

## Multi-Modality in a New Key: The Significance of the Arts in Research and Education

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*Multi-modality and the use of non-verbal symbolic expression often is suppressed in institutionalised education, due to the social and cultural dominance of literal language and written modes of expression. However, non-discursive forms of expression are significant avenues for making cognitive, emotional and "spiritual" connections that are key to deep learning. Artistic meaning making integrates the visual, spatial and bodily-kinaesthetic modes, and its discourse utilises a range of "texts" - the worlds of still and moving images, sounds, gesture, body language and expressive vocalisation. Artistic discourses connect the body, thought, and emotion in ways that cannot be replicated in other areas of the curriculum.*

*This paper describes two studies, and illustrates how children use multi-modal expression to interpret, construct and manipulate symbols in art, music and storytelling. It describes children's transduction of meaning across visual, verbal, spatial, and bodily-kinaesthetic modalities while: (a) making drawings (stemming from imagery and visual memory), (b) creating story (to accompany their artworks), and (c) utilising descriptive, interpretive and formal qualities within art, music, story and non-verbal communication to create and communicate meaning. It illustrates how the visual-verbal domains enrich and inform each other as children manipulate and organise images, ideas and feelings, using a rich amalgam of both fantasy and reality. Examples from the children's drawings/stories and their interpretations of emotion in art and music illustrate how they embellished their works with expressive vocal inflection, gesture and body posture, and interpret such qualities in the music and art of adults.*

Anyone who has had intimate artistic experiences (e.g., as a creator, performer or teacher) would appreciate the special ways in which the processes of thinking, feeling, knowing and communicating take place in the arts (Eisner, 1996). The arts provide significant avenues for cross-domain understanding. For instance, dancing while simultaneously singing the melody and lyrics of a song requires the "multi coding" of cross-domain information - movement through space while dancing specific patterns, *plus* accurate vocal reproduction of specific pitches in a particular rhythm, *plus* the timing of these with lyrics with the melody line.

It seems that cross-domain encoding of information is better comprehended, recalled and elaborated than if only one domain is used (Sadoski, Paivio, & Goetz, 1991). In the arts, however, the predominant form of information processing often is through *nonverbal* domains, such as encoding still and moving images, sound/music and movement in space (Sweet, 1996; Eisner, 2001). Such information processing involves the integration of thought, emotion and action; thinking through imagery and with the body; and turning action into representation.

### **Thought, emotion and action**

Bruner (1986) described learning as a multifaceted process in which thoughts, emotions, and actions do not occur in isolation, but are aspects of a larger, unified whole. He suggested that drawing boundaries between thoughts, emotions and actions would only require us to construct unrealistic conceptual bridges to connect what should never have

been separated. He argued that people "perfink" - that is, they perceive, feel, and think all at once, and act within the constraints of what they perfink (p. 118). More recently, others have discussed similar concepts using a different framework for describing three key sides of artistry - creativity, valuing and "spirit". Each of these three modes contains the other as a whole, while still remaining distinct (Best, 2000b). Artistic thinking, or creative intellect, relies heavily on the integration of visual-spatial imagery with the movement of the body.

### Thinking through visual-spatial imagery and the body

Arnheim (1969) coined the term "visual thinking" as a concept to challenge philosophers and psychologists who, at that time, did not acknowledge the intertwined connection between perceiving and thinking. He asserted that all truly productive thinking takes place in the realm of imagery, and that images underlie language (Becker, 1993; Wong, 2001). He provocatively described purely *verbal* thinking as "thoughtless thinking", saying that, although verbal thinking is useful for information retrieval, it is basically "sterile" thinking (Arnheim, 1969). Langer (1924/1971) also discussed the limitations of language, and described non-discursive, or visual forms of thinking, as being particularly well suited to the expression of ideas that are *too subtle* for speech.

The arts involve non-verbal processing of information, drawing on visual, spatial, aural and bodily-kinaesthetic forms of knowing. Gardner (1983) and Wright (2003) describe how music, for example, constitutes a type of intelligence that requires sensitivity to sound, the use of musical memory, responsiveness to sound sequences and structures, and emotional connections through metaphoric and expressive understanding. The visual arts are strongly embedded in spatial intelligence and centre on abilities such as forming mental models, creating and transforming mental imagery, and producing graphic likenesses of spatial information. Spatial intelligence is strongly connected with all of the arts, particularly dance and drama, and involves the ability to imagine movement and to think about spatial relations in terms of body orientation. Such body-based knowing is the essence of bodily-kinaesthetic intelligence and the capacity to use the body for expressive purposes. It involves working skilfully with objects and materials using both the fine motor movement of the fingers and hands and the gross motor movements of the body.

