

12-2014

A Movement Tool Kit for the Divergent and Convergent CPS Guidelines: Instruction Cards and Activity Floor Mats

Adela Vangelisti

Buffalo State University of New York, adelanumber1@yahoo.com

Advisor

Cynthia Burnett

To learn more about the International Center for Studies in Creativity and its educational programs, research, and resources, go to <http://creativity.buffalostate.edu/>.

Recommended Citation

Vangelisti, Adela, "A Movement Tool Kit for the Divergent and Convergent CPS Guidelines: Instruction Cards and Activity Floor Mats" (2014). *Creative Studies Graduate Student Master's Projects*. Paper 220.

Follow this and additional works at: <http://digitalcommons.buffalostate.edu/creativeprojects>



Part of the [Business and Corporate Communications Commons](#), [Cognitive Neuroscience Commons](#), [Curriculum and Instruction Commons](#), [Dance Commons](#), [Developmental Neuroscience Commons](#), [Educational Assessment, Evaluation, and Research Commons](#), [Educational Leadership Commons](#), [Educational Psychology Commons](#), [Entrepreneurial and Small Business Operations Commons](#), [Exercise Physiology Commons](#), [Higher Education Commons](#), [Industrial and Organizational Psychology Commons](#), [Interpersonal and Small Group Communication Commons](#), [Organizational Behavior and Theory Commons](#), [Organizational Communication Commons](#), [Other Business Commons](#), [Other Education Commons](#), [Other Physiology Commons](#), [Other Psychology Commons](#), [Performance Management Commons](#), [Psychology of Movement Commons](#), [Social](#)

Buffalo State College
State University of New York
Department of Creative Studies

A Movement Tool Kit for the Divergent and Convergent CPS Guidelines:
Instruction Cards and Activity Floor Mats

A Project in
Creative Studies

by

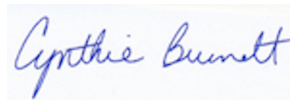
Adela Vangelisti

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science
December 2014


Dates of Approval:

12/4/14



Dr. Cynthia Burnett
Assistant Professor

12/4/14




Adela Vangelisti

ABSTRACT OF PROJECT

A Movement Tool Kit for the Divergent and Convergent CPS Guidelines:

Instruction Cards and Activity Floor Mats

Movement is as natural to humans as breathing is, and, yet, passivity starts early in schools. We are taught to sit still and in silence for long periods of time. By the time we reach adulthood and enter the workforce, we have almost forgotten our sense of embodiment. This lack of movement is counter-productive, not only to learning but to the development of creativity as well. For this project, I designed a tool to recapture the joy and playfulness of movement. Furthermore, the tool seeks to improve kinesthetic intelligence and build a bridge between movement and creativity. I've included a series of cards for creativity practitioners and activity floor mats for participants, which seem simple at first glance. However, once experienced, they have the capacity to deepen understanding of the Creative Problem Solving (CPS) divergent and convergent thinking guidelines. The work presented here is based on rich academic research in the areas of embodiment, metaphors, gestures, movement, Gaga methodology, and the science of creativity. The underpinning theories supporting each are briefly reviewed, but I have provided an extensive bibliography for the reader who craves further exploration. The development, outcomes, and key learning of this project, as well as the results of its evaluation, are also provided.



Adela Vangelisti

12/4/14

Date

DEDICATION

To Hope

When by my solitary hearth I sit,
And hateful thoughts enwrap my soul in gloom,
When no fair dreams before my 'mind's eye' flit,
And the bare heath of life presents no bloom;
Sweet Hope! ethereal balm upon my shed.
And wave thy silver pinions o'er my head

-- John Keats

This work is dedicated to my husband Tristan Vangelisti who has not only brought Hope, but meaning, joy, and inspiration to my life. T., without your unconditional love, your unwavering guidance and support, all of this could have never happened. This project is for you!

ACKNOWLEDGEMENTS

Just as teamwork can greatly improve any creative process, this endeavor is the direct result of a series of collaborations. There are so many individuals that directly or indirectly contributed to the completion of this project. First and foremost, I'd like to thank my family members and friends for their support. I am especially thankful to the faculty and staff of the International Center for Studies in Creativity at Buffalo State College, who continue to inspire and challenge me. They include, Dr. John Fitzgerald Cabra, Dr. Roger Firestien, Dr. Susan Keller-Mathers, Blair Miller, Dr. Gerard Puccio, Russell Schoen, Paul Reali, and Douglas Reid.

I owe a great deal to Dr. Cynthia Burnett, whose guidance, feedback, and steadfast encouragement throughout this project's process made it all possible. Finally, I'd like to thank the art of classical ballet that day after day sustains and nourishes my unbridled passion to dance, dance, and dance until the day I die.

TABLE OF CONTENTS

Section 1 – Background to the Project	page 1
Section 2 – Pertinent Literature and Resources	page 7
Section 3 – Process Plan	page 37
Section 4 – Outcomes	page 44
Section 5 – Key Learning’s	page 52
Section 6 – Conclusion	page 56
References	page 58
Appendices	
Appendix A – Gaga Workshop Flyer	page 61
Appendix B – The Body Now Workshop Information	page 62
Appendix C – Questionnaire Pre-Movement	page 63
Appendix D – Questionnaire Post-Movement	page 65
Appendix E – Examples of Evaluated Questionnaires	page 67

LIST OF FIGURES

Figure 1 – Facilitator’s Divergent Guidelines Cards	page 47
Figure 2 – Divergent Mat	page 48
Figure 3 – Facilitator’s Convergent Guidelines Cards	page 49
Figure 4 – Convergent Mat	page 50
Figure 5 – Dance Creative Process You Tube video link	page 54
Figure 6 – Embodying the CPS Guidelines You Tube video link	page 55

SECTION ONE: BACKGROUND TO THE PROJECT

“There is no end to the happiness your body is willing to bear”

--Mary Oliver

Purpose and Description of Project

The general purpose of this project is to unify the concepts of creating meaning, hands on experiencing, gesturing, thinking through metaphors, and the Creative Problem Solving process (that makes explicit our natural process to solve challenges) into a tool that applies the kinesthetic or sixth sense of body movement.

The specific intention is to provide the creativity practitioner with a unique, simple tool capable of translating the divergent and convergent thinking guidelines into movement tasks. Divergent thinking is a method used to generate a large number of creative ideas to tackle complex challenges. Convergent thinking organizes the previous ideas in order to find a fresh and workable solution. In addition, the tool will provide easy movement directions informed by Minton’s (2008) ten movement components (e.g., directions, size, speed/timing, shape, starting and stopping etc.) and Gaga methodology (the body and the mind acting as one) for participants to follow. The overall goal is to deepen the understanding of the CPS process as well as the science of creativity.

The brain creates meaning by integrating small pieces of information (also known as contextual learning). Patterns are formed while connecting these pieces, especially when they have personal value for learners (Minton, 2008). The more patterns formed, the more firmly the information becomes rooted in the brain. However, Fintushel (2013) noted, “The conceptual mind is just too slow, too shallow a device to be able to handle the barrage of shifting information—proprioceptive, social and environmental—to which

a performer must respond” (p.157). Therefore, incorporating movement into the creation of our learning patterns is essential.

Creative thinking and body thinking not only aid in integrating information and forming patterns, but they engage large parts of the brain. Body thinking depends on our sense of movement. Because we move on a daily basis, often on a subconscious level, we tend to take it for granted. Yet, it is only through the body that we create genuine personal meaning and make concrete sense of learned concepts and ideas (Minton, 2008). Children learn about the real world (distance, shape, weight, direction, etc.) through their physical sensations. Later on, as we mature, bodily movement activates our existing knowledge and enhances our creativity. Lobel (2014) explained, “These physical sensations constitute the basis and indeed the scaffolding for representing and understanding abstract higher concepts. Our emotions, thoughts, and behaviors are grounded in physical sensations” (p. 212).

Knowledge gained hands on remains in our memory longer because the strategies for grasping information are based on life experience (e.g., trial and error, role-playing, and creative problem solving). When movement is added to the creative problem solving process it gives the participant an alternative entry point to find answers in their own unique way. Learning through movement has many other advantages because it does not depend on age, culture, or student’s I.Q. (Minton, 2008).

Gesturing is an embodied activity that connects our experiences, emotions, and language. When we express something, especially when it is intangible, via an idea, a feeling, or a thought, we usually communicate it through gestures, in other words we say it with our bodies (Fintushel, 2013). Haft (2013) suggested, “We all speak with a

multitude of facial and bodily gestures...A good deal of what we say is conveyed by our gestures...” (p. 142). Gestures not only help speakers communicate more successfully, they also provide listeners and viewers a means of understanding more deeply both content and intention. When communicating, we modulate not only our voice pitch but also our movements to convey and integrate our inside world to the outside and vice versa.

Using gestures “reduces the cognitive load of explanation for the speaker and enhances learning for the listener” (Goldin-Meadow, 2005, p.147). Moreover, gestures allow us to express things for which we have no words. Relatively simple actions and gestures can enhance our creative thinking. In addition, when we use hand gestures we physically think of new ideas and when we combine things with our body we make remote associations (Lobel, 2014). Gesturing “...provides the scaffold to mentally project more detail structure that could otherwise be held in the mind. It is part of an interactive strategy to augmenting cognition” (Kirsh, 2010, p. 2864). When we learn through movement we gesture more and expand our physical space (Lobel, 2014).

When we think creatively we often use metaphors, which challenges us to think from various angles and perspectives, being flexible and unconventional. Indeed, to be a creative thinker we must look at issues from several sides and combine seemingly unrelated ideas. When we embody metaphors by working with our body or even imagining certain body movements we become more creative (Lobel, 2014). There is no need for devising complex movements in order to express metaphors with our body. Simply walking around a room or going outdoors allows us to think more metaphorically and thus more creatively.

A metaphor associates a concrete concept with an abstract one through an immediately comprehensible comparison. Metaphors are more than just figures of speech; they add depth and meaning to our language. In fact we actually think metaphorically. Metaphors have evolved to become universal and graphic units of meaning in our minds (Lobel, 2014).

Movement can also create meaning that is communicated nonverbally, and kinesthetic memories provide an avenue for understanding and interpreting language (Minton, 2008). Body movement is not only an innate human trait that operates at a pre-linguistic level; it is a type of visceral intelligence capable of advancing our creativity. Understanding through movement unleashes the unlimited creativity of our senses.

The Creative Problem Solving process was also explored and utilized as a framework for this project.

Rationale for Selection

As a dancer I have experienced first hand the transforming benefits of understanding the world, my community, and myself holistically. Over time, I developed positive habits both of body and mind (concentration, discipline, self-control, hard work, pride, patience, etc.), through dance. I then transferred these habits into other areas of my everyday life. Being physically attuned (or kinesthetically aware) offers a direct, focused, and tangibly dynamic way to gain powerful insights.

The movement tool explored in this project will provide an alternative way to unify the dualities of mind and body, as well as collapsing the left/right brain dichotomies that have been imposed upon us by society. Plato believed that “our true selves are trapped in this bodies of ours,” while Descartes thought, “we are spirits in a machine” (as

cited in Block & Kissell, 2001, p. 6). However, we now know that our neural connections, memory, language, and perception are integrated not only in the mind, but also in the body. The brain sends nerve impulses to our muscles to move, and, when we move, specific areas in the brain are activated creating an instantaneous mind-body link. Complex movement requires making decisions and finding solutions quickly, maintaining focus and alertness, keeping track of feelings, and remembering past experiences, all of which involves most of the brain (Minton, 2008). Moreover, because the mind and body are connected, movement allows the brain to work at its best (Lobel, 2014).

In addition, our kinesthetic sense, through movement, automatically relays proprioception (feedback) to the brain. This feedback tells us what our brain needs to know about direction, size, speed, pathways in space, tension, etc. in order to perform the most elementary tasks in every day life (Minton, 2008). An anonymous dancer explained,

Most people don't allow their bodies to think, in fact, we are trained from childhood to repress embodied knowing. We are thought that is not culturally acceptable to release embodied memories or allow the whole body to decide. We value intellect and conventionality above all else, and train ourselves to repress the experiences that our bodies wish to experience... Sometimes my brain is the primary modality of knowing and sometimes it is not. Often, for me, it has to be stimulated in some way—usually through movement. I can dream while I am awake, and I can think when I am asleep. (Block & Kissell, 2001, pp. 10-11)

Creative Problem Solving also involves two seemingly different mental processes: those of the left and right brains. We are led to believe that the left brain thinks in words using

linear, logical, and objective analysis. The right brain in turn imagines, visualizes, and thinks in metaphors. Although this simplistic understanding has some basis in reality, the two sides are connected internally and work always side-by-side – one merely dominates while the other is inhibited (Minton, 2008).

