use of visual/verbal metaphor in their semiotic depictions of futures, and
2. explore young children's socio-cultural concepts of themselves and their worlds in relation to their views of, and values associated with, futures.

The Significance of Multi-modal Communication in Depicting Futures

Our visual perception of the world undergirds our cognitive processes (Arnheim, 1954), and the use of visual symbols makes a substantial contribution to spatial intelligence - the comprehension of two- and three-dimensional shapes, objects, and relationships (Gardner, 1983). Through visual media, we draw upon social experience and language to communicate significant details about concepts, such as the future (Diederich & Wright, 2000). The visual-verbal expression of such concepts can be: *descriptive* (focussing on objects, events), *interpretive* (focussing on meaning, emotion, expression) and *formal* (focussing on design, technique) (Stavropoulos, 1996; Wright, 1993).

We tend to think that language is the cornerstone of cognition - language is seen as a mediator of thought and a tool for enhancing thought. However, the construction and communication of meaning involves more than simply language. Several symbol systems (eg. visual, spatial, aural, bodily-kinaesthetic) and forms of representation (eg. drawing, dancing, music) are engaged in multi-modal ways of thinking and working (Cope & Kalantzis, 2000; Sweet, 1996; Wright, 2000). Such multi-modal cognition involves the interconnection of language processing in relation to the nonverbal processing of world knowledge. Indeed, the encoding of information in multiple ways, rather than a single way, is better comprehended, recalled and elaborated.

Consequently, researchers and educators have advocated for learning opportunities that are more broadly defined, which include a full range of verbal and nonverbal symbol systems (ie. 'multi-literacy'). A multi-literacy approach to learning is consistent with the principles of Futures education, as it positions children as remakers, transformers and re-shapers of knowledge (Cazden et al., 1996).

Communicating via drawing and storytelling, for example, gives children the opportunity to use several inter-enriching "languages" or modes (ie. visual, spatial, gestural, vocally expressive). This increases children's capacity to communicate through representational, symbolic thinking (Haas Dyson, 1996; Eisner, 1994). Symbolic communication assists children to mentally manipulate and organise images, ideas, and feelings about complex subjects, and to use a rich amalgam of both fantasy and reality to portray life experiences, both literally and metaphorically (Wright & Reardon, 1998). This leads children to consider multiple interpretations, generate new meanings, and expand existing ones.

However, research that investigates the construction of meaning through multiple levels and forms of verbal-nonverbal, multi-modal communication is still in its infancy (Sweet, 1996). Studies that have applied multi-modal techniques generally have involved small samples, have centred on a limited age range of children, or have treated one symbol system as the "dominant" meaning-maker in relation to the other. Researchers, for example, have investigated language development supported by visual symbols (Haas Dyson, 1996) or visual symbols described through language (Stravropoulos, 1996). A few studies have investigated the synergy between visual and verbal symbolic communication in relation to children's high-order consciousness, such as children's depictions of sadness through drawings and stories (Wright, 1993), children's drawing development in relation to enculturation (Strauch-Nelson, 1999), and children's depictions of Futures (Page, 1994; Wright & Reardon, 1998; Wright, 2000). Such human

knowing involves speculation and foresight, and involves reflexive understanding in time - a high-order consciousness characterised by the ability to roam consciously throughout an extended present, and to speculate on futures yet to come (Slaughter, 1994).

Researchers have warned that many young people feel pessimistic about the future, and they approach life based on instant gratification rather than long-term goals or lasting commitment (Elkins & Sanson, 1996). Young people's views of the future appear to become increasingly negative as they grow older (Slaughter, 1994). As early as age ten, children can sense the world as being out of control, and can feel powerless in shaping their future (Eckersley, 1999). Consequently, there is support for an analysis of young children's understanding of futures, when their thinking is still imaginative, flexible, and linked to fantasy. These are qualities that futurists believe adults should seek to rediscover, and which young children begin to lose as they grow older.