The link between image, thought and movement has been well documented for decades. Piaget (1951) described sensorimotor intelligence as thinking with the body. Young children's body-based thinking involves *action*, which helps them develop *concepts*. Currently, increasing attention is being given to the cognitive functions of *imagery* and the *body* as a source of order, which exceeds that of language and logic. In fact, the brain and the mechanics of cognition have become the focus of major scientific, medical, and education research on imagery and the body (Moen, 1991; Ross, 2000; Walker, 2000).

Through the sensory experiences of the body, we form representational frameworks for thought, which Johnson (1991) called "image schemata". These image schemata are crucial to the ability to understand experiences and to make sense of our environment - they form the basis of human reasoning, inference, logic and meaning. Image schemata are fundamental components of knowing and communicating. Through the use of the body, we form representational frameworks using images, and spatial and aural modes of thinking. This form of understanding is referred to as *somatic* knowledge - it links the body, "soul" and mind (Best, 2000a; 2000b). The "thinking body" gathers information through exchanges between the psyche (i.e. mind) and the soma (i.e. body). The five senses and emotions become the conduits of these experiences (Ross, 2000).

Particularly in the arts, our thoughts and emotions are fundamentally linked with muscular activity. A "spatiomotor mode" connects the spatial and the physical - it activates and

controls performance (Gardner, 1983). In essence, music is based on motor patterns, spatial concepts and movement metaphors (Carterette & Kendall, 1999; Walker, 2000). This fundamental connection between the physical and spatial aspects of music is an issue that many ethnomusicologists have explored. Some ethnomusicologists claim that music and dance are part of a human *biogrammar* of communication. In fact, there is evidence that the cognitive link between music and movement is much closer than the connection between music and language (Baumann, 1995; Walker, 2000). This union of body and mind is most obviously demonstrated in musical and dance performance, but is true also of the work of the painter, sculptor, potter and actor; there becomes a union between bodily-kinaesthetic understanding and thinking, feeling, and doing. Through such integrated understanding, we are able to express thoughts and feelings through representation.

### Turning action into representation

Representing the world, or capturing reality through experience, is a significant component of the arts. Representation involves the integration of enaction, imagery, and the construction of symbols (Bruner, 1996). It is the *enactive* mode that blends "thought, emotion and action". Through action, we portray or depict thoughts and emotions by example. This is particularly evident in children's pretend play, where they represent ideas and feelings by capturing, say, power and strength, or nurturance, through movement and the use of props and other resources - they enact or represent ideas and feelings through action.

The second mode of representation is that of *imagery*. Images can be thought of as stopped action frames, or visual impressions of actions. Our power to render the world in terms of images provides us with a conceptual understanding of how we operate in the world. For example, we create images when doodling, picturing, designing, mapping or diagramming. Imagery is also involved at a more expressive and abstract level in music (e.g. imaging a glassy pond while listening to a particular piano concerto), in dance (e.g. imaging the delicate, random movements of a butterfly) and in drama (e.g. imaging the body-stance and gestures of a sun god).

The third mode, *symbolising*, involves representing or showing a likeness between one thing and another. Humans have invented a number of symbol systems for representing, such as art, music, maths, physics, language, dance and history. We use these symbol systems to made ideas and experiences a public, shared form of communication, where the viewer/listener is enabled to understand what is being communicated.

The field of semiotics, which involves the study of individuals' uses and interpretation of symbol systems, focuses on a range of media for communication (i.e. "sign systems"). "Signs" may be words, images, gestures, numbers or anything from which meaning may be generated. Semioticians commonly refer to films, television, art works, advertising posters, music and dance as "texts" which are "read". Interpretation of a "text" involves us in recognising signs and, then, in elaborating and reflecting on the meaning of these signs. Such means of communicating also are referred to as "Discourses" (i.e. ideas and concepts filled with values, messages and histories). Discourses *integrate* words, acts, beliefs, attitudes and social identities as well as gestures, glances, body positions and clothes (Gee, 1989).