Creative thought, as well as movement, incorporates the two. Thus, I would like to offer creativity practitioners a hands-on tool that integrates both hemispheres of the brain, thereby deepening, validating, and evaluating their efforts. The movement tool creates an additional resource to promote deeper empathy with their clients, as they engage, develop, support, and nurture creativity in them. Empathy is an integral part of the creative process.

SECTION TWO: PERTINENT LITERATURE

I began the process for this project after my discussion with Dr. Burnett (my advisor) at the second Summer Institute in Buffalo, NY. Upon returning home to Los Angeles, I began to gather a variety of resources for this project. I participated in a Gaga methodology Summer intensive and a one-day Body Now workshop with Turning the Wheel organization. I also compiled a list of relevant academic articles and books. Once I completed an initial review, I selected the best resources. Following are annotations of the most pertinent sources as well as additional resources for the reader to expand on a particular subject or area of interest.

Movement Languages

Gaga. My interest in Gaga methodology arose when searching for a movement language that provided a vocabulary and conceptual framework for the investigation and understanding of movement expression (as opposed to the codified method of classical ballet that dancers usually utilize). Ohad Naharin, Gaga's creator, believed that publishing his body-mind system into a formal handbook contradicts his philosophy. He noted the following:

I give them the source. Like a virus. I infect them. ... but their interpretation ... reflects their strength, their *Groove*, their madness, their sexuality, their disabilities. And the further it grows from me, still behaving like the virus I gave them, the more interesting it becomes (as cited in Gittings, 2013, p.20).

Therefore, to further understand his technique, I had to rely on first person accounts, articles, blogs, and interviews written by Gaga dancers, workshop participants (including myself), and interviews. My own experience with Gaga movement was not

easy. For the first time, I felt lost in a highly familiar dance environment. It was obvious then that, while I had managed to fine-tune my physical body, aesthetic style, and ballet vocabulary through the years, I had also disengaged my mind when thinking about movement from a different point of view.

Gaga literature.

Gittings, D. J. (September 2013). *Building bodies with a soft spine: Gaga: Ohad Naharin's invention in practice, its roots in Feldenkrais and the vision of a pedagogy*. (Unpublished doctoral dissertation). University of Kent, Canterbury, England.

This investigation into Gaga was part of Gittings' M.A. in European Theatre. After acknowledging that most of her information on Gaga's method was pieced together from others accounts (as I previously mentioned), she gave a great description of what a Gaga class might look and feel like. Then, she argued that there is a direct connection between Feldenkrais's and Gaga's methods. Moreover, she suggested that, "Gaga's movement technique is an extension and elaboration of Feldenkrais's static exercises and that Naharin cites the Feldenkrais movement system as key in his recovering from injury" (p. 25).

In the remainder of the paper, Gittings explored the Gaga method through the lens of Feldenkrais. In 1951, Moshe Feldenkrais, a scientist, created a technique that utilized sense awareness to improve health and self-image. Similar to Gaga, Feldenkrais's technique makes no distinction between mind and body. Both systems had a comparable view on health, which includes controlling the body in order to obtain mental well being. Gittings considered Gaga to be a modernized version of Feldenkrais minus the traditional

science. She concluded her paper by speculating that Gaga most likely will be the key method and pedagogy utilized in 21st century dance.

Erwin, L. (2014). A personal journey into Ohad Naharin's Gaga technique: Discovering pedagogical applications for engaging performers. *Journal of Emerging Dance Scholarship*, 1-24.

Laura Erwin gave a different account of the Gaga experience. Her focus was on dance performance. She credited Gaga with expanding her awareness and sensitivity, as well as increasing the number of forms through which she expressed herself with her body. Erwin suggested, “My body transformed from an object to be manipulated and observed to a luxurious playground for research and enjoyment” (pp. 1-2).

Following cues and images prompted by a guide, rather than an instructor, focused class participants on a number of movement elements that included: quality, intention, effort, size, space, texture, and form. In a Gaga session, participants became creators and collaborators of original movement, often breaking habits. Knowledge and expression was developed internally and is not dependent on outside sources.

As part of her pedagogical investigation, Erwin mentioned three key ways in which Gaga developed awareness in relation to the body. The first way was through movement range, which included “micro movements” and “small places” in the body. The second, movement degree, included: body flexion, extension, and rotation. Finally, the relation between body, movement, and space offered participants new ways to go forward, backwards, and around and to explore the extremes of movement (for instance, heavy and light).

Edwin concentrated on the advantages that Gaga provided dancers during a performance. With more choices and fewer imposed limits, dancers discovered new ways to approach movement and unique references for inspiration. Gaga also offered a means by which the dancer could perform material anew regardless of its repetitive nature.

Edwin noted, “Gaga technique encourages performers to expand their physical possibilities and continually be creative and original with their bodies instead of working with entrenched ways of moving” (p. 11). Gaga encouraged dancers to always perform with authenticity and spontaneity and to be ever present and open when making movement decisions. The technique also connected performances with dancer’s personality, individualism, imagination, and enjoyment. The article concluded with the two performance tools that the author considered the biggest contribution of the Gaga technique: improvisation and dancers’ body ownership and enjoyment.

Additional sources on Gaga methodology.

Batsheva Dance Company. (2011a). *About Batsheva*. [Online]. Available from:

<http://www.batsheva.co.il/en/About.aspx>.

Batsheva Dance Company. (2011b). *Ohad Naharin*. [Online]. Available from:

<http://www.batsheva.co.il/en/Ohad.aspx>

Rose, C. (November, 2005). *A conversation with choreographer Ohad Naharin* [video file]. Retrieved from <http://www.charlierose.com/view/interview/649>

Gaga people.dancers. (2013). [Online]. Available from: <http://gagapeople.com/english/>

Gaga training and groove at Batsheva Ensemble. (n.d.). [Online video]. Available from:

<http://gagapeople.com/english/about-gaga/videos/>

Galili, D. F. (2009). Ohad Naharin. *Dance Magazine*, 83(11), 35.

- Galili, D. F. (2009). Gaga: A foreigner explores Ohad Naharin's movement language. *Dance in Israel* [Online]. Available from:
<http://www.danceinisrael.com/2009/01/gaga-a-foreigner-explores-ohad-naharins-movement-language/>
- Galili, D. F. (2009). Batsheva Dance Company: From Graham to Gaga. *Dance in Israel*. [Online]. 21 September 2009. Available from:
<http://www.danceinisrael.com/2009/09/batsheva-dance-company-from-graham-to-gaga/>
- Galili, D. F. (2009b). Going Gaga for Batsheva in America. *The Jewish Daily Forward*. [Online]. 4 March 2009. Available from:
<http://staging.boston.forward.com/articles/103567/going-gaga-for-batsheva-in-america/>
- Galili, D. F. (2012). Inside Batsheva. *Dance Magazine*. [Online]. February 2012. Available from: <http://www.dancemagazine.com/issues/February-2012/Inside-batsheva>.
- Hartley, L. (1995). *Wisdom of the body moving*. California: North Atlantic Books.
- Holmes, K. (2007). Going Gaga. *Dance Spirit*, 11(8), 136-138.
- Hoyland, V. (2009). In: Galili, D. F. (2009). Reflections on the Gaga Intensive 2009. *Dance Magazine*. [Online]. 6 August 2009. Available from:
<http://www.danceinisrael.com/2009/08/reflections-on-the-gaga-intensive-2009/>
- Katan, E. (December, 2013). *Body of knowledge: Embodied philosophy in Gaga, Ohad Naharin's movement research*. (Unpublished master's thesis). Tel Aviv University, Tel Aviv, Israel.

Mahasarinand, P. (December, 2007). Dance interview: Patravadi Mejudhon talks to Ohad Naharin. *The Nation*. Retrieved from:

<http://blog.nationmultimedia.com/danceandtheatre/2007/12/29/entry-2>

Morris, M. J. (2010). Thoughts on Batsheva and Gaga. *Dance in Columbus*. [Online].

Available from: <http://danceincolumbus.ning.com/profile/>

Naharin, O. (2010). Ohad Naharin. Biography. [Weblog]. Available from:

<http://ohadnaharin.blogspot.co.uk/2010/12/ohad-naharin-biography.html>

Namerow, E. (2008). Going Gaga for Gaga. 2 March 2008. *Dancing Perfectly Free*.

[Online]. Available from: <http://dancingperfectlyfree.com/2008/03/02/going-gaga-for-gaga/>

Ohad Naharin discusses Gaga movement. (n.d). [Online video]. Available from:

<http://gagapeople.com/english/about-gaga/videos/>

Ohad Naharin talks about Gaga and the Guggenheim Museum in New York. (n.d.)

[Online video]. *My Space*. Available from: <http://gagapeople.com/english/about-gaga/videos/> and at: http://www.myspace.com/video/vid/34635379#pm_cmp=vid_OEV_P_P

Perron, W. (2006). A conversation with Ohad. *Dance Magazine*. October 2006. [Online].

Available from: <http://www.dancemagazine.com/issues/October-2006/A-Conversation-with-Ohad>

Scopatz, S. (2011). Why going “Gaga” is one of the thinking dancer’s best alternatives.

Dance Major Journal [Online]. 73-76. Available from:

<http://dance.arts.uci.edu/sites/default/files/DMJ%202011%20Online%20Version%20Final.pdf#page=74>

Stevenson, J. (2012). Sarah Foster Sproull: Exploring Gaga technique. *Danz Quarterly: New Zealand Dance*. 28 June 2012. [Online]. Available from:

http://danz.org.nz/Magazines/DQ/July2012/gaga_technique.php

The Active Learning process. As powerful as Gaga vocabulary was, it is mostly based on abstract concepts that are open to individual interpretation. Gaga's encoded language remained exclusive to those who live and work in fields that formally use movement. Therefore, in order to make this project more accessible, I needed to find a way to integrate Gaga's vocabulary with a more concrete movement language. As Einav Katan suggested in her PhD dissertation, "[Gaga] is a self-aware method of learning...Gaga suggests terminology that understands the practice as an inquiry that is based on the embodied knowledge of dancers and shapes it further" (p. 6). For this project, I also investigated Milton's active learning process as an additional system of movement communication.

Active Learning literature.

Minton, S. C. (2008). *Using movement to teach academics: The mind and body as one entity*. Lanham, MD: Rowman & Littlefield Education.

Minton relied on her rich educational background to create a teaching tool that had the capacity to transform thought into action. Throughout the book, Milton managed to make a connection between a number of educational theories, including Gardner's "multiple intelligences" and movement. She substantiated her movement-based methodology (active learning process) through theories, research, and articles written by movement experts.

Similar to many educational theories, her active learning process developed

students from passive listeners to active participants. Milton noted, “Research shows that active learning is more effective than traditional teaching methods in providing understanding, learning problem solving, stimulating curiosity and independence, and creating positive feelings about school” (p. 1).

In other words, active learning transformed students into creative movers. In a practical sense, Milton provided eleven movement components to translate academic concepts into movement both in a concrete and abstract way. The movement components are direction, level, size, speed, duration, rhythm, quality, shape, pathway in space, body position, and starting and stopping.

She also provided a way to link the components together for those interested in creating entire dances. Milton introduced the reader to the work of Michele and Robert Root-Bernstein, which connected movement with a number of thinking skills. In their work the Root-Bernstein’s described thirteen thinking skills (observing, recognizing patterns, empathizing, body thinking, imagining, transforming, abstracting, playing, forming patterns, modeling and synthesizing), associated with highly creative individuals.

They believed that, by integrating these skills, an educational system emerges that is capable of nurturing future creative thinkers (as cited in Milton). In addition, Milton guides readers into organizing these components into a lesson. Finally, she explores in-depth the mind-body connection from a series of viewpoints with a focus on learning.

Additional sources on the Active Learning Process.

Braxton, J. M., Milem, J. F., & Sullivan, A. S. (2000). The influence of active learning on the college student departure process. *Journal of Higher Education, 71*(5), 569.
doi: 10.2307/2649260

Crawford, A., Saul, W., Mathews, S. R., & Makinster, J. (2005). *Teaching and learning strategies for the thinking classroom*. International Debate Education Association.

Gorman, M. E., Plucker, J. A., & Callahan, C. M. (March, 1998). Turning students into inventors: Active learning modules for secondary students. *Phi Delta Kappan* 79(7).

Harmin, M., & Toth. (2006). *Inspiring active learning: A complete handbook for today's teachers*. Association for Supervision and Curriculum Development.

Joel, A. M., & Harold, I. M. (2003). *Active learning in secondary and college science classrooms: A working model for helping the learner to learn*. Mahwah, NJ: Lawrence Erlbaum Associates.

Kraiger, K. (2002). *Creating, implementing, and managing effective training and development: State-Of-The-Art lessons for practice*. San Francisco, CA: Jossey-Bass.

Preston-Dunlop, V. (1998). *Rudolf Laban: An extraordinary life*. London, England: Dance Books.

Root-Bernstein, R.S., & Root-Bernstein M. (1999). *Sparks of genius: The thirteen thinking tools of the world's most creative people*. Boston, MA: Houghton Mifflin.