Description of the Study

The specific objectives of the study were to investigate the effect of age and gender on children's ability to:

1. utilise verbal and non-verbal communication (eg. story, sound effects, gesture) and artistic application (*descriptive* - objects and events; *interpretive* - meaning, emotion and expression; and *formal* - design, technique) to construct and convey information, and
2. illustrate sophisticated concepts in relation to their:
   - environmental and social knowledge (*biological* - living organisms and their environment; and *sociological relationships* - human groups, resources and social-cultural patterns), and
   - outlook on the future (eg. fatalism, pessimism, optimism, conventionalism, unknowability and futurism).

Participants. Two schools in rural Queensland participated in the study, and 105 children were involved, with 35 children from each of the following groups: preschool (mean age 5.31 years); grade one (mean age 6.24 years); and grade three children (mean age 8.2 years); with an equal distribution of boys and girls in each group. For this preliminary analysis of work in progress, the art works and stories of six boys and six girls were randomly drawn from the two schools' grade-three sample.

Data Collection. The teachers, a research assistant and older members of the community discussed the concept of past, present and future with all children within each of the classroom groups, using anecdotes and a range of photographs to illustrate change in Australia over a period of about 100 years (eg. transportation, housing, fashion, shops).

The opening focus of the discussion was aimed at centring on an "in your lifetime" framework, but was open to extending the framework as far as possible in relation to the past and the present. The introduction to the discussion of the present in relation to the past and the future included statements such as, "Mrs. Smith is Mary's grandmother. Quite a while ago, Mrs. Smith was a little girl, just as you are young people now. In the time that Mrs. Smith has lived, she has seen many changes. What do you think the future would be like when you are as old as this grandmother? What changes might you see?". During this classroom-based introductory discussion, some issues that were raised by the children dated beyond a life-time perspective, and reached back into prehistoric times (eg. talking about Dinosaurs or the "olden days") or projected well into the future (eg. speculating about Intergalactic holidays).

When it appeared that the children understood the meaning of the word future (in relation to the present and the past), they were told that they would be asked to draw a picture of the future (they were given the choice to refuse, and permission had been sought from parents for their children's participation). Depending upon the physical context of each classroom, the child and research assistant worked either in a quiet area of the room or in a familiar space nearby. On a one-to-one basis, the children drew a picture using white A3 paper and a set of coloured felt pens (ie. a consistent range of colours was provided for each child).

The children were encouraged to discuss their drawing while they worked, however, those who preferred to work silently had the opportunity to tell a story at the completion of their drawing. The research assistant was trained to ask each child open-ended questions, seeking clarification and extension of his/her images and stories (ie. trials with children not used in the study were viewed and discussed by the research team to ensure the research assistant avoided leading or personally interpretive comments). To attempt to elicit the key focus of the visual/verbal content of the children's work, each child was asked to give his/her artwork a title - similar to how adults' artworks in galleries often have titles.

The sessions, which ranged between about 15-45 minutes in length, were video recorded. The camera was positioned so that it was reason-

ably inconspicuous, while being capable of capturing the children's literal and expressive language, the details of their drawing, and their use of gestures and facial expressions. The research assistant kept running records, summarising what was said. In addition, rough sketches of the children's images were made, and all images were numbered to record the sequence in which they were drawn.

Data Analysis. All of the 105 drawings and stories have been transcribed in full, aligning the non-verbal content (ie. gesture, image) with the verbal (ie. conversation between child and adult). A social-semiotic inquiry is being used to interpret how children have, through their interaction with their environment, made meaning of the phenomenon of futures. The qualitative analysis is inductive, and assumptions about children's views is being built as pieces of evidence are gather and grouped together as themes.

The theoretical suppositions to explain the data involve:

- descriptive, interpretive and formal aspects,
- references to biological relationships between living organisms and their environment, sociological relationships between human groups, the use of resources, and social-cultural patterns, and
- outlooks on the future.