Our participation in the arts involves meaning making and meaning interpretation using a wide range of texts and forms of representation. Whether painting a picture, composing music, creating a dance, or refining a dramatic enaction, representation involves a process of imitation, where we:

turn actions into images;

- sequence actions and images in relationships;
- work to a system of signs (e.g. words, images, movements, sounds); and
- share the artwork with a community of other minds.

It is significant that many of the forms of creating and interpreting meaning are found *exclusively* in the arts. Artistic languages engage unique forms of cognitions where we depict objects, events and images through music, dance, graphics, drama, gesture and the expressive use of the voice and movement. In this way, we not only *makerepresentations*, we also *manipulate* representations in abstract ways. We engage in the *discourse* of art, music, dance or drama through sensory, tactile, aesthetic, expressive and imaginative forms of understanding. We learn such artistic discourse by using artistic symbols and visual, spatial, aural and bodily-kinaesthetic modes of communication. This connection between the body, thought, imagery, emotion, action and representation is what makes the arts a highly important component of education. The arts offer multi-modal and somatic forms of knowing and communicating that cannot be replicated in other areas of the curriculum.

### **Early Development of Multi-Modality and Somatic Knowing**

Multi-modal feeling and knowing is significant conduit for helping children organise and make sense of their environments. For instance, young children's multi-modal ways of knowing frequently are reflected in how they verbally describe their experiences. Kress (2000b) provided an example of a three-year-old using a physically based metaphor while attempting to clamber up a very steep, grassy slope. The young boy said, "This is a heavy hill", using a bodily-kinaesthetic kind of system to express something like "it is really hard; really heavy work for me to climb this hill" (p. 155). Because the child didn't have the word "steep" as an available resource in his vocabulary, he used the term "heavy" - he chose the most apt form within his existing knowledge that most easily matched his physical understanding of the level of energy required to climb the hill.

These types of expressions of children are part of the process of *synesthesia* - the transduction of meaning from one semiotic mode to another. In other words, the meaning from one mode (e.g. visual) is understood in another mode (e.g. spatial, aural or bodily-kinaesthetic). As adults, we too will often visualise a thought before the words come, or hear a word and many visual and audio senses come to mind. One mode of meaning slips over to describe meaning processed in another mode. Commonly we use metaphors to describe this cross-over of modes, such as when we talk about "imagery" in written text, or "perspective" and "points of view" in oral arguments (Johnson, 1991; Kress, 2000b). In fact, it seems inevitable that we use postural and bodily-kinaesthetic metaphors to communicate the qualities of our affective states. We all know, for example, what is meant when someone says that they were made to feel "small", or were "weighed down" with care, "stiff" with fright, "heavy" with apprehension, "light" as air, "depressed", and so on. The use of such expressions is not unique to the English language (Swanwick, 1988, 1999).

The arts often involve such body-based metaphor. As with the case of the boy describing the hill as heavy, many concepts that children acquire in the arts emerge through felt thought and emotional logic. Using this logic, children express and interpret meaning through sensory- and affective-based metaphor. Musical phrases, for example, can be described in terms of weight, size, stiffness, outward or inward direction and degree of activity at a statistically significant level by children as young as seven (Swanwick, 1999). Across cultures and language barriers, we consistently use somatically-based metaphors, such as "heavy music" to express how music connects with our body, soul and mind. We describe sound qualities as dark, light, warm, lilting or sprightly and interpret these expressive

characteristics based on our perception of the music's apparent weight, size, forward impulse, and manner of movement (Worth, 2000).

Because "objective" language is not always adequate to describe music, we often use metaphor, but this can even be inadequate - we are, then, driven to gesture (Snyder, 2001; Walker, 2000). For example, when illustrating the length of a musical phrase, we often "draw" a long arc with our hand, indicating the beginning and the ending of the phrase. We use expressions such as, "feeling" a phrase. This is not a linguistic concept like, "a phrase is a musical sentence". Instead, "feeling" is linked with space and movement and our bodily experience in it. Such forms of somatic meaning are not literal; they are poetic.