Embodiment

When we communicate with others what is understood is not necessarily grasped on a cognitive level. Understanding is also emotional, subliminal, unconscious, concealed, and very often after the fact. Thus, embodying helps us more fully speak and listen. Indeed, the body and the brain exist for each other. The sensations from the skin

and body—touch, temperature, pain, etc. are the mind's true foundation. The concept of body intelligence was the basis of this project and the key for finding the elements to create the deeper learning I hoped to achieve with my tool.

Embodiment literature.

Block, B., & Kissell, J. L. (2001). The dance: Essence of embodiment. *Theoretical Medicine*, (22), 5-15.

Movement, and in particular dance, contributes a great deal to the investigation of embodiment. Betty Block and Judith Lee Kissell looked at this phenomenon from both the philosophical and dance perspectives. Embodiment is important philosophically because it allows us to dig deeper into our mental understanding. Embodiment is essential in dance because it provides insights into what it means to live in the body as wholly human.

In the West, we understand ourselves as fragmented: body, mind, and soul, and we tend to localize knowledge in the mind. However, Block and Kissell believed that the experience of how individuals are in the world is integrated throughout the body. Dance captures in an all-encompassing multisensory way the meaning and symbolism of life itself.

Rudolf Laban, a Hungarian dance theorist and choreographer, spent his life analyzing everyday movement and understanding the relationships between an individual's occupation, religion, and the structure of dance. He also made the connection between movement and thinking. In the philosophical arena, dance and movement provide great meaning at a personal/private or social/public level. Through ritualized dances, many cultures celebrate change and growth and express deep-rooted feelings.

Fintushel, E. (2013). Thinking with your skin: Paradoxical ideas in physical theater. In M. Katz (Ed.), *Moving ideas: Multimodality and embodied learning in communities and schools* (pp. 157-169). New York, NY: Peter Lang Publishing.

Eliot Fintushel introduced the reader to the world of physical theater in which thinking is done directly through the body. In that world, dance improvisation is called “physicalizing at random,” which is the way performers express something intangible through the use of posture and gesture. In addition, physicalizing aims at reducing or eliminating inhibitions set by traditional convention.

As children, we use not only our bodies, but also the bodies of others to communicate. As adults, Fintushel suggested, “We want to evoke the natural freedom of childhood but with mature circumspection as well as mature intellect and motor skills” (p. 59). To recapture some of that freedom, he recommended a series of physical theatre exercises. In “Emotion in Body Parts” a body part is associated with a feeling and performed that way, for instance, a happy elbow or a jealous shoulder. Fintushel encouraged participants to take risks and push the associations to the limit. “Prop Rounds” involves showing with the body the usual use of an object and eventually embodying the object.

A pair teams up in the “Sculpture Garden” exercise: one becomes the artist and the other one the clay. After the sculpture is finished, the clay must freeze in that position for others to investigate. The sculpture embodies a vision or idea in the clay’s body. “Polaroid” follows some of the same ideas, except this time an imaginary camera that can take pictures at every angle and through walls and time does so of a group of participants. The film is made out of people’s bodies and the picture thinks with their

bodies as a group. “Stop and Start Together” utilizes the body intelligence of a group to walk and stop simultaneously. The actions and responsibilities of a leader and follower are investigated in “Mirror Game.” Also done in pairs, one leads while the other follows along to move in unison.

Fintushel then described a movement classification system invented by Rudolf Laban in the 1920s. Laban explained movement by combining the elements of weight, shape, and speed. Each of these elements had two principles: heavy or light, straight or curved, and fast or slow. Out of the combination of these elements and principles eight types of movement were possible. The movement ranged from “punching” (heavy, straight, and fast) to floating (light, curved, and slow). Voice and sound are other ways to use the body, even if they are only imagined.

Fintushel further recommended a number of games this time using the sense of sound. In “Name Shapes” participants embody their voices as they voice their body’s movement. Other participants are able to recall the movement because the gesture has activated mirror neurons. The same scientific principle is applied when we are empathetic. In “Voice Puppet” someone else’s voice controls the movement. While in “Atmosphere Puppet” a group of puppets respond to atmospheric sounds.

In “Stealing Faces” two participants are placed in an imaginary situation. One participant acts out a gamut of emotions while the other mirrors them. This exercise is aimed at cutting through the superficial process of thinking to reach a deeper visceral one. “Neutral Circle” and “Neutral Mask” are exercises focused at developing awareness and body reading. As each participant steps forward to say his or her name, the observers try to correlate feelings with movements. The mask complicates things since no emotion

is now observable. Through these exercises, the participants become acquainted with their own bodies in an objective way and become better observers both of feelings and body movement.

The thread that runs through all of these experiences is what Fintushel called “hollow flexibility.” Even though he acknowledged that no clear definition exists, he explained it as “a type of selfless surrender” (p. 157), “to play consciously” (p.159), “to yield to a partner’s touch” (p.161), to be empty yet receptive (p.166), and to have “an aliveness and sensitivity to body language” (p.169).

Grauert, R. (2002). The common aesthetic. In A. Mertz (Ed.), *The body can speak: Essays on creative movement education with emphasis on dance and drama* (pp. 15-17). Carbondale: Southern Illinois University Press.

In chapter 4, the author Ruth Grauert (2002) described Bearnstow, an art camp in central Maine that offers intensive classes in music, the visual arts, dance, poetry, and theatre. She utilized the camp example as a way to communicate what she believes about the value of art. Even though she recognized that each discipline works differently, they all share elements common in our universe: time (duration and reiteration), space (volume and linear projection), and energy. Moreover, she recognized that each of these elements on a continuum of variations and contradictions are shaped by the same modifiers: hard and soft, bright and dull, heavy and light, strong and weak, loud and quiet, fast and slow, large and small, etc.

Grauert then suggested that art is what connects us to our humanity, “First, we learn to tap the source of art (ourselves), and then with discriminative application of the elements, we refine what we regurgitate. The essential skill is what we teach ourselves as

we proceed from tapping to tapping” (p.16). For instance, she explained that dance can be as simple as “sticking out your tongue, thumbing your nose, stamping your foot, bending your back, turning your head” (p.16). Grauert also compared art to an adventure complete with motion, sound, color, and words and described the earth as home base to be experienced with all the senses. In addition, she viewed art as the way we communicate not only with others, but ourselves.

Additional sources on embodiment.

- Dimondstein, G. (1971). *Children dance in the classroom*. New York, NY: Macmillan.
- Feldenkrais, M. (1972). *Awareness through movement*. New York, NY: Harper and Row.
- Fraser, D. L. (1991). *Playdancing: Discovering and developing creativity in young children*. Pennington, NJ: Princeton Book.
- Hawkins, A. M. (1983). *Creating through dance*. Princeton, NJ: Princeton Book.
- H'Doubler, M. (1998). *Dance: A creative art experience*. Madison, WI: University of Wisconsin Press.
- Highwater, J. (1978). *Dance: Rituals of experience*. New York, NY: A & W.
- Iacoboni, M. (2008). *Mirroring people: The science of empathy and how we connect with others*. New York: Picador, Farrar, Straus & Giroux.
- Jones, F. P. (1976). *Body awareness in action: A study of the Alexander technique*. New York, NY: Schocken Books.
- Katz, M. (Ed.). (2013). *Moving ideas: Multimodality and embodied learning in communities and schools*. New York, NY: Peter Lang Publishing.

- Kleinberg-Levin, D. M. (1985). *The body's recollection of being: Phenomenological psychology and the deconstruction of nihilism*. London, England: Routledge & Kegan Paul.
- Lakeoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to Western thought*. New York, NY: Basic Books.
- Lamb, W., & Watson, E. (1987). *Body code: The meaning in movement*. Princeton, NJ: Princeton Book.
- Lao, Tzu. <http://www.wussu.com/laotzu/laotzu> 1. html
- Merleau-Ponty, M. (1964). *Signs*. Evanston, IL: Northwestern University Press.
- Nagrin, D. (1994). *Dance and the specific image (improvisation)*. Pittsburgh, PA: University of Pittsburgh Press.
- Randall, J. (2013). A trio: Combining language, literacy, and movement in preschool and kindergarten community-based dance lessons. In M. Katz (Ed.), *Moving ideas: Multimodality and embodied learning in communities and schools* (pp. 157-169). New York, NY: Peter Lang Publishing.
- Sorrell, W. (1992). *The dance has many faces*. Chicago, IL: A Capella Books.
- Spicker, S.F., & Engelhardt, T. H., Jr. (Eds.). (1975). *Mind and brain: The embodied person*. Boston, MA: D. Reidel.
- Spolin, V. (1963). *Improvisation for the theatre: A handbook of teaching and directing techniques*. Evanston, IL: Northwestern University Press.
- Sweigrad, L. E. (1988). *Human movement potential (its Ideokinetic facilitation)*. Lanham, MD: University Press of America.
- Von Laban, R. (1998). *The mastery of movement*. Plymouth, England: Northcott House.

Wigman, M. (1966). *The language of dance* (W. Sorrell. Trans.). Middletown, CT: Wesleyan University Press.

Zaner, R. (1981). *The concept of self*. Athens, Ohio: Ohio University Press.

Metaphors

When people are faced with an abstract problem, or even a solution, they turn to metaphors to concretize and conceptualize them. This phenomenon is especially useful when a familiar metaphor fits with the problem or solution at hand. To take it a step further, researchers have designed experiments to show how individuals can use everyday movement in the same manner. These findings were especially valuable to me in discovering new routes by which to embody the Creative Problem Solving guidelines for divergent and convergent thinking and translate them into movement for this project.

Metaphors literature.

Lobel, T. (2014). Turning on lights outside the box: Embodying metaphors. In *Sensation: The new science of physical intelligence*. New York, NY: Atria Books.

In this chapter, Thalma Lobel investigated the association between metaphors and behavior through the embodying enactment of their meaning. In other words, people explain metaphors by acting them out, and Lobel explored how this influences our emotions and everyday performance. Throughout history, many cultures have created rituals and superstitions out of the embodiment of thoughts and wishes.

Metaphors have also been used to transform emotions into tangible objects that can potentially be more easily controlled. To examine further, a group of researchers conducted a series of experiments. One divided students into two groups and asked each group to write about a regrettable decision. Then, one group was asked to place their

writing in an envelope before handing it in while the second group just turned it in. The results showed that those students who used the envelope felt less negative about the decision after the experiment.

A similar second study asked students to write about something they strongly desired, but did not get, and describe how they felt using four emotions: sadness, disappointment, anxiety, and dissatisfaction. Half of the students sealed their thoughts in envelopes while the other half did not. The results showed that, at least temporarily, embodying thoughts might be helpful and cathartic.

Embodying metaphors with simple movements and gestures can also nurture creative thinking and make us more creative. Another set of experiments were conducted, this time embodying creative metaphors like “On the One Hand and On the Other Hand,” “Think Outside the Box,” and “Putting Two and Two Together.” The results on all three showed that movement aids in idea generation, originality, flexibility, decision-making, and problem solving. Moreover, the experiments showed that not only physical embodiment, but also mental embodiments trigger creativity. The implications of these results expand to many areas – personal, educational, environmental, and vocational.

Lobel believed that bodily and sensory motor experiences can also help with grasping abstract concepts, especially for children. Four more experiments were conducted, this time investigating the use of a light bulb, which since Archimedes’ (Greek mathematician) time has been a symbol and metaphor for *aha* moments and the *eureka* effect. All participants who were exposed to light did better in tasks that required insight and creativity.

Lobel suggested, “The results confirm that what enhances creativity is the exposure to the bare illuminated lightbulb, which is metaphorically related to innovation and insight and symbolizes discovery” (p.207). Other results showed that participants being exposed to an Apple Computer logo vs. IBM made more creative choices. Thus symbols alone have the potential to make us more creative.

Additional sources on metaphors.

Fitzsimons, G. M., Chartrand, T. L., & Fitzsimons, G. J. (2008). Automatic effects of brand exposure on motivated behavior: How Apple makes you "think differently". *Journal of Consumer Research*, 35(1), 12-16.

Gurman, E. B. (1989). Travel abroad: A way to increase creativity? *Educational Research Quarterly*, 13(3), 12-16.

Heracleous, L., & Jacobs, C. D. (2008). Crafting strategy: The role of embodied metaphors. *Long Range Planning*, 41(3), 309-325. doi:10.1016/j.lrp.2008.02.011

Heracleous, L., & Jacobs, C. D. (2008). Understanding organizations through embodied metaphors. *Organization Studies*, 29(1), 45-78. doi:10.1177/0170840607086637

Kupers, W. M. (2013). Embodied transformative metaphors and narrative in organizational life-world of change. *Journal of Organizational Change Management*, 26(3), 494-528. Doi: 10.1108/09534811311328551.