An N-Vivo program has been set up to capture exact and complete details of the verbal and visual content in relation to emerging themes. Analysis of these transcripts will involve in depth visual-semiotic and discourse analysis, which will generate insights into the synergy between visual and verbal communication systems of children's high-order consciousness of futures. Preliminary processes for coding the data have been trailed on 12 eight-year-old child cases, and these processes will be refined as new categories/codes unfold. Quantitative analysis will also be used to look for frequencies of categories across age and gender in relation to children's prevailing outlooks and values.

Of the twelve cases presented in this preliminary analysis, five summaries of transcripts (three boys, two girls) are discussed to illustrate the types of themes that are emerging from the data at this early stage. Working "titles" of the children's drawings/stories have been given by the author to illustrate the key issues that were raised by the children, although most of the children simply titled their works "the future".

Preliminary Results

Many of the issues that emerged from the twelve grade-three children's drawings/stories are similar, albeit more cognitively complex, to that of the preschool children studied in Page's (1994) research. Consistent with Page's results, the children:

1. Associated age with difference through the framework of growth. Growing older enabled children to increase their level of knowledge and control over the world,
2. Located the future within a time scale, often interwoven with the past, present, and the future. Children created a "new" world, similar to the world they know, while adopting a global, time-related perspective for describing the future,
3. Described the future as a place where they would partake of their favourite activities (eg. fishing, roller-blading) and future employment (eg. racing car driver),
4. Considered wider social concerns (eg. pollution, environment), which are seen in relation to their own experiences and outlooks. A global dimension of the future, which is occasionally negative, often was within a positive and personally meaningful framework, and
5. Were influenced by the mass-media (eg. storybook and movie role models).

The five examples below illustrate some of the ways these aspects were expressed by this small sample and appear to be surfacing some emerging "themes": 1. evolution, 2. dual perspectives, 3. employment and/or activities, 4. population and social relationships, and 5. futuristic capabilities. In these examples, the italicised words are the working titles given by the author. Three full stops indicate that a segment of the transcript has been skipped over; round-bracketed words are qualifying content added by the author; and, square-bracketed words identify the segment of the drawing to which the verbal content is referring.

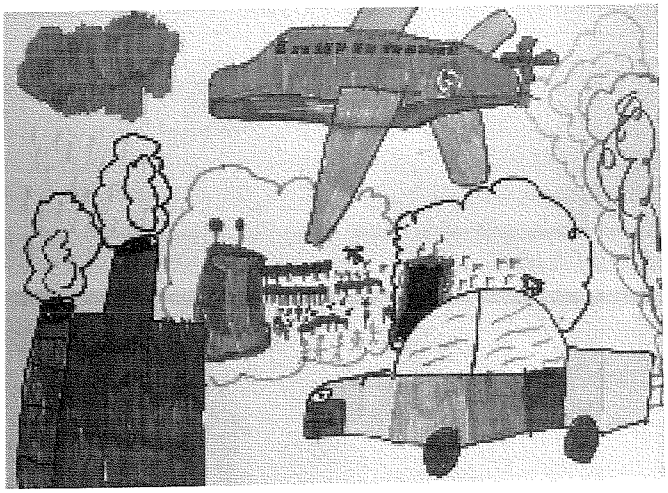
Evolution

In the following drawing/story of a grade three girl, the issue of age is associated with difference through the framework of growth, an increase in knowledge, and control over the world (Page, 1994). She discusses death in relation to animals and humans, life in relation to future medical advances and increased poverty, and the potential evolution of species based on how animals once used to be. Although it is difficulty to glean a great deal of information from the girl's visual symbols, these images provided a base from which she expanded and elaborated on her cognitive concepts.

Life-Death-Change (girl, 8.5 years old). "Mum said if my dog gets sick one more time, we're going to put him down... My dad said that dogs don't live as long as people... I would like a treehouse. I keep on thinking that my granddad would build one - before he went to hospital - because he got this sort of cancer thing. People (in the future) might be able to grow older than they can now. Then we'd get to see a whole lot of things... There might be different animals in the future, 'cos there were in the past. Like, an elephant, except that it doesn't have skin, it has fur - you know, like the dinosaurs. People might even have to sleep outside because - you know how in some parts (of the world) they're dying and that? It might come to Australia".