Children also invent their own rich and articulate representations of songs by showing, for example, the rhythm of the words (Davidson & Scripp, 1988). The line "life is but a dream" from the song *Row Your Boat*, might be represented as O o O o O O O (i.e. long short long short long-long-long). Children also show the descending pitches, for example, as:

lyfe

is

But-a

Dreem.

Hence, much of young children's understanding and expression in the arts is metaphoric, somatically based and, often, involves synesthesia. This is true not only in music, but in all arts disciplines. Particularly with young children, who may not have the vocabulary to describe their concepts verbally, their expression often is cross modal. The next section provides examples of two research projects involving 5-8 year old children's use of cross-modality while: (a) creating drawings and stories about their concepts of the future, and (b) while identifying, describing and interpreting emotions in happy, sad, angry and tranquil examples of music and art.

### **Multi-Modality: Art and Story**

Communicating via drawing and storytelling gives children the opportunity to create and share meaning using two modes: the non-verbal (i.e. graphic depiction stemming from imagery and visual memory) in collaboration with the verbal (i.e. creating a story that accompanies their artwork). Such cross over of modalities increases children's capacity to use many forms of representational thinking. Most importantly, it allows one symbolic domain to enrich and inform the other (Haas Dyson, 1992; Eisner, 1996). When children can use more than one symbolic domain at once, they are liberated to mentally manipulate and organise images, ideas, and feelings, and to use a rich amalgam of both fantasy and reality to portray life experiences. Such portrayals often are both literal and metaphoric (Wright & Reardon, 1998).

Children's drawings-stories can give us a perception of how they consider multiple interpretations, how they generate new meanings, and how they expand existing meanings while drawing and describing their processes. Children enhance their drawing-story through the use of sound effects and gesture, often to clarify their meaning. Through drawing and

story telling, as in all areas of the arts, children communicate their thoughts and feelings through artistic treatment, which may be:

*descriptive* - about objects and events;

*interpretive* - involving meaning, emotion and expression; and/or

*formal* - using design, technique and artistic elements (e.g. colour, texture, plus other elements in domains besides the visual arts).

The amalgamation of the descriptive, interpretive and formal elements can unleash in children a greater depth of understanding than can be obtained when using only a single mode of expression (e.g. storytelling on its own, without the use of image-making, gesture and vocal expression). Particularly when presented with an abstract concept, such as depicting "what the future will be like", children's consciousness can be liberated to roam throughout an extended present, and to speculate on futures yet to come (Slaughter 1994). By analysing the various "texts" children construct to depict the future, we can glean insights into their concepts of issues such as living things (e.g. humans, animals, plants), their environments (e.g. homes, forests, oceans), human groups (e.g. families, institutions, nations), the allocation and use of resources (e.g. transportation, technology, agriculture), and socio-cultural patterns (e.g. education, employment, leisure). Children's drawings and stories also can provide a window on their outlook, and whether they view the future optimistically, pessimistically, fatalistically, futuristically or in other ways (Wright, 2001).

Wright's study, which involved 120 five to eight year old children in drawing a picture of the future, investigated such issues. While discussing their artwork either as they worked or at the completion of the drawing, children interacted individually with an interviewer who listened and asked open-ended questions to seek clarification and extension of their images and stories. The drawing-story experiences illustrated many examples of children's use of somatic forms of communication - children embellished their works with expressive vocal inflection, hand gestures and body posture/position.

Figure 5 provides an example of a grade three (8.5 years of age) boy's drawing and story and illustrates the cross-modality of his meaning making (words in the transcript that are square bracketed refer to the location of the specific images in relation to the verbal content). Toby (pseudonym) appeared to have been influenced by the mass media and, in particular, his knowledge seemed to have been drawn from science fiction books, films and other sources. Although a great deal of the transcript of Toby's story has been omitted due to its length, he described 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.



**Figure 5. Through the Mindlines to the Other Dimension**

"... 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 aaaa///// 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".