Li, X., Wei, L., & Soman, D. (2010). Sealing the emotions genie: The effects of physical enclosure on psychological closure. *Psychological Science*, 21(8), 1047-1050. doi: 10.1177/0956797610376653.

- Leung, A. K., Kim, S., Polman, E., Ong, L. S., Qiu, L., Goncalo, J. A., & Sanchez-Burks, J. (2012). Embodied metaphors and creative "acts". *Psychological Science, 23*(5), 502-509. doi: 10.1177/0956797611429801.
- Mednick, S. (1962). The associative basis of the creative process. *Psychological Review, 69*(3), 220-232. doi: 10.1037/h0048850.
- Ratey, J. J., & Hagerman, E. (2008). *Spark: The revolutionary new science of exercise and the brain*. New York: Little, Brown.
- Slepian, M. L., Weisbuch, M., Rutchick, A. M., Newman, L. S., & Ambady, N. (2010). Shedding light on insight: Priming bright ideas. *Journal of Experimental Social Psychology, 46*(4), 696-700. doi: 10.1016/j.jesp.2010.03.009.

Gestures

Unfortunately, not all individuals have the opportunity, freedom, or skills to express themselves and communicate with others through movement. However, we all use gestures (facial expressions, hand figuring, etc.) while speaking or explaining ourselves. Research has shown that gestures are utilized as a sort of prop, which frees some cognitive space in our minds to either understand more deeply the challenge at hand or attend to other tasks. Dancers utilize gestures (in dance they are called marking) to visualize and memorize choreography while partially embodying movement. Also, marking is a tool used to conserve energy and prevent injury. My investigation into the science of gesturing, beyond my own knowledge of dance marking, contributed greatly to my exploration of simple movement for this project.

Gestures literature.

Haft, N. (2013). 36 Jewish Gestures. In M. Katz (Ed.), *Moving ideas: Multimodality and embodied learning in communities and schools* (pp. 139-156). New York, NY: Peter Lang Publishing.

Nina Haft is a professor, performer and choreographer. Her investigative focus is movement and identity. In this chapter she explored what hands, postures, facial expressions, and movement say about us. She was particularly interested in how our body language and gestures communicate stereotypes. Haft defined a gesture as “a set of non-verbal codes broadcasting who we are in the world” (p. 40). We usually internalize these gestures and utilize them unconsciously.

Gestures are a kind of movement signature, unique to every individual and yet carrying embodied information about gender, age, power, and culture learned along the way. In this particular chapter Haft investigated, “how much of my movement could be reduced to code and just how far I could push the meaning behind such movements” with “36 Jewish Gestures,” a solo performance work (p.140). At her request, dancers deconstructed movement into single elements performed by individual body parts to convey character, motivation, and intention. However, gestures are not only utilized on stage, but in everyday life.

Gestures are embodied practices that link our feelings and language. What we communicate with the body is a result of the material, places, habits, and people we meet along the way. In the remainder of the chapter, Haft described in detail her performance for “36 Jewish Gestures,” as well as what inspired her characters.

Kirsh, D. (2010). Thinking with the body (S. Ohlsson & R. Catrambone, Eds.).

In Proceedings of the 23rd Annual Conference of the Cognitive Science

Society (pp. 2864-2869). Austin, TX: Cognitive Science Society. Retrieved from <http://adrenaline.ucsd.edu/kirsh/Articles/Interaction/thinkingwithbody.pdf>

In this article David Kirsh, a cognitive science professor at the University of California, San Diego, explored the phenomenon of physical thinking via qualitative, ethnographic methods. Through extensive interviews and video footage, Kirsh followed the creative process of choreographer Wayne McGregor as he produced a new work for the London-based dance company Random Dance.

Kirsh's specific focus was on the technique known as "marking." He notes, "When dancers mark a phrase, they use their body's movement and form as a *representational vehicle*. They do not recreate the full dance phrase they normally perform; instead, they create a simplified or abstracted version—a model" (p. 2864). Kirsh investigated how dancers utilize marking as a thinking vehicle. He then, compared marking to gesturing, because both have the potential to operate as a substitute for linguistic codes.

Marking can make physical movement measureable, but more importantly it benefits cognition in some ways and actually exceeds it in others. Kirsh believed that marking anchors projection to a target, augmenting and clarifying thought. Marking unifies inner and external elements of thought. Also, marking primes the neural system, enhancing imagination by making it more real and detailed. Marking as a way of body thinking offers a deeper and more complete understanding than thought alone.

Additional sources on gestures.

Challis, B; Brodbeck, D. (1992). Level of processing affects priming in word fragment completion. *Journal of Experimental Psychology: Learning, Memory, and*

- Cognition*. 18(3), 595-607.
- Clark, A. (2008). *Supersizing the Mind*. Oxford, UK: Oxford University Press.
- Coffman, D. (1990). Effects of mental practice, physical practice, and knowledge of results on piano performance. *Journal of Research in Music Education*, 38(3), 187-196.
- Collins, A., Brown, J. S., Holum, A. (1991). Cognitive apprenticeship: Making thinking visible. *American Educator*, 6, 38-46.
- Efron, D. (1941/1972). *Gesture, race, and culture: A tentative study of some of the spatial-temporal and "linguistic" aspects of the gestural behavior of Eastern Jews and Southern Italians in New York City, living under similar as well as different environmental conditions*. The Hague, Netherlands: Mouton.
- Fodor, Jerry A. (1975). *The language of thought*. Cambridge, Massachusetts: Harvard University Press.
- Goldin-Meadow, S. & Wagner, S. M. (2005). How our hands help us learn. *Trends in Cognitive Sciences*, 9, 234-241.
- Hutchins, E. (2005). Material anchors for conceptual blends. *Journal of Pragmatics*, 37(10), 1555-1577.
- Kirsh, D. (2009a). Problem Solving and Situated Cognition. In Phillip Robbins & M. Aydede (Eds.) *The Cambridge handbook of situated cognition*. Cambridge, England: CUP.
- Kirsh, D, et al. (2009c). Choreographic methods for creating novel, high quality dance. Proceedings, DESFORM 5th International Workshop on Design & Semantics & Form.

- Koch I., Keller P., Prinz W. (2004). The Ideomotor approach to action control: Implications for skilled performance. *Int. Journal of Sport and Exercise Psychology*, 2, 362-375.
- Krakauer, J.W., & Shadmehr, R. (2006). Consolidation of motor memory. *Trends in Neurosciences*, 29, 58-64.
- Lederman, S. J.; Klatzky, R.; Collins, A; Wardell, J. (1987). Exploring environments by hand or foot: Time-based heuristics for encoding distance in movement space. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 13(4), 606-614.
- McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. Chicago, IL: University of Chicago Press.
- McNeill, D. & Duncan, S.D. (2000). Growth points in thinking-for-speaking. In D. McNeill (Ed.), *Language and Gesture*, pp. 141-161. Cambridge, MA: Cambridge University Press.
- Muntanyola, D, Kirsh, D. (2010). Marking as physical thinking: A cognitive ethnography of dance. Donosti.
- Noland, C., & Ness, S.A. (Eds.) (2008). *Migrations of gesture*. Minneapolis: University of Minnesota Press.
- Pylyshyn, Z. (1986) *Computation & cognition: Toward foundation for cognitive science*. Cambridge, MA: MIT Press.
- Sklar, D. (2008). Remembering kinesthesia: An inquiry into embodied cultural knowledge. In Noland, C., & Ness, S.A. (Eds.) (2008). *Migrations of gesture* (pp.85-111). Minneapolis: University of Minnesota Press.

- Smith, M C., et al., (1983). The relationship between contextual facilitation and depth of processing. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 9(4), 697-712.
- Von Laban, R. (1975). *Principles of dance and movement notation*. Princeton, NJ: Princeton Book Company.
- Weiss, M. (2002). *The chosen body*. Stanford, CA: Stanford University Press.
- Williams, R.F. (2006). Using ethnography to study instruction. Proceedings from 7th International Conference of the Learning Sciences. Mahwah, NJ: Lawrence Erlbaum.
- Wittgenstein, L (1951). *Philosophical Investigations*. Oxford, England: Basil Blackwell.
- Young, K. (2002). The memory of the flesh: The family body in somatic psychology. *Body & Society*, 8(3), 25-47.

Creative Problem Solving

From all of the investigations conducted for this project, none were more critical than deepening my exploration of the Creative Problem Solving process.

The Creative Problem Solving (CPS) process and model was originated in the 1950s out of the combined efforts of Alex Osborn (an advertising executive), Sidney Parnes (an academic researcher), and Ruth Noller (a mathematician) (Miller, Vehar, Firestien, Thurber, & Nielsen, 2011). The process, as well as its latest iteration the Thinking Skills Model (Puccio, Murdock, & Mance, 2007), utilizes our natural creative thinking capabilities and intuition, transforming them into deliberate skill to solve challenges (Puccio, Mance, Barbero, Switalski, & Reali, 2011). Similar to body

movement, CPS is a powerful tool that grasps complex challenges and transforms them into concrete actions.

Both CPS and body movement require internalizing, practicing, and nurturing. Understanding the difference between divergent and convergent thinking is the key to effectively applying the Creative Problem Solving (CPS) model. The difference between simply solving problems and doing so creatively is understanding these two types of thinking modes (Miller et al., 2011).

Divergence frees our thinking and stretches our mind to allow for the numerous possibilities available for tackling challenges. It also ensures that we take a look at ideas through a prism of perspectives and leave what is familiar behind. To facilitate this generative phase, four interrelated guidelines are available. The first “Defer Judgment” postpones our positive or negative evaluations and our decision-making behavior to a later time. The second one “Strive for Quantity” allows our mind to travel into unfamiliar territory and pushes our imagination to endless possibilities. When we purposely take risks with our thinking and unleash our playfulness, we are “Seeking Wild Ideas and Novelty,” the third guideline of divergent thinking. The last guideline refers to the previously mentioned ability of our brain to make meaning by forming patterns. “Building on Ideas or Making Connections” benefits from our minds’ capacity to create from many inspirational sources (Miller *et al.*, 2011, p. 22).

Alternatively, convergence organizes and makes sense of our thinking. Convergent thinking also has a series of guidelines that simplify this evaluative phase. Our instincts are often to criticize and make speedy decisions. But when we discipline ourselves to first see and acknowledge merits, we employ the first guideline of

convergent thinking: “Apply Affirmative Judgment.” “Be Deliberate and Stay Focused” reminds us to keep our prejudices and assumptions in check and to give each option a fair chance. If we are to develop the best possible solutions, we need to objectively and carefully evaluate and filter all options before discarding them. “Check Your Objectives” reminds us to stay on track, to go back to our original goals, and to not lose sight of our purpose. When we have spent valuable time and energy generating options, narrowing them to just a few can be heartbreaking. However, “Improving Ideas” and “Keeping Novelty Alive” are two guidelines that protect the solutions that are workable and promising. Even the best of our ideas can be perfected.

When we bravely trim, tailor, and rework ideas we ensure their success. When we hone, strengthen, and refine solutions we minimize and overcome any risks involved in making them actionable (Miller *et al.*, 2011, p. 23). Both divergent and convergent thinking are necessary for creative outcomes, and finding the balance between the two is essential.

Many brilliant minds have engaged in developing strategies and ways to maximize the power of CPS. Among them are tools to effectively diverge and converge. Some make use of our senses. For instance when diverging, Force Connections is a brainstorming tool that utilizes our visual sense to connect challenges with completely unrelated images (Miller *et al.*, 2011, p. 30). When converging, Targeting is a tool that allows us to visually understand the gap that exists between an ideal and the reality (Miller *et al.*, 2011, p. 57). However, none of these strategies focus on utilizing the power of movement to enhance creative thinking.

Furthermore, my new findings (ex. Hoeye’s work) regarding how creativity is, by

definition, physical and pragmatic, because it utilizes thinking in a unique way that closely resembles action, were key to formulating a strong approach to my project.

Creative Problem Solving process literature.

Miller, B., Vehar, J. R., Firestein, R. L., Thurber, S., & Nielsen, D. (2011). A look at creativity. In *Creativity unbound: An introduction to creative process* (pp. 11-24). (5th Ed.). Evanston, IL: FourSight, LLC.

In this chapter Miller et al. offered a snapshot of some of the basic ideas in the science of creativity. Among them was the bedrock belief that we are all creative, two of the many creativity definitions (Creativity=Novelty that's useful) and Mel Rhodes "Four P's" (Person, Product, Process, and Press). They also referred to the two kinds of thinking (Divergent and Convergent) that together hold the key to producing new ideas and the guidelines to using them more successfully.

Finally, they listed 32 well-known traits of creative people including: adaptable, tolerant of ambiguity, flexible, fluent, imaginative, curious, and risk taker.

Puccio, G. J., Mance, M., Barbero Switalski, L., & Reali, P. D. (2012). Divergent and convergent thinking: The heart of creative thinking. In *Creativity rising: Creative thinking and creative problem solving in the 21st century* (pp. 45-49). Buffalo, NY: International Center for Studies in Creativity Press.