Dual Perspectives

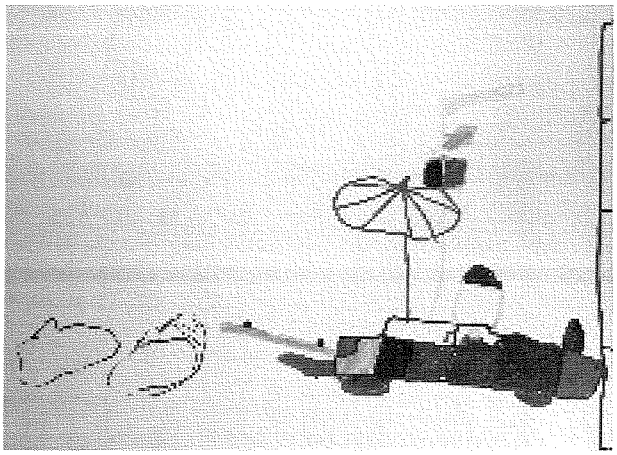
The issue of locating the future within a time scale, where the past, present, and the future are interwoven (Page, 1994), is illustrated in the following example from a grade three boy. By adopting a global, time-related perspective for describing the future, he simultaneously illustrates the world as good and bad. In the good component, he describes a beautiful, thriving, peaceful park, with a warning sign to educate people about how to prevent the extinction of the world's natural environment. The bad component of his drawing/story depicts a future that is overwrought with noisy, fast vehicles and high-tech buildings, and a polluted environment where humans and animals have difficulty surviving.



Killing our Environment (boy, 8.2 years). "There will be a lot of trucks, cars, motorcycles and planes. The cars will be a lot faster, with a lot more smoke. Aeroplanes will have a propeller to make them go a lot faster and can fly below the clouds. Things are getting busier and noisier. There are electricity centres or plants with smoke coming out. There is smoke coming from the cars and planes, joining to make more pollution. Acid rain [brown cloud] is caused by the smoke and has pollution and chemicals. The ocean will be polluted because whenever we got more buildings, we start not caring about what we already had.There is a park [centre, blue outline] with trees in the distance, flowers, a waterfall, and birds flying around. There is a sign that says 'they're going to be gone'. We're not looking after it. And it's mainly all our fault, not the animals'. Humans have been cutting down trees and taking other people's treasures they've worked a life time to keep. There is a dead bird on this side [right, black outline]. Birds can't survive here. None of the people walk here like on the good side".

Employment and/or Activities

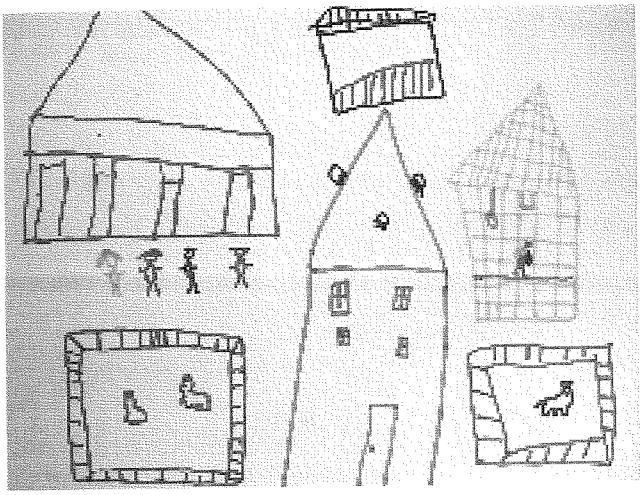
The issue of describing the future as a place where we will partake of our favourite activities and employment (Page, 1994) is illustrate by a grade three boy. In his 'new' world, all people have a mobile existence, by living in their cars, and accessing modern conveniences at key strategic places. Children participate in 'virtual education' with the help of their parents, but parents don't have to work, because everything is free.