As is illustrated in the example above, Toby's drawing and story involved cross-modality, where the visual and verbal domains enriched and informed each other. Toby's sequencing of the story and/or picturing of events and objects evolved through an interactive relationship between words and images. Yet his images and verbal explanations did not unfold as a linear sequence of events (Kress, 2000 a, b). Rather, Toby's ideas and depictions shifted in and out of the overall framework, where the "story line" or overall structure of the drawing-story evolved in bits and pieces. He frequently was one step ahead of the interviewer, explaining the meaning of what he had just drawn while simultaneously drawing a new concept. In addition, he returned to previous images frequently to elaborate his ideas with visual detail, and extended the storyline in relation to these new concepts. In many ways, there was an intimate interplay between the story and the graphic depiction of objects and events, yet the unfolding of content was not always presented in a linear fashion, nor did it conform to adult-defined sequence structures. While the content might appear "piecemeal" when viewed through an adult lens, the overall framework evolved in similar ways to how young children's socio-dramatic play unfolds. However, the interaction was not social in the sense of a child-to-child interaction, as you might find in socio-dramatic play. Rather, it was a personal fantasy-based experience, depicted on paper - the interaction occurred between the image and the story, and it unfolded similar to that of a story board for a film, with layers of visual action, character development, scenery and scripting working in harmony, simultaneously.

This integrated form of communicating was further extended by the use of expressive words, sound effects and gestures that punctuated, elaborated and enhanced the visual-verbal content. For example, when he 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 *aaaaa!!!!!!!* 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, along with 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 Toby moved his hand across the artwork to illustrate how the cars missed the landing dock, he dramatically accompanied this action with a descending "Ahhhhhh" and a downward arm movement.

Toby's somatic depictions were expressed through concepts of:

- gravity (buildings having weights so they aren't *pulled up*; buildings being *pumped* with gravity to keep people from *flying around*; a jet pack gravity machine *tobring the alien back* to earth);
- mind power (cars *controlled* by mind power; the alien ship *powered* by human fear/energy); and
- futuristic forms of travel (aliens *go through* the Time Warp rather than use the door; cars *hover* above the ground; aliens *fly* using a jet pack; mind lines prevent humans from *crossing over*; they give humans *electric shocks* if they try).

Like Toby, many of the children in the study used fantasy in their depictions of the future. For example, one girl drew a mother with yellow hair and said that, in the future, the mother would be able to simply wish her hair to be any colour and it would change by magic. Children's content included futuristic concepts, as in Toby's case, and a range of other concepts pertaining to their outlooks of the future (Wright, 2001).

The task of drawing a story of the future was, by design, story-oriented, because children were asked to depict their ideas through drawing and to talk about this process. Consequently, the children's content generally was *descriptive* in nature - it revealed the unfolding of events in relation to objects and living things. However, the task also involved *interpretive* aspects. It required meaning making and meaning communication, which often tapped into emotion. Such interpretive components involved the use of humour and expressive verbal and gestural language. This enabled children to enhance aspects of the artwork that were not easily depicted in a still, 2-D format. To compensate for the limitations of the visual-verbal aspects of expression, children used gesture to clarify movement and spatial-temporal aspects of their artworks, such as (Wright, 2003; in press):

Using fingers to show how a person would walk up stairs, while saying "See! Step, step, step",

Using a thumb to push into the paper to illustrate how a hole-digging machine shifts the earth, while saying "It's gotta go dig...dig...dig...dig...dig". This gesture included pointing across the bottom of the paper, under the drawing of the grass, and up to some stairs that lead to where the tunnel will come out,

Using hand movements to show how the person in the picture works a remote control to monitor the movements of cars (e.g. waving hand around, looking around the room, showing how you can lift a car off the ground and stack it in a rack with other cars to save storage space),

Using hand and arm gestures to illustrate how fuel tanks in space float around and "break off" from the master ship,

Using a felt pen to count the number of houses in the crowded city,

Gesturing with hand circling above the head to indicate flying space ships,

Gesturing beyond the piece of paper to indicate a house, which has not been included in the drawing, is "over a mountain", and

Using both hands to lift the piece of paper off the table to indicate how the objects and people inside the space ship [in the drawing] all "have balancing stuff," and everything has to be "balanced".

The use of fantasy, and multi-modal somatic knowing are also evident in a second research project, reported next.

### **Multi-Modality: Music and Art**

The second research project focused on children's ways of interpreting four different emotions (happy, sad, angry and tranquil) within artworks and musical excerpts. The documentation and analysis of children's responses focussed specifically on:

- Identifying those artworks and musical excerpts that children considered to be happy, sad, angry or tranquil (or combinations of these emotions), and determining the extent to which children considered these to be of specific or overlapping emotions (e.g., "this music is happy but it is also a bit tranquil"),
- Capturing children's verbal explanations and multi-modal means for communicating why the music or artwork was of one or more emotions, and analysing these interpretations in relation to descriptive (i.e., objects and events), interpretive (meaning, emotion, expression) and formal qualities (musical and visual elements, such as timbre and colour).