In this chapter the authors expanded a previously used driving metaphor to explain creative thinking. Similar to a car that has many parts but only two basic functions, the creative problem solving process has a number of stages and steps but only two vital thinking processes. Divergent thinking, or the process of generating many options for a challenge, resembles the accelerator of the car. The gas pedal allows the car

to move quickly, and, by not stopping or slowing down, it travels further. The same is true of our thinking.

On the other hand, convergent thinking is similar to a car's breaks. The breaks slow the car's speed and ensure that we don't miss our destination. Puccio et al. explained, "With convergent thinking; we apply our judgment to determine which of the options we generated are most appealing" (p.45). A car wouldn't function and would eventually stop working all together if we applied the accelerator and break simultaneously. In the same way, our thinking gets overwhelmed and disturbed when we try to combine divergent and convergent thinking at the same time. To be not only a proficient driver but a great one, we need to learn when and how to accelerate and break.

Creative thinking acts the same way, it trains our minds to balance and move smoothly between divergent and convergent thinking when faced with a complex problem or decision. The authors used another metaphor, this time of a digital camera to explain further the need for separating the two forms of thinking. Taking photos digitally has eliminated the limits of using film. Today, we can take as many photos as we like and as our memory card can hold. We do not need to stop and check them along the way. It is only when we are ready to download them to a computer or printing them that we take the time to select and improve them.

Puccio, G. J., Mance, M., Barbero Switalski, L., & Reali, P. D. (2012). Principles for divergent & convergent thinking: Becoming a better creative thinker. In *Creativity rising: Creative thinking and creative problem solving in the 21st century* (pp. 51-66). Buffalo, NY: International Center for Studies in Creativity Press.

In this chapter, Puccio et al. explained that by following a number of guidelines or rules we can effectively and efficiently separate divergent and convergent thinking. When diverging, four guidelines allow our minds to remain open: defer judgment, go for quantity, make connections, and seek novelty. When converging, four other guidelines transform ideas into solutions: apply affirmative judgment, keep novelty alive, stay focus, and check your objectives. In addition, the wild card guideline of incubation reminds us that sometimes we need time to reflect for our best ideas to surface.

Along with these guidelines, the chapter offered the reader two key thinking tools: brainstorming and hits. Brainstorming is highly effective as long as we engage the right group of people, ask clear questions, and follow the divergent guidelines. Hit is a convergent tool that allows us to identify quickly the best and most workable options.

Additional sources on Creative Problem Solving.

Black, R. A. (1995). *Broken crayons: Break your crayons and draw outside the lines.*

Dubuque, IA: Kendall/Hunt Pub.

Hoeye, M. (2002). *Adventures in real space: An alternate mode of thinking and problem solving.* In A. Mertz (Ed.), *The body can speak: Essays on creative movement education with emphasis on dance and drama* (pp. 65-70). Carbondale: Southern Illinois University Press.

Johansson, F. (2004). *The Medici effect: Breakthrough insights at the intersection of ideas, concepts, and cultures.* Boston, MA: Harvard Business School Press.

Osborn, A. F. (1963). *Applied imagination*, Revised Ed. New York, NY: Scribner

Parnes, S. J. (1961). Effects of extended effort in creative problem solving. *Journal of Experimental Psychology*, 52, 117-122.

- Parnes, S. J. (1997). *Optimize the magic of your mind*. Buffalo, NY: Bearly Limited.
- Puccio, G. J., Mance, M., & Murdock, M. C. (2011). *Creative leadership: Skills that drive change* (2nd Ed.). Thousand Oaks, CA: SAGE
- Smith, S. M., & Dodds, R. A. (1999). Incubation. In M.A. Runco & S. R. Pritzker (Eds.). *Encyclopedia of creativity, Volume 1, A-H* (pp. 39-43), San Diego: CA: Academic Press.
- Torrance, E. P. (1999). *Making the creative leap beyond*. Buffalo, NY: Creative Education Foundation.

SECTION THREE: PROCESS PLAN

The enduring journey of this project began long before I sat in a classroom at Buffalo State College. I was then searching for ways to close the gap between my artistic background as a dancer and nurturing creativity in others. The short-term process began during my second Summer Institute in Buffalo while I was discussing with Dr. Burnett how to converge the numerous new and exciting avenues that I explored as a student in the International Center for Studies in Creativity. The true dilemma lied in selecting a single project that could accurately represent the life-changing program I had just experienced. This project is the result of many hours of brainstorming, feedback, incubation, and investigation, which allowed me to rediscover the dance lexicon with a plethora of new knowledge and fresh perspectives.

However empowering, my love of dance and the fire sparked by the science of creativity I still required some type of scaffolding in which to build this project. The Creative Problem Solving process provided a reliable system to deepen my level of learning. The CPS process consists of four basic steps: Clarification, Ideation, Development, and Implementation. The benefit of gaining expertise in this process is the ability to assess and then utilize it in a non-linear way, repeating steps and tools when necessary.

After assessing the requirements for this project, I began the project process non-linearly at the Developing Stage of the CPS process. I looked to strengthen my solution (designing a movement tool) and incorporated Incubation (reflection) periods when necessary. At the Developing stage, I analyzed the project with the POINT tool (what is positive, opportunistic, issues about my solution) that prompted the need for additional

brainstorming (new thinking). Brainstorming, which I conducted at the Ideation Stage produced a number of unique ideas, but also the need for different resources. I refined those resources at the Clarification Stage (gathering data, literature, prototyping etc.). Prepared with all this new knowledge I was able to move smoothly into the Implementation Stage that concretized the final product of this project.

Developing Stage

Creating a movement tool for the CPS process that can be utilized by everyone required first a unifying language. I knew I had a promising idea that needed a workable solution. I was fortunate that an intensive workshop on Ohad Naharin's Gaga methodology was being offered at the Loyola Marymount University campus, here in Los Angeles, California. Three instructors, who not only learned the technique directly from Naharin but were also members of his company Batsheva in Israel, facilitated the workshop. I attended the workshop for seven hours daily from June 28th to July 3rd, 2014, in search of a solution for the convergent plan part of my project (Refer to Appendix A).

Much to my delight and fortune, I found that Gaga is based on the assumption that the body and the mind act as one in every aspect of human understanding. Gaga methodology believes that with every move we are conducting embodied research. Some of the language is used to draw attention to a specific part of the body, an action, a certain dynamic, or one of the body's relationships with space.

Gaga sessions consist of one and one half hours of non-stop movement. However, unlike a traditional dance class, no direct instruction, no evaluation, and no mirrors are involved. The facilitators simply suggest prompts for movement, and the results are as unique and as personal as the participants. The work is done in layers that

build from simple to complex. Some of the tasks involved are done through deep introspection – sense and explore the skin behind your neck (or another body part).

Others use the imagination – move as if your flesh has melted and you are just bones. A Gaga session is a true multisensory experience that involves the power of metaphors; sometimes you are asked to smell the room with your elbow or make your movement juicy with a sweet taste in the mouth. The work involves an abundance of new thinking.

Incubation: The Wildcard Principle

A vital aspect of the Creative Problem Solving process that is not always discussed is Incubation. When we reach a saturation point in our thinking we might need a period of time to reflect or incubate. This mental and physical break is not only helpful, but also natural. Incubation pauses our explicit, conscious, and systematic creative process and takes advantage of our minds and body's automatic mode. Incubation frees part of the mind to find answers unconsciously. This principle is called “wildcard,” because it is unpredictable, doesn't fit into any particular stage of the process, and is personal to the thinker. It is during periods of Incubation that I often make real connections and find solutions to challenges. Unfortunately for me, this activity usually takes place in the middle of the night. In order to catch these fleeting insights, I depend on a notebook and pen. I call these episodes my Einstein Hours!

Ideation Stage

As I brainstormed, I utilized the ten movement components developed by Minton in 2008 (directions, level, size, speed/timing, duration, rhythm, quality, shape, pathway,

position, and starting/stopping), as my alphabet, the Gaga multisensory methodology as a language, and movement games as compass.

Additionally, the physical theater games that Eliot Fintushel (2013) described in his essay *Thinking with Your Skin* encouraged me to explore popular games (Twister, Cranium Hullabaloo, etc.) and to attend the Body Now workshop organized by Turning the Wheel organization. Turning the Wheel is a non-profit organization that uses the power of movement to foster communities, build leaders, and share the joy of self-expression. The organization narrows the gap by including participants of all ages, economic situations, genders, ethnic backgrounds and challenges (Refer to Appendix B). The Forced Connections CPS Ideational tool allowed me to integrate all this diverse elements into one single workable project.

Clarification Stage

My next step involved expanding the scope of my research to find the scholarly resources to support my case. I investigated both established and cutting edge academic papers focusing on embodied cognition, the use of metaphors and gestures, multisensory learning, the unification of right and left brain, etc. Among the papers was a Gaga dissertation completed by a student in Germany with whom I had personal communication while she awaited publication. Throughout, I utilized the 5W's (What, When, Where, Why, Who) and 1H (How) to gather as much data as possible, to fully understand as well as clarify the challenge, and to inform my selections.

Writing the concept paper to this project also played a role in clarifying further which aspects of the CPS process to use for my movement tool. I made the decision to focus on the guidelines for divergent and convergent thinking. These two kinds of

thinking are governed by nine guidelines, which are partly responsible for the success of the CPS process. In order to translate the guidelines into movement, I needed a wider repertoire of words.

Each word evolved through several rounds of study with paper and digital dictionaries and thesauri, resulting in a list of definitions, synonyms, antonyms, related words, historical information, and other uses. The list was then compared and contrasted to Milton's movement components (previously mentioned in this paper) until a logical pairing was deducted. Writing the different chapters of this project clarified my activities further.

Implementation Stage

The next step was to create a graphic representation on a small scale. I mapped and sketched the movement trajectory on paper using markers and stickers, and laid out the facilitator cards on the computer. This informal prototype exercise and the many that followed confirmed how complex the project concept was to communicate and translate. It exposed many issues that needed to be fully resolved before I could bring to fruition the actual tangible product.

However, prototyping also allowed for some hands-on thinking, which sped up the process. I simplified the original sets of movement floor pads into two main mats, one for each type of thinking (divergent and convergent). I also decided to color code the facilitator instruction cards to match the participant's steps and symbols on the mats. I finalized the wording and played with color combinations for the cards. I researched ballroom dancing books to find figures and patterns on which to base the different

movements. For future project production, I met with a graphic designer and printer to discuss pricing and delivery timing.

PROJECT TIMELINE

CPS Stage	Activity	# Hrs
Development	1. Gaga Intensive	35
Development	2. The Body Now Workshop with Turning The Wheel	5
Incubation	Einstein Hour	∞
Ideation	Brainstorm for ways to integrate: a. Minton's movement components b. Gaga's language c. The Body Now+ children games. d. Ballroom dance figures	50+
Clarification	1. Research, acquisition, and analysis of literature and resources. 2. Completion of Concept Paper. 3. Compilation of guideline's word list 4. Write Project Chapters 1+2+3 5. Write Project Chapters 4+5+6	100+
Clarification	1. Editing of all chapters 2. Formatting Project	40+
Incubation	EH	∞
Implementation	Prototyping and Meeting with graphic designer	75

Implementation	Printing pricing and delivery deadlines	3
Implementation	Video Production 1. Dance Creative Process 2. Embodying Guidelines	40
Implementation	Evaluations	2
		Total= 350

SECTION FOUR: OUTCOMES

This project's tangible product is a series of downloadable digital files for a Creative Problem Solving movement tool kit for practitioners. Included in the kit are the files for two card sets and two floor mats. Each of the eleven double-sided cards has, on one side, a single divergent or convergent guideline and, on the flip side, the instructions that a facilitator will deliver to participants.

The initial divergent card is solid green because it invokes the GO quality of this thinking style. The subsequent divergent cards have colors that correspond to certain activities in the mat with a green border for identification ease. The initial convergent card is solid red, as a signifier for STOP, the quality of this thinking style (even though the movement tasks continues). The remainder of the cards has red borders so the particular set is kept together without difficulty.

Digital files are also provided for two floor mats, so that facilitators can separate the movement tasks into stations: one for diverging movement tasks and the other for converging movement tasks. The advantage of offering digital files instead of physical products is flexibility. The files allow facilitators to customize the kit according to their needs. The files are provided at a suggested size; however, all materials in the kit can be adjusted in size, proportion, and printing materials, as well as according to budget. The files will have a unique per download link with an expiration date and a limited number of downloads accordingly.

The mats are designed to map the simple steps participants follow as they embody the CPS divergent and convergent guidelines. Each mat has a series of steps represented by a left and a right shoe in a color that corresponds to one facilitator card. The right shoe is always a solid color and is indicated by a letter R inside the shoe and the left is a color outline with a letter L inside. The shoes are also numbered in a particular sequence. The arrows in the mats indicate direction as the participants make their way through the

various figures. The figures are arranged in order of progression and refer to the pathway/pattern movement component.