On Permanent Holidays (boy, 8.6 years). "There is a car, with a wave pool [top], a tall diving board, and a bed on the back with straps so you don't fall off. The umbrella that goes up when it's hot. There are a lot of these cars around. It's a normal, everyday driver. The car is fast - instead of wheels, there are bumpers with magnets, and it skims above the ground. It's powered on a jet engine [chimney at front] with fire inside [flames out the back, with smoke puffs]. The TV [black and brown box on pole] and radar [pink disc] tell you when storms are coming and let kids have video games. You can live on this car, but you have to mail your school work. A motorcyclist picks up the school work and delivers the mail. Adults don't have to work - they have to help the kids with school work, like a teacher. People live in their cars instead of houses. They travel a lot. There's a tall building in town [far right] - you can use its facilities without paying money. Everything is free. People go there when they're tired of driving."

Population and social relationships

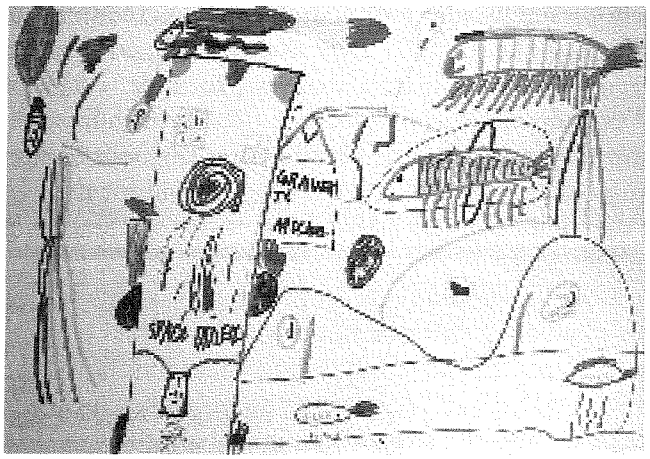
Wider social concerns and a global dimension of the future are seen in relation to personal experiences and outlooks (Page, 1994) by this grade three girl when she describes a quiet, spacious country existence. In her discursive description, properties will be built, using natural materials; houses and cars will be bigger to accommodate more people; and there will be comfortable and safe facilities for various animals. The environment will be self sufficient, using solar power and bore water, and the people and animals will collaborate to maximise efficiency, conserve resources, and share jobs.



Conserving/sharing Resources (girl, 8.7 years). "I will be living in the country where there is space and it is quiet. The towns are noisy; there are machines and development. There is solar power on the house for hot water and for the lights and fans. They use bore water and the house is built of wood and bricks. The house will have longer lounges for more people - long seats along the table instead of individual seats. The car has seats for six and a big boot. There will be paddocks for horses and cows [bottom left], an aviary to keep lorikeets [right central], and a milking shed [top central]. There will be a horse to round up the sheep, and we will ride it to the mailbox - to save fuel. There is a pet cat and dog to help round up the animals - the cat is kept inside most of the time so it can't get into the aviaries. The sheep's wool can be woven and made into blankets, jumpers, and other things. I might have a job as well - work in the town as a nurse - about a week per month. I will employ people to work on the farm - shearing. The shearers might also have part-time jobs as builders".

Futuristic Capabilities

This final, grade three boy's drawing/story appears to be influenced by the mass media (Page, 1994) and, in particular, knowledge drawn from science fiction books, films and other sources. Although a great deal of this transcript has been omitted due to its length, the boy describes a time and space on a gravity-less 'new' planet which includes humans, aliens and mutated aliens, cars that are controlled by the mind, space ships that are powered by human emotion, and a type of force field that leads to a dimension that only the aliens have crossed.