On a one-to-one basis, seventy-two children aged 5, 6 and 7 (12 boys and 12 girls from each age group) were shown 18 artworks and asked to listen to 8 music works. One musical excerpt was played at a time, and children were asked to look at the 18 artworks and identify those they thought "went with" the music, and to rank their selected artworks in terms of "going best", and "next going best", etc., describing why the music and the art went together for each of their selections. In most cases, children chose 2-4 artworks for each of the musical excerpts, however, in some cases, up to twelve artworks were considered to be suitable (although the children's willingness or ability to describe why often diminished after about their fourth choice and, often, no descriptions were provided, particularly with later-ranked artworks).

The musical examples were performed by professional musicians who improvised one-minute excerpts (using a solo flute or a music synthesiser) which were recorded and downloaded to CD. The artworks were selected from books and included published paintings or drawings, illustrations from children's books, and photographs of professional dancers. These artworks were colour photocopied to postcard size and laminated so that the children could touch, lift, sort or otherwise interact with the artworks without fear of damaging them.

The number of responses in which each artwork was selected in relation to each of the musical excerpts is presented in Table 1. [Titles for the art and music were created by the author, to succinctly communicate the "essence" of the images and sounds. The table has been shaded to illustrate the anticipated responses of the children (i.e., based on the interpretations of a sample of early childhood staff and students) and the number of responses that fell outside of this expectation].

Children's responses were transcribed and, currently, they are being analysed in relation to literal and metaphoric associations between visual and verbal domains, and cross-modal responses, such as focusing on one or more of the following:

- Imagery/audiation (i.e., seeing/hearing ideas not present in the artwork or music)

- Colour (e.g., blue art/blue music)
- Texture (e.g., jabbed art/jagged music)
- Gesture/movement (e.g., sense of flying both visually and aurally)
- Program (e.g., creating "story" to accompany the art and/or music)
- Temperature (e.g., warm art/warm music)
- Shade (e.g., bright or dark art/music)
- Personality (e.g., personification, such as shyness)
- Weather (e.g., rain, sun or stars and emotional associations)
- Density (e.g., thickness/compactness of image and/or sound)

Table 1. The Number of Children's Selection of Particular Emotional Qualities in Artworks in Relation to Musical Excerpts

ARTWORKS	MUSIC							
	HAPPY		ANGRY		SAD		TRANQUIL	
	Horn-pipe	German Folk	James Bond	Tympani Battle	WW II	Japanese Folk	Irish Folk	Rain-forest Comfort
I Love School	48	53	0	0	0	2	9	10
Breakfast	43	37	0	1	0	6	8	10
Skating	35	49	2	1	4	2	6	13
Cat with Bird	27	30	0	0	2	3	10	13
Dragons	0	2	37	48	4	5	1	4
Boys Fighting	1	3	33	45	7	1	1	0
Sideways V	2	3	20	26	4	2	0	1
Volcano (11)	2	3	29	21	26	7	8	4
<i>Biting Nails</i>	0	2	9	10	25	10	9	3
Crying Jesus	1	0	9	5	44	18	11	6
Crying at Desk	1	1	1	0	33	14	14	15

<b>Slumped Embrace</b>	0	2	11	2	31	17	18	9
<b>Frowning with Stick</b>	0	1	2	4	24	11	8	12
<b>Poinsettia</b>	6	7	1	3	6	11	37	18
<b>Under Tree</b>	13	10	1	2	3	15	28	18
<b>Eyes Closed</b>	1	1	0	2	6	9	16	9
<b>Rainy Streets</b>	2	3	10	4	23	10	16	9
<b>Grazing Horse</b>	3	5	3	4	19	18	24	16

The powerpoint presentation that accompanied this paper provided audible examples of the music in relation to the artworks, and examples of the language that children used to describe their choices. Of particular interest were children's responses that fell outside of what was anticipated. This can be illustrated with the example of the *Grazing Horse* (see illustration). As was expected, this artwork was most commonly classified as either tranquil or sad.