Some steps have special configurations. On the divergent mat, blue dots and yellow highlighting indicate them. On the convergent mat there are suggested by red broken arrows, grey arrows, and pink dots (See Figures 2 & 4 below).

All the figures were adapted from Betty White's (1957) social dancing book *Dancing Made Easy*. Each figure represents a small portion of a ballroom dance. The zigzag figure represents foxtrot, the circle – merengue, both squares – rumba, and the crisscross – mambo.

The instructions on the green divergent card direct participants through all the figures on the mat, from the starting to finish line. This movement is similar to the divergent CPS's stage, in which all ideas that come to mind are welcomed and acknowledged. The yellow “defer judgment” divergent card guides them to alternate between heels and toes as they step to slow down the movement. Furthermore, there is no positive or negative inherent connotation to moving this way (a toe or a heel) it simply engages different body parts. The same guideline in the CPS process suggests that we delay complementing or criticizing any idea generated.

The “go for quantity” blue divergent card asks participants to tap their toes three times on each dotted step in the mat before the next one is taken. The repeating action extends the effort and duration of the movement. Thus, it allows participants more time to practice and perfect. The same determination is expected when individuals ideate – the more ideas produced, the greater the chance of generating high quality ones. The “seek wild ideas” divergent guideline requires that we stretch our thinking to find unusual solutions. Likewise, the direction on the orange card allows participants to step at random so they might find unique step patterns. Finally, the pink “build on ideas” card leads the participants to link all the figures on the mat to create a more complete one. The

CPS divergent guideline also asks us to build on, draw inspiration from, improve, and combine ideas so that better ones are found (See Figures 1 & 2 below).

On the convergent mat, the first red card instructs participants to follow the same figures as they did on the divergent mat, but this time along a red dotted line, which narrows them, limiting the space of movement. This stage in the CPS process also filters, selects, synthesizes, and organizes the number of ideas generated in the divergent stage. The grey card corresponding to the “check objectives” guideline reverses all the figures and places the participants at the starting point, reminding them not to forget the original path. When we practice the “check objectives” convergent guideline, we also keep the original goal in mind as we move through the process.

The tangerine card directs participants to walk the path again, but this time stepping with the right foot first (in ballroom dancing when leading you always step with the left foot first). The majority of individuals are right-handed which means they are stronger on that side. Similarly, the CPS “improve ideas” guideline reminds us that even the most promising ideas need to be honed and strengthened.

The navy blue card corresponds to the “consider novelty” guideline. When participants balance on one foot they have to pause briefly (for two counts), pay attention (not to fall), and take a chance (to go on). In the CPS process this convergent guideline is utilized to slow down, reflect, and focus in order to not overlook a unique opportunity and assess risk. A hot pink circle invites participants to hop on one foot to keep an upbeat pace; just as the “be affirmative” CPS guideline suggests that we look at the positive side of any idea first. The lime-yellow card directs participants to take a step forward and then take half a step backwards. This instruction provides an instant in which participants can decide if they would like to move to the next step. In the “be deliberate” CPS convergent guideline, we take the time to develop a plan so we don’t make any arbitrary decisions (See Figures 3 & 4 bellow).

Figure 1. Facilitator's Divergent Cards



Figure 2. Divergent Mat

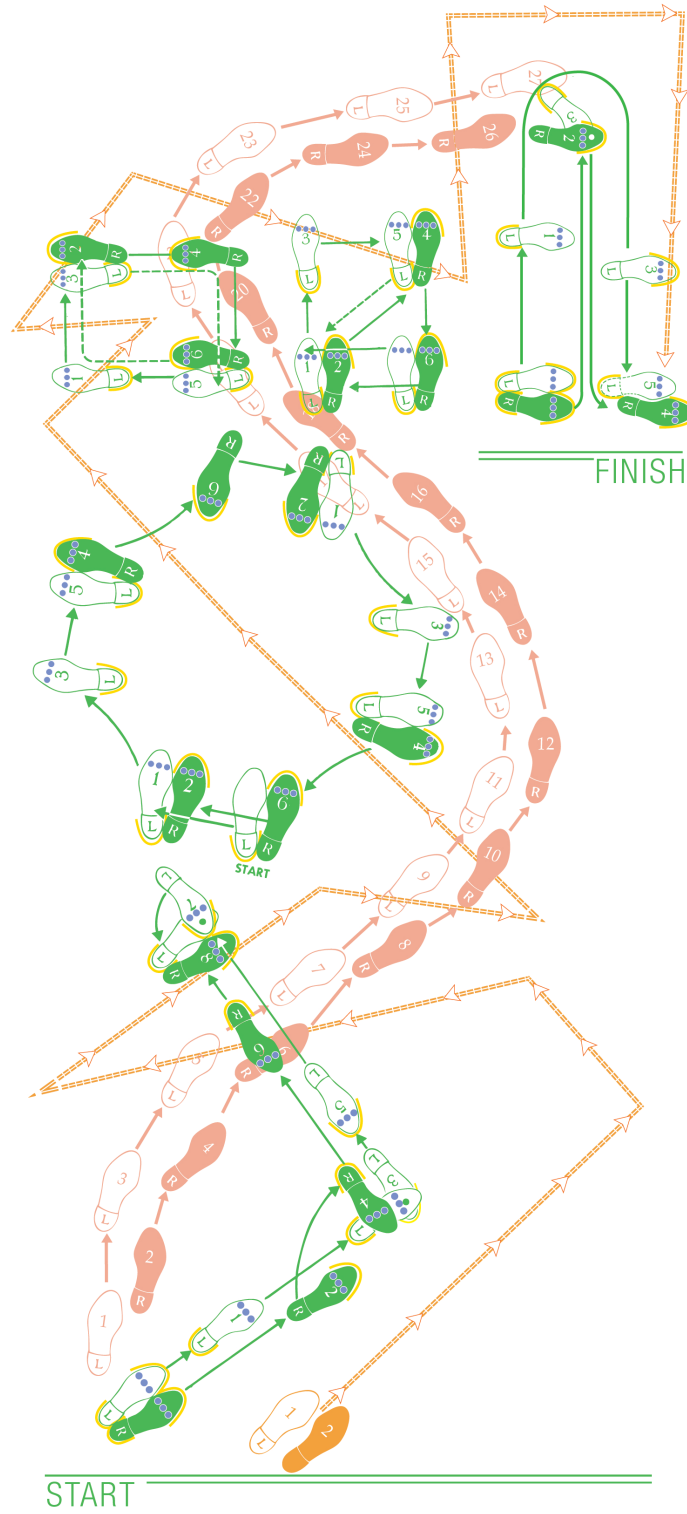
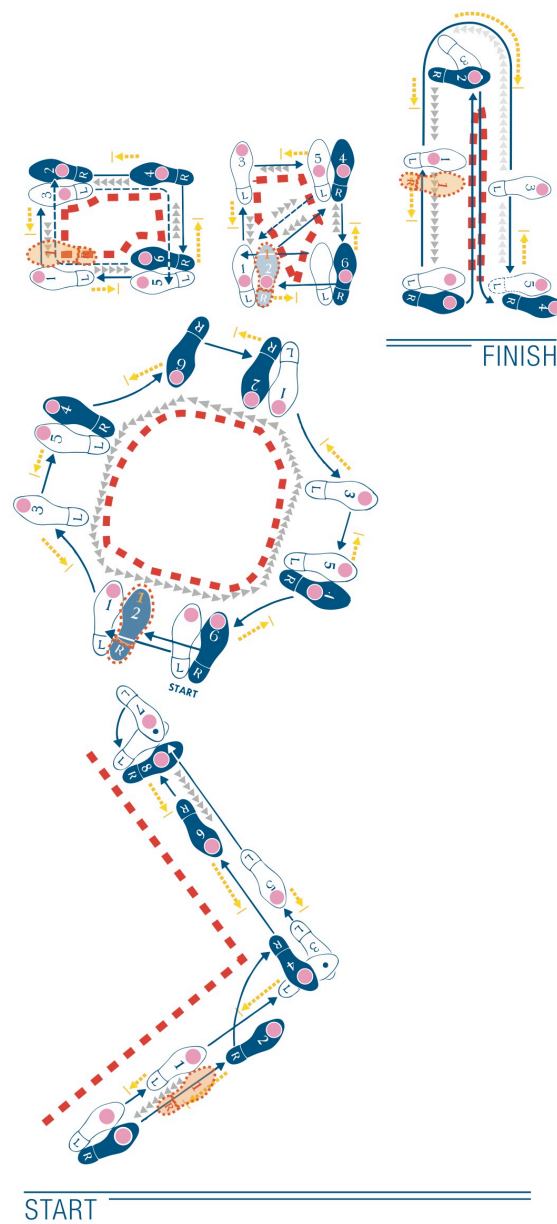


Figure 3. Facilitator's Convergent Cards



Figure 4. Convergent Mat



Evaluation

To assess the effectiveness of this project's movement tool, I designed a pre- and post-use multiple-choice questionnaire to measure the change (if any) in retention of the CPS divergent and convergent guidelines. The pre-use questionnaire will assess how

much participants remember about the guidelines after a facilitator has verbally explained them. Next, participants will move individually through both of the divergent and convergent mats embodying the guidelines. The post-use questionnaire will then evaluate participants' knowledge after completion of the movement tasks. The participants will have fifteen minutes to complete each questionnaire (Refer to Appendices C, D, & E).

SECTION FIVE: KEY LEARNINGS

When I created the movement tool kit for this project, I wanted to benefit both the creativity practitioner as well as the participant and enrich their experiences. However, I was surprised by how much personal growth I myself experienced. Exploring Creative Problem Solving through a different lens deepened my understanding, especially as I utilized the process throughout the project. For the first time, I experienced the process in a non-linear way and utilized the tools more than once. Strategizing how to best introduce, communicate, and facilitate this tool increased my empathy as a consultant. In so doing, I can now competently become a future contributor to its growth.

I also learned a great deal about movement and dance, shattering many of my preconceived ideas. As a professional ballet dancer, teachers usually challenge me to fine tune my technique, and choreographers give me the opportunity to develop my artistry further. However, I spend most of my time observing, imitating, reproducing, replicating, and performing precisely what I am given. The ownership, decision-making processes, and responsibility usually fall to a teacher or choreographer. The process is similar to a convergent approach.

This project gave me the unique opportunity to make my own decisions in terms of concept, style, content and structure, as well as the freedom to diverge (improvise) through movement. Thus, I found a way to integrate my dance experience with my creativity education and to change leadership skills. This project connected my dance and academic worlds.

Finding the right movements for participants to embody divergent and convergent guidelines was possible because I discovered the underpinning theories supporting each.

For instance, dissecting movement into components followed the Active Learning educational strategy. However, it was also the result of pushing myself out of my comfort zone as a mover. In the Gaga workshop I attended, I danced for the first time without mirrors, concrete instructions, or music – relying purely on instinct and intuition.

The research I conducted to complete the project challenged me to improve my analytic, evaluative, critical, and organizational skills. I was daunted by the amount of data gathered and feared that it was perhaps too large to be manageable in this context. However, I now realize that embracing the scope of this project made me a better writer and forced me to more effectively manage time, while expanding my knowledge in all aspects of kinesthetic intelligence as it applies to the field of creativity.

I drew from my background as a magazine fashion editor to design the prototype of the cards and mats, bringing a personal sense of joy and play to the project. Presenting complex information in its simplest form is demanding, but essential for the practitioner. Design boils down to three elements: composition, components, and concept. Composition is how things are combined and arranged. The components of a design are the visual elements used within the design. Concept initiates the design by providing the abstract and intangible ingredients. These three elements provided a framework for my creative process while designing. Creating the cards and mats gave me the opportunity to use my imagination while I learned more about color, font, and layout.

Balancing and harmonizing the hues between the red and green borders and the colors in the cards was stimulating. Finding new palettes for the steps in the mat was interesting. Fonts for this project needed to make an impact, be easy to identify, be legible, and communicate the message. I utilized large point size, bright colors, hard-to-

ignore shapes, and a modern font to accomplish it. In other words I made the fonts dance boldly on the card. To be successful, the mats needed to be clearly interpreted by everyone, including people who are not dancers. Thus, I followed the figures in White's (1957) aforementioned book, which aims at making self-instruction practical.

Layout is the marriage between words, pictures, and, in the case of this project, movement. Layout uses both the right and left sides of the brain. This marriage can only be effective through extensive trial and error. I searched for words that had similar meanings to the ones in the CPS divergent and convergent guidelines, but could also be translated into movement. The layout of the mats and the instructions on the cards are the result of this investigation. Even though I decided to turn the actual project into digital files, collaborating with a graphic designer once this project was finalized and meeting with a printer to discuss prices were great learning experiences as well.