Through the Mindlines to the Other Dimension (boy, 8.5 years). "... It's about the year 5000. There is a planet/place located in relation to Mars [top left], kind of like the sun, but it's all red. Earth [middle] is *aaaalllll* the way back here. It's got all the blue water and everything, and the Sun [right of Earth]. People from Earth explore here. From here they get stuff from Earth.

... The building [tall thin rectangle left of centre of page] has weights to hold it down so gravity doesn't pull it up [black circles outside building]. The Gravity Machine [house-shaped object, top right of building] pumps gravity into the building so humans don't fly around. Everything is made of space metal so hardly anything can get through it. Some use the door, but the aliens use the Time Warp [blue, concentric circle below windows of building]

The building has alien stoppers that are like alarms to keep the aliens out [red balls on the side of the building]. Some are real aliens, some are mutated humans who look like aliens - mad doctors made 'em, (I) think.

... Cars hover 8 centimetres above the ground [lines under oval-shaped cars at bottom]. The cars don't have steering wheels - they are controlled by mind power and you wear a headset. The cars are powered on grass [green lines shooting out from behind cars] and people have to go to Earth to the 'grass stations' to get it. The aliens found out people were trying to grow grass for their cars and killed them. Aliens don't have cars - they fly. This one's a police alien [flying character, top and central] with a jet pack that goes on and off [parachute-type object off the back of the alien]. It has an emergency shoot with a gravity machine on it if the pack crashes - to help him land.

... The Grub Alien Ship [top, right-hand side] has flashing sirens on top and holds aliens who look like grubs. There are humans on board who are kind of like the FBI - they stop robbers, do alien work. The ship is powered by human's fear, scaredness, surprise. Aliens make humans scared - they do it surprise - because they know humans like surprises. Right now they are on a case, chasing after the police alien who's smuggling drugs - he forgot police cars can go to jail for that. The aliens are making the 50 humans on board get surprise so they can go faster than the alien's jet pack.

There is a line no one can cross 'cause no one's explored there yet. They are like beams of light all attached together - mindlines - going down, so everyone knows not to go past there [rainbow-type lines on left-hand side]. The aliens can cross over them 'cause they were the first ones to be here, but humans can't. The mutated alien knows what's past there, but the grub aliens don't. Some people keep trying to get past there, but the mindlines give people electric shocks - like static shocks when you rub your feet against carpet and then you touch people like them. We don't know if the aliens who have gone past there are good or bad - the aliens over there might kill them... The rest of the world isn't going up there yet. It's just America who can, 'cause they've got all the money to do everything".

Conclusions

As is illustrated in the examples above, drawings and stories provide cross-modal, symbolic tools through which children's concepts and feelings can be expressed. In relation to the first research question of this study, five key issues seem to characterise of the ways in which these eight-year-old children approached the drawing/storytelling task, to construct and communicate their ideas verbally and nonverbally. [Similar characteristics have been described by other researchers (see Cope & Kalantzis, 2000; Haas Dyson, 1996; Page, 1994; Strauch-Nelson, 1999; Stavropoulos, 1996; Sweet, 1996; Walsh, 1993; Wright, 1993)]. These five characteristics will be described in general, with examples from the small sample. More in-depth illustrations will be provided in relation to the final case described above (ie. the boy's futuristic drawing/story).

Characteristic One: Of the visual-verbal domains employed, one symbolic domain often enriches or informs the other. In other words, the sequence of the story and/or picturing of events and objects often evolve

through an interactive relationship between words (including sound effects and gesture) and images. This characteristic was evident in virtually all children's drawings, and was particularly noticeable in the girls drawing *Life-Death-Change*, where the visual content was elaborated in much greater detail than was the visual content. To illustrate with the boy's futuristic discourse, his images and verbal explanations did not unfold as a sequence of events as one might find in the telling of a story but, rather, shifted in and out of the overall framework, where the 'story line' evolved in bits and pieces. He frequently was one step ahead of the research assistant, explaining the meaning of what he had just drawn, while simultaneously drawing a new concept. Often he returned to previous images to elaborate ideas and to extend the storyline through the use of additional visual and verbal details. In many ways, there was an interactive depiction of objects and events, although the overall content was often piecemeal, rather than occurring in a linear fashion.