### The Artwork, *Grazing Horse*



The types of comments the children made within the sad or tranquil categories in relation to the artwork *Grazing Horse* were:

The horsey's head is down and it looks sad

There isn't any bright colours, and the music goes with it well because nothing fast is happening

It's nice to lie down there and look at the stars

The horsey's being gentle with the grass

He's standing gently

However, it was interesting that some children also classified the artwork as angry and linked it to the musical excerpt entitled *James Bond*, making comments such as:

He's killing the horse

The horse is really sad and the horse runs away but the horse feels sad. The baby horse they disappeared

It looks damaged and scared

In addition, some children classified the artwork as happy, associating it with the music entitled, "*German Folk Tune*", and commenting such as:

It looks happy. It hears like it. Sparkles

It's peaceful and calm. (hums and moves body from side to side.)

It looks like that music. There's a shooting star coming down and the horse just looks so nice in the picture.

In these angry and happy interpretations, it would appear that the children created their own "program", making a story to extend the context of the music and/or the artwork. Such examples of crossing over of visual-verbal-aural-somatic modalities (as illustrated also in the study reported earlier) are relatively common in the day-to-day encounters of young children, not only when they are engaged in art, but also during dance, dramatic play and music experiences. Through felt thought (both physical and emotional), children create and communicate meaning in symbolic ways. They come to not only *know* reality, they *create* it. Such is the nature of artistic expression, not only for children, but also for adults. Artists invent worlds in other worldly ways.

As adults, we need to suspend our conditioned, learned notions of reality so that we may enter the worlds of children. These worlds are rich with synesthesia. When we are able to understand the unique means of meaning making, interpretation and communication that are offered through the arts, we will advocate for a significant place for the arts within education, and honour the importance of arts research within this agenda.

## Conclusions

This paper illustrated examples of children using integrated information processes that bring together thought, emotion and action; thinking through imagery (and sound) and with the body. Yet, synesthesia and the use of metaphor and symbolic expression often can be suppressed in institutionalised education. This is largely due to the social and cultural dominance of *literal* language and *written* modes of expression (Kress, 2000b). Consequently, the significance of the arts should be more centrally honoured than it is at present within Australian educational systems, research priority areas and culture in general.

The arts provide important avenues for making the types of multi-modal and somatic connections that are key to deep learning and knowing. Artistic meaning making through somatic forms of knowing integrate the visual, spatial and bodily-kinaesthetic modes which may, or may not, involve the verbal mode. Instead, the arts include the worlds of still and moving images, sounds, textures, gestures, and many other symbolic forms. Consequently, much of the learning, thinking and feeling that occurs in the arts takes place non-verbally. This is because the arts involve unique forms of meaning making, knowing and communicating, through the use of discourses and a range of "texts" that can be "read" and "written". These discourses connect the body, thought, emotion and representation, using forms of knowing and communicating that cannot be replicated in other areas of the curriculum.

Consequently, a multi-modal approach to education should include a liberal definition of the term "Literacy", which encompasses the multiliteracy integration of body, mind and soul through musical, spatial, bodily-kinaesthetic and symbolic forms of artistic expression. Education should encompass a full range of expressive and communicative avenues, and use a wide range of artistic symbol systems - gesture, graphic representation, play, music, mime, and dance. If we leave these symbol systems, artistic media and modes of learning outside the realm of meaning making, interpretation and communication, the arts become relegated to minor roles in the school curriculum. They are treated as specialist activities rather than significant modes for knowing and understanding.

Thinking with the body - or somatic knowing - is key to the crossing over into each of the arts disciplines, and provides a meaningful connection to other disciplines within the curriculum. Somatic knowing opens the doors of expressive communication, and non-verbal avenues for making and communicating meaning - those very aspects of learning that futurists believe should be enhanced in our world, culture and schools today, such as critical, imaginative and creative thinking; intellectual flexibility; lifelong learning; and whole-person and trans-disciplinary education. Education should not be based solely on the use of numbers or the eloquent regurgitation of factual information using linguistic-based or information-technology-based knowledge alone. Education should provide a central role for those experiences that move us and reach the deepest part of our interior world - our human spirit - which is liberated through the integration of visual, spatial, aural and bodily-kinaesthetic ways of knowing. Through the arts, we understand multi-modality "in a new key".

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