I also created two videos for this project. The first was filmed at a dance rehearsal while I marked (gesturing for dancers) a small portion of a new piece along with the choreographer. The piece entitled "Crossing" is a metaphor for a time in life when we must choose a path or converge. The video does not focus on me dancing; instead it shows my process for internalizing prescribed movement and sensory information given by the choreographer. Once embodied, the movement becomes second nature, and I am then able to free my mind and body. Later, when I actually perform the entire dance (not shown in the video), I am open to inject my own expression and style.

Figure 5. Dance Creative Process Video

<http://www.youtube.com/watch?v=udjIK1wRWiE>

In the second video, I also utilized many of my creativity skills and kinesiology knowledge, but in a different way. Instead of printing the divergent and convergent mats (which was very costly), I created a prototype. I used butcher paper and drew the map of my own feet with color markers. As I followed the map, I realized that it would be difficult for the video's viewer to follow the movement. So, I matched the colors in the facilitator's card, the mat figures, and my socks. Actually moving through the figures, before testing it with others, gave me a better sense of the tool's effectiveness and additional ideas for improving later versions.

After the tool's evaluation with participants, I had a clearer picture about the next refinements to be made. Among them are: a more precise way to connect the guidelines to the facilitator's movement tasks descriptions, as well as developing a way for the participants to follow the order and direction of the figures without having to look down. I also realized the benefit of allowing participants a few test runs cognitively and physically until they are ready to perform the task on the mats with the addition of music.

Figure 6. Embodying the CPS Guidelines Video <http://youtu.be/0vSoegpp5ZI>

SECTION SIX: CONCLUSIONS

Drawing upon research and my own experience, I have suggested in this project that the body has a mind of its own and that movement is one of human beings' most vital and adaptive traits. Understanding how the brain, body, and senses work together, we can establish and strengthen our neural connections and nurture them to perform better. In addition, I proposed that creativity is a form of problem solving that differs from traditional analytic thinking, and, thus, it benefits greatly from innovative tools that are multimodal.

The Creative Problem Solving process is used to solve complex challenges and to find unique opportunities. It is not, however, meant for problems that have been solved many times before, have obvious and formulaic solutions, have one right answer, or are externally motivated. By developing a simple movement tool for one aspect of CPS (the divergent and convergent guidelines), I have put forward but one response and offered a single framework that can contribute towards a broader future approach to teaching, facilitating, and learning the CPS process.

Throughout this project, I have attempted to strengthen the interrelationship between creativity and movement in order to improve the way that practitioners serve clients. Of course the tool is meant to be experienced, and my wish is that the reader begins by doing, moving, and practicing. I will utilize the findings from this project as a baseline against which I can measure and improve the experience. I plan to make use of the evaluation and feedback obtained from this opportunity to add movement tools to other areas of the Creative Problem Solving process, as well as expanding and creating additional tools.

As part of a short-term goal, I hope to patent this divergent and convergent guidelines movement tool and to make it available to other creativity practitioners and students to purchase. I will research existing patents to make sure that this product does not already exist or belong to someone else. The U.S. Patent and Trademark office offers

an online database. I will then submit an application. The waiting period for review and approval is eighteen months.

In addition, I plan to develop workshops to introduce the movement tool to the creativity community and to deliver them at creativity conferences. Among the opportunities in 2015 are CEE (Creativity Expert Exchange) and CPSI (The Creative Problem Solving Institute) both in Buffalo, NY.

My hope is that this project helps to clarify aspects about the often-misunderstood art of dance, shatters the myth that learning through movement is childish, awkward, and unnecessary, and brings awareness about the least understood sense (sixth/kinesthetic) to a wider audience.

References

- Block, B., & Kissell, J. L. (2001). The dance: Essence of embodiment. *Theoretical Medicine*, (22), 5-15.
- Erwin, L. (2014). A personal journey into Ohad Naharin's Gaga technique: Discovering pedagogical applications for engaging performers. *Journal of Emerging Dance Scholarship*, 1-24.
- Fintushel, E. (2013). Thinking with your skin: Paradoxical ideas in physical theater. In M. Katz (Ed.), *Moving ideas: Multimodality and embodied learning in communities and schools* (pp. 157-169). New York, NY: Peter Lang Publishing.
- Grauert, R. (2002). The common aesthetic. In A. Mertz (Ed.), *The body can speak: Essays on creative movement education with emphasis on dance and drama* (pp. 15-17). Carbondale: Southern Illinois University Press.
- Gittings, D. J. (September 2013). *Building bodies with a soft spine: Gaga: Ohad Naharin's invention in practice, its roots in Feldenkrais and the vision of a pedagogy*. (Unpublished doctoral dissertation). University of Kent, Canterbury, England.
- Goldin-Meadow, S. & Wagner, S. M. (2005). How our hands help us learn. *Trends in Cognitive Sciences*, 9, 234-241.
- Haft, N. (2013). 36 Jewish gestures. In M. Katz (Ed.), *Moving ideas: Multimodality and embodied learning in communities and schools* (pp. 139-156). New York, NY: Peter Lang Publishing.
- Hoeye, M. (2002). Adventures in real space: An alternate mode of thinking and problem solving. In A. Mertz (Ed.), *The body can speak: Essays on creative movement education with emphasis on dance and drama* (pp. 65-70). Carbondale: Southern Illinois University Press.

- Kirsh, D. (2010). Thinking with the body (S. Ohlsson & R. Catrambone, Eds.). In *Proceedings of the 23rd Annual Conference of the Cognitive Science Society* (pp. 2864-2869). Austin, TX: Cognitive Science Society. Retrieved from <http://adrenaline.ucsd.edu/kirsh/Articles/Interaction/thinkingwithbody.pdf>
- Lobel, T. (2014). Turning on lights outside the box: Embodying metaphors. In *Sensation: The new science of physical intelligence*. New York, NY: Atria Books.
- Miller, B., Vehar, J. R., Firestein, R. L., Thurber, S., & Nielsen, D. (2011). A look at creativity. In *Creativity unbound: An introduction to creative process* (pp. 11-24). (5th Ed.). Evanston, IL: FourSight, LLC.
- Minton, S. C. (2008). *Using movement to teach academics: The mind and body as one entity*. Lanham, MD: Rowman & Littlefield Education.
- Puccio, G. J., Mance, M., Barbero Switalski, L., & Reali, P. D. (2012). Divergent and convergent thinking: The heart of creative thinking. In *Creativity rising: Creative thinking and creative problem solving in the 21st century* (pp. 45-49). Buffalo, NY: ICSC Press, International Center for Studies in Creativity.
- Puccio, G. J., Mance, M., Barbero Switalski, L., & Reali, P. D. (2012). Principles for divergent & convergent thinking: Becoming a better creative thinker. In *Creativity rising: Creative thinking and creative problem solving in the 21st century* (pp. 51-66). Buffalo, NY: ICSC Press, International Center for Studies in Creativity.
- Puccio, G. J., Mance, M., & Murdock, M. C. (2011). *Creative leadership: Skills that drive change* (2nd Ed.). Thousand Oaks, CA: SAGE.
- White, B. (1957). *Dancing made easy*. Philadelphia: David McKay.

SECTION SEVEN: APPENDICES

Appendix A. Flyer for Gaga Workshop

Gaga Intensive **LOS ANGELES**

June 28- July 3rd

10-5pm

Gaga, Ohad Repertory, Methodology

Danielle Agami, Tom Weinberger, Shahar Binyamini

Address: Loyola Marymount University (LMU)
1 LMU Drive
Los Angeles, CA, 90045

Studio: 229

The studio is located in the Burns Fine Arts Center (BUR) in the Hogan Hall (HGN) building on the second level.

Parking/Campus Map:

Attached is a campus map for your reference.

FREE street parking is located on 80th street and you can enter the campus from the main entrance on Loyola Blvd. (This is not the "Main Entrance")

Housing:

Housing options

- www.airbnb.com
- www.yelp.com

LMU is located in *Playa Vista*. Nearby areas are:

- *Venice, Culver City, and Santa Monica.*
- Search hotels/hostels/airbnb in these areas and you will have a great selection.

Transportation:

Nearby freeways are the 405 & the 10

Public transportation information:

- <http://www.metro.net>

**for all public transportation planning provide ample time & refer to the trip planner on the website.*

**If you have a Smart Phone, download the application "Go Metro Los Angeles Version 2" It is free!*

Car Rental:

1. Rent-A-Wreck of West L.A.
12333 W. Pico Blvd.
Los Angeles, CA 90064
800-995-0994

wrentwreck@aol.com

**they offer free pick-up & drop-off from LAX*

2. Midway Car Rental
6151 W Century Blvd
Los Angeles, CA 90045
866-717-6802

www.midwaycarrental.com

**free shuttle to & from LAX*

Appendix B. Information for The Body Now Workshop

DANCERS, MENTORS & TEACHERS:

Are you interested in learning how to translate what you know about the creativity and expressiveness of the body to teach others how to access it in gentle and playful way?
Do you have an interest in using your art to grow community, nurture leaders and bring people back to their bodies?

Do you desire tools to move with groups as a means to teach, create or connect?

Join us for The Body Now, a workshop for mentors and teachers, to learn and partake in movement improvisation and games that bring out the joy, confidence and teamwork in people of all ages and abilities.

It will be an enriching day with Alana Shaw, an inspiring and empowering guide and Founder of the national non profit dance/theater company, Turning the Wheel.

Alana offers over 30 years of experience teaching in 25 cities throughout the US and Canada.
Live musical accompaniment by Jesse Manno.

Sat, Oct 18th, 1:30 - 4:30 pm. \$40. (\$30. for DRC members)

Blackbird Dance Studio
305 N. Fairfax
Los Angeles, CA 90036.

Appendix C. Multiple Choice Questionnaires for Movement Tool

Pre-Movement

1. When we are ready to Converge it means that we are:
 - a. Ready to make decisions
 - b. Ready to produce twice as many good ideas
 - c. Ready to improve ideas
 - d. Ready to trim, tailor, and rework ideas

2. Seeking Wild and Unusual Ideas means:
 - a. Stretching our thinking
 - b. Invigorating weak ideas
 - c. Letting one idea spur other
 - d. Being guided by our personal prejudices and assumptions

3. Being Deliberate means:
 - a. Making snap decisions and harsh judgments
 - b. Giving every option a fair chance
 - c. Every idea is a workable solution
 - d. Not to evaluate ideas

4. When we remember our original goal:
 - a. We are Diverging
 - b. We are Converging
 - c. We are brave
 - d. We are checking our objectives

5. In order to Defer Judgment we have to:
 - a. Evaluate ideas as we generate them
 - b. Not evaluate ideas as you generate them
 - c. Disregard the first idea that comes to our mind
 - d. Evaluate ideas later

6. In order to Be Affirmative we need to:
 - a. Utilize our “no way” reflex
 - b. Look for what we don’t want
 - c. Discipline our positive thinking
 - d. Freewheel

7. When Striving for Quantity we are:
 - a. Doing the usual to solve challenges
 - b. Not pushing for new options
 - c. Generating as many ideas as possible
 - d. Honing and strengthening ideas

8. When we are Combining and Improving ideas we are:
 - a. Diverging
 - b. Building on other ideas
 - c. Watching out for “sparkling ideas”
 - d. Looking for what we want

9. When we are ready to Diverge it means that we are:
 - a. Ready to Judge
 - b. Striving for quantity
 - c. Deferring Judgment
 - d. Checking our Objectives

10. Diverging and Converging
 - a. Are never used together
 - b. Complement each other
 - c. Make us less creative
 - d. Divide our ideas

Answer Key:

1. a, c, and d
2. a
3. b
4. b and d
5. b and d
6. c
7. c
8. a and b
9. b and c
10. b

Appendix D. Multiple Choice Questionnaires for Movement Tool

Post-Movement

1. Building on Ideas means:
 - a. Spanning Boundaries
 - b. Not allowing for other sources of stimulation
 - c. Combining things into their previous form
 - d. Drawing inspiration from one thing when working on another

2. When we Diverge we:
 - a. Approach challenges with fresh eyes
 - b. Choose among options that are too limited
 - c. Enjoy the resolution that comes with converging
 - d. Push ourselves to the point of not knowing

3. Convergence and Divergence
 - a. Are separated in order that our thinking be more efficient and effective
 - b. Require that we know how to move back and forward between them
 - c. Are natural mental processes we use in everyday life
 - d. Happen separately but harmoniously

4. To Be Affirmative means to:
 - a. Approach evaluation with a constructive attitude
 - b. Run with our typical thinking
 - c. Work to overcome flaws
 - d. Being close-minded

5. When we Converge we:
 - a. Select among the options
 - b. Our minds move quickly
 - c. We are more adventurous
 - d. Make order and sense

6. Consider Novelty
 - a. Protects and nurtures ideas and options
 - b. Puts us back into our comfort zone
 - c. Allow us take some risk