Characteristic Two. Children often used images, words, sound effects and gestures to punctuate and elaborating the visual-verbal content. For example, in the futuristic drawing, when the boy drew the earth in relation to Saturn and his "new" planet, he gestured and emphasised the relative distance between the planets by expressively saying, "Earth is *aaaaalllllll* the way back here". At a later point in the drawing/story (not discussed earlier in the shortened transcript), he pointed to the hovering cars and moved his hand across the drawing to show how the cars travelled through the underground tunnels. Coupled with specific marks, such as the red lines below the cars to indicate that they were hovering, and the green 'grass exhaust fumes' projecting from the back of the cars, he was able to visually symbolise the action or movement of the cars to reinforce his verbal descriptions. In addition, he used sound effects to reinforce the action of the cars [top and left-hand side of the drawing] as they spiralled downward, while crash-spinning out of the tunnel. As the boy moved his hand across the artwork to illustrate how the cars missed the landing dock, he dramatically accompanied this action with a descending "Ahhhhhh".

Characteristic Three. Children often blend reality with fantasy, fact with fiction, and seriousness with humour. This was evident in the drawing *On Permanent Holidays* (eg. where the bed is strapped on to the back of the car so you don't fall off), and in many other examples. In the example of the futuristic artwork, the boy's conceptual grasp of space-age issues was quite sophisticated, and many aspects of his unfolding events were fantasy-related (eg. fear-powered space ships chasing a mutated police

alien). Serious-humorous issues were juxtaposed through comments such as "police cars can go to jail for [smuggling drugs]". He also made a bit of a pun when he referred to "grass stations" (ie. the media-learned American term for gas stations), and linked this to the serious issue of humans potentially getting killed if the aliens knew they were going to Earth to get more grass. Both serious and humorous statements were made in an innocent matter-of-fact way, using reporting characteristics similar to that of a science-fiction narrator or a newsreader.

Characteristic Four. Children's main characters/objects/events often are juxtaposed with their personal perspective (eg. in *Killing our Environment*, one boy commented that "it's mainly our fault, not the animals" that the birds, flowers and waterfalls are "going to be gone"). In the futuristic example, at one point (not reported in the earlier transcript), the boy drew a small yellow circle at the top centre of the page. He then stated that, even though the interviewer might have thought it was another planet, it was simply one of his helium-filled balloons that he had let go. He made this balloon event an extension of his knowledge about gravity, gesturing how the balloon went so high that it burst (at which point he added a small black mark to show the puncture). After this diversion of seemingly personal content, he then shifted his attention back to the human and alien characters on his fictitious planet in the year 5000.

Let us turn now to a discussion of the research findings in relation to the second research objective - to explore young children's socio-cultural concepts of themselves and their worlds in relation to their views of, and values associated with, futures. It seems apparent that many of the drawings and stories were influenced by the media (eg. science fiction) and school content (eg. social-studies curriculum, religious education). Other influencing factors on children's depictions of futures would include their home and out-of-school experiences. However, details of these latter factors (eg. what the children were learning out of school through books, TV, internet games or other sources) were not sought at the time of the data collection. This could be seen as a limitation of the research project, and collecting such information is an important consideration for future research of this nature.

Nonetheless, the detailed documentation of a relatively large sample of children's drawings and stories, in and of themselves, provides rich data for exploring children's ways of verbally and non-verbally communicating ecological knowledge and outlooks on the future. Even within the five examples provided in this paper, a number of concepts emerged in relation to children's outlooks on the future:

- Biological relationships between living organisms and their environments (eg. "There might be different animals in the future, 'cause there were in the past"; "The ocean will be polluted because whenever we got more buildings, we start not caring about what we already had"; "We're not looking after [our environment], and it's mainly all our fault, not the animals'"; "The towns are noisy. There are machines and development"),
- Sociological relationships between humans and human groups ("The house will have longer lounges for more people. The car has seats for six and a big boot"; "I will employ people to work on the farm, shearing. The shearers might also have part-time jobs as builders"),
- The use of resources ("Humans have been cutting down trees and taking other people's treasures they've worked a life time to keep"; "People live in their cars instead of houses. They travel a lot... Everything is free"; "The sheep's wool can be woven and made into blankets, jumpers and other things"; "The cars... are controlled by mind power"; "The aliens are making the 50 humans on board get surprise so they can go faster than the alien's jet pack"; "The rest of the world isn't going up there yet. It's just America who can, 'cause they've got all the money to do everything"),
- Social-cultural patterns (eg. "People might be able to grow older than they can now. Then we'd get to see a whole lot of things"; "People might even have to sleep outside because - you know how in some parts of the world they're dying and that? It might come to Australia"; "The mutated alien knows what's past [the mindlines]... We don't know if the aliens who have gone past there are good or bad. The aliens over there might kill them").

Further analyses of the complete data set will explore these factors and the children's values (eg. caring, beauty and power) in relation to ecological knowledge and outlooks of the future. In addition, age and gender trends will be analysed in relation to children's feeling of empowerment to shape the future (eg. fatalistic, pessimistic, optimistic).

Although age trends cannot be reported until all data have been coded, a 'first pass' of the complete data set suggests there is an increasing awareness, with age, of negative aspects of possible futures. Compared to the younger children, many of the older children depicted concerns about the physical/environmental and human components of the world. The

preliminary overview of the data also suggests that girls appear to have an interest in social relationships (eg. giving people magic flowers that make them want to be kind to each other), while boys appear more interested in futuristic, technical aspects (eg. having numerous surveillance cameras to monitor crime in the environment).

Using N-Vivo, specific themes will be analysed across the total sample, and age and gender trends will be identified both qualitatively (by identifying specific images and words related to thematic content) and quantitatively (by identifying the percentage of boys and girls in each age group who dealt with common themes). The qualitative and quantitative data will be integrated to provide rich examples of the themes in relation to age and gender (eg. specific examples of preschool girls' images-words surrounding the theme of "the use of resources"). This will unfold a picture of young children's cross-modal discourse in relation to their ecological knowledge of, and outlooks on, the future. The results of the study should have implications for a wide range of disciplines, particularly in relation to children's cognitive and social development, multimodal communication, visual-verbal discourse, early childhood and futures curriculum development, and social-semiotic theory and research.

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Close Relations at a Distance

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Cyberspace is changing family life and other interpersonal relations. We link this theme to a general discussion of the relations between technological change, social change, and value change.
The Internet has already transformed interpersonal relations profoundly. Through the Internet, people create and maintain close social relationships. As a result, cyberspace promises to become an ever-greater basis for information sharing, social support, practical assistance, and intimacy. Thus, family relations - though radically decentralized - will continue to serve as a fundamental source of social and emotional meaning, despite radical social changes in other domains of life.
However, our conceptions of family life, and our expectations of family members - of spouses, parents, children, and siblings in particular - are bound to change as a result. Additionally, our cultural conceptions of "closeness" and the connections between public and private space will change too. How these changes play out - how quickly, and to what degree - will vary from one culture to another. However, no society will be untouched. It is unclear, finally, what will be the moral implications of these changes for relations between spouses, parents and children, siblings, and other kin. This is an area that deserves closer attention.

Keywords: family, communication, distance, technology

* I am grateful for comments and useful suggestions received from my friends and colleagues Wendell Bell, Linn Clark, Jim Dator, Sohail Inayatullah, Susan McDaniel, Tony Stevenson, Charles Tepperman, and Barry Wellman. Prepared for the ISA International Congress, Sao Paulo 17-19 September 2001 "Universal Values and the Future of Society" with the assistance of Karen Root.

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