- d. Defend the quest for a creative outcome
7. Defer Judgment means that:
- a. We decide immediately
 - b. We place a stranglehold in our ability to think in original ways
 - c. We suspend skepticism
 - d. We praise
8. To Be Deliberate means:
- a. Being persistent
 - b. Apply judgment objectively
 - c. Work towards a defined purpose
 - d. Keeping track
9. When we Strive for Quantity:
- a. We encourage habitual thinking patterns
 - b. We are fluent thinkers
 - c. We gain insight into what is important and effective
 - d. We make meaningful connections
10. When we Seek Wild and Unusual Ideas, we:
- a. Become tense
 - b. Sustain the status quo
 - c. Make a mental leap
 - d. Encourage Imagination

Answer Key:

- 1. a and d
- 2. a and d
- 3. a, b, c, and d
- 4. a and c
- 5. a and d
- 6. a, c, and d
- 7. c
- 8. a, b, c and d
- 9. b
- 10. c and d

Appendix E. Evaluation Results

Participant A. Tim Barlen Percent of Increase After Movement Tool= 30.71%

1	2
Kreative Problem Solving Divergent/Convergent Guidelines Questionnaire	
Name <u>Tim Barlen</u> Date <u>11/28/19</u>	
Directions: Please place a check mark/s by the correct answer/s after the verbal portion of the presentation is completed	
1. When we are ready to Converge it means that we are: <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> Ready to make decision b. <input type="checkbox"/> Ready to produce twice as many good ideas c. <input checked="" type="checkbox"/> Ready to improve ideas d. <input type="checkbox"/> Ready to trim, tailor, and rework ideas 	
2. Seeking Wild and Unusual Ideas means: <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> Stretching our thinking b. <input type="checkbox"/> Investigating weak ideas c. <input type="checkbox"/> Letting one idea spur other d. <input type="checkbox"/> Being guided by our personal prejudices and assumptions 	
3. Being Deliberate means: <ul style="list-style-type: none"> a. <input type="checkbox"/> Making snap decisions and harsh judgments b. <input type="checkbox"/> Giving every option a fair chance c. <input checked="" type="checkbox"/> Every idea is a workable solution d. <input type="checkbox"/> Not to evaluate ideas 	
4. When we remember our original goal: <ul style="list-style-type: none"> a. <input type="checkbox"/> We are Diverging b. <input checked="" type="checkbox"/> We are Converging c. <input type="checkbox"/> We are brave d. <input type="checkbox"/> We are checking our objectives 	
5. In order to Defer Judgment we have to: <ul style="list-style-type: none"> a. <input type="checkbox"/> Evaluate ideas as we generate them b. <input checked="" type="checkbox"/> Not evaluate ideas as you generate them c. <input type="checkbox"/> Disregard the first idea that comes to our mind d. <input checked="" type="checkbox"/> Evaluate ideas later 	
6. In order to Be Affirmative we need to: <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> Utilize our "no way" reflex b. <input type="checkbox"/> Look for what we don't want c. <input checked="" type="checkbox"/> Discipline our positive thinking d. <input checked="" type="checkbox"/> Freewheel 	
7. When Striving for Quantity we are: <ul style="list-style-type: none"> a. <input type="checkbox"/> Doing the usual to solve challenges b. <input type="checkbox"/> Not pushing for new options c. <input checked="" type="checkbox"/> Generating as many ideas as possible d. <input type="checkbox"/> Honing and strengthening ideas 	
8. When we are Combining and Improving ideas we are: <ul style="list-style-type: none"> a. <input type="checkbox"/> Diverging b. <input checked="" type="checkbox"/> Building on other ideas c. <input type="checkbox"/> Watching out for "sparkling ideas" d. <input checked="" type="checkbox"/> Looking for what we want 	
9. When we are ready to Diverge it means that we are: <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> Ready to Judge b. <input type="checkbox"/> Striving for quantity c. <input type="checkbox"/> Deferring judgment d. <input checked="" type="checkbox"/> Checking our Objectives 	
10. The Diverging and Converging Guidelines <ul style="list-style-type: none"> a. <input type="checkbox"/> Are never used together b. <input type="checkbox"/> Complement each other c. <input type="checkbox"/> Make us less creative d. <input checked="" type="checkbox"/> Divide our ideas 	
Total Possible Correct Answers= 16 Total Correct Answers= 5 Total Incorrect Answers= 11 Percent= 30.25%	

<p style="text-align: center;">1</p> <p style="text-align: center;">Creative Problem Solving Divergent/Convergent Guidelines Questionnaire</p> <p>Name <u>Tom Bricelj</u> Date <u>11/28/19</u></p> <p>Directions: Please place a check mark by the correct answer/s after you have completed the movement portion on both mats</p> <p>1. Building on Ideas means:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> Spanning boundaries Not allowing for other sources of stimulation Combining things into their previous form <input checked="" type="checkbox"/> Drawing inspiration from one thing when working on another <p>2. When we Diverge we:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> Approach challenges with fresh eyes Choose among options that are too limited Enjoy the resolution that comes with converging <input checked="" type="checkbox"/> Push ourselves to the point of not knowing <p>3. Convergence and Divergence Guidelines:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> Are separated in order that our thinking be more efficient and effective Require that we know how to move back and forward between them <input checked="" type="checkbox"/> Are natural mental processes we use in everyday life <input checked="" type="checkbox"/> Happen separately but harmoniously <p>4. To Be Affirmative means to:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> Approach evaluation with a constructive attitude Run with our typical thinking <input checked="" type="checkbox"/> Work to overcome flaws Being close-minded <p>5. When we Converge we:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> Select among the options Our minds move quickly We are more adventurous <input checked="" type="checkbox"/> Make order and sense 	<p style="text-align: center;">2</p> <p>6. The Consider Novelty Guidelines:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> Protects and nurtures ideas and options Push us back into our comfort zone <input checked="" type="checkbox"/> Allow us to take some risk <input checked="" type="checkbox"/> Defend the quest for a creative outcome <p>7. To Defer Judgment means that:</p> <ol style="list-style-type: none"> We decide immediately We place a stranglehold in our ability to think in original ways <input checked="" type="checkbox"/> We suspend skepticism <input checked="" type="checkbox"/> We praise <p>8. To Be Deliberate means:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> Being persistent Apply judgment objectively <input checked="" type="checkbox"/> Work towards a defined purpose <input checked="" type="checkbox"/> Keeping track <p>9. When we Strive for Quantity:</p> <ol style="list-style-type: none"> We encourage habitual thinking patterns <input checked="" type="checkbox"/> We are fluent thinkers We gain insight into what is important and effective <input checked="" type="checkbox"/> We make meaningful connections <p>10. When we Seek Wild and Unusual Ideas, we:</p> <ol style="list-style-type: none"> Become tense Sustain the status quo <input checked="" type="checkbox"/> Make a mental leap <input checked="" type="checkbox"/> Encourage Imagination <p>Total Possible Correct Answers= 23 Total Correct Answers= 20 Total Incomplete and/or Incorrect Answers= 3 Percent= 86.96% Percent of Change with Movement Tool= 86.96%</p>
---	---

Participant B. Leanne Pedante Percent of Increase After Movement Tool= 17.12%

1	2
Creative Problem Solving Divergent/Convergent Guidelines Questionnaire	
Name Leanne Pedante Pedante Date 11/28/14	
Directions: Please circle the correct answer after the verbal portion of the presentation is completed	
1. When we are ready to Converge it means that we are: <ul style="list-style-type: none"> a. Ready to make decisions b. Ready to produce twice as many good ideas c. Ready to improve ideas d. Ready to trim, tailor, and rework ideas 	
2. Seeking Wild and Unusual Ideas means: <ul style="list-style-type: none"> a. Stretching our thinking b. Invigorating weak ideas c. Letting one idea spur other d. Being guided by our personal prejudices and assumptions 	
3. Being Deliberate means: <ul style="list-style-type: none"> a. Making snap decisions and harsh judgments b. Giving every opinion a fair chance c. Every idea is a workable solution d. Not to evaluate ideas 	
4. When we remember our original goal: <ul style="list-style-type: none"> a. We are Diverging b. We are Converging c. We are brave d. We are checking our objectives 	
5. In order to Defer Judgment we have to: <ul style="list-style-type: none"> a. Evaluate ideas as we generate them b. Not evaluate ideas as you generate them c. Disregard the first idea that comes to our mind d. Evaluate ideas later 	
6. In order to Be Affirmative we need to: <ul style="list-style-type: none"> a. Utilize our "no way" reflex b. Look for what we don't want c. Discipline our positive thinking d. Freewheel 	
7. When Striving for Quantity we are: <ul style="list-style-type: none"> a. Doing the usual to solve challenges b. Not rushing for new options c. Generating as many ideas as possible d. Honing and strengthening ideas 	
8. When we are Combining and Improving ideas we are: <ul style="list-style-type: none"> a. Diverging b. Building on other ideas c. Watching out for "sparking ideas" d. Looking for what we want 	
9. When we are ready to Diverge it means that we are: <ul style="list-style-type: none"> a. Ready to Judge b. Striving for quantity c. Deferring Judgment d. Checking our Objectives 	
10. The Diverging and Converging Guidelines <ul style="list-style-type: none"> a. Are never used together b. Complement each other c. Make us less creative d. Divide our ideas 	
Total Possible Correct Answers= 14 Total Correct Answers= 3 Total Incomplete and/or Incorrect Answers= 11 Percent = 43.75%	

<p style="text-align: center;">1</p> <p style="text-align: center;">Creative Problem Solving Divergent/Convergent Guidelines Questionnaire</p> <p>Name <u>Leatrice Rodgers</u> Date <u>11/28/14</u></p> <p>Directions: Please circle the correct answer after you have completed the movement portion on both mats</p> <p>1. Building on Ideas means:</p> <p><input checked="" type="checkbox"/> <u>Spanning boundaries</u></p> <p>b. Not allowing for other sources of stimulation</p> <p>c. Combining things into their previous form</p> <p><input checked="" type="checkbox"/> <u>Drawing inspiration from one thing when working on another</u></p> <p>2. When we Diverge we:</p> <p><input checked="" type="checkbox"/> <u>Approach challenges with fresh eyes</u></p> <p>b. Choose among options that are too limited</p> <p>c. Enjoy the resolution that comes with converging</p> <p><input checked="" type="checkbox"/> <u>Push ourselves to the point of not knowing</u></p> <p>3. Convergence and Divergence Guidelines:</p> <p>a. Are separated in order that our thinking be more efficient and effective</p> <p><input checked="" type="checkbox"/> <u>Require that we know how to move back and forward between them</u></p> <p>b. Are natural mental processes we use in everyday life</p> <p><input checked="" type="checkbox"/> <u>Happen separately but harmoniously</u></p> <p>4. To Be Affirmative means to:</p> <p><input checked="" type="checkbox"/> <u>Approach evaluation with a constructive attitude</u></p> <p>b. Run with our typical thinking</p> <p><input checked="" type="checkbox"/> <u>Work to overcome flaws</u></p> <p>d. Being close-minded</p> <p>5. When we Converge we:</p> <p><input checked="" type="checkbox"/> <u>Select among the options</u></p> <p>b. Our minds move quickly</p> <p>c. We are more adventurous</p> <p><input checked="" type="checkbox"/> <u>Make order and sense</u></p>	<p style="text-align: center;">2</p> <p>6. The Consider Novelty Guideline:</p> <p><input checked="" type="checkbox"/> <u>Protects and nurtures ideas and options</u></p> <p>b. Puts us back into our comfort zone</p> <p><input checked="" type="checkbox"/> <u>Allow us take some risk</u></p> <p><input checked="" type="checkbox"/> <u>Defend the quest for a creative outcome</u></p> <p>7. To Defer Judgment means that:</p> <p>a. We decide immediately</p> <p>b. We place a stranglehold in our ability to think in original ways</p> <p><input checked="" type="checkbox"/> <u>We suspend skepticism</u></p> <p>d. We praise</p> <p>8. To Be Deliberate means:</p> <p>a. Being persistent</p> <p>b. Apply judgment objectively</p> <p><input checked="" type="checkbox"/> <u>Work towards a defined purpose</u></p> <p>d. Keeping track</p> <p>9. When we Strive for Quantity:</p> <p>a. We encourage habitual thinking patterns</p> <p><input checked="" type="checkbox"/> <u>We are fluent thinkers</u></p> <p>c. We gain insight into what is important and effective</p> <p>d. We make meaningful connections</p> <p>10. When we Seek Wild and Unusual Ideas, we:</p> <p>a. Become tenacious</p> <p>b. Sustain the status quo</p> <p><input checked="" type="checkbox"/> <u>Make a mental leap</u></p> <p><input checked="" type="checkbox"/> <u>Encourage imagination</u></p> <p>Total Possible Correct Answers= 23</p> <p>Total Correct Answers= 14</p> <p>Total Incomplete and/or Incorrect Answers= 9</p> <p>Percent= 60.87%</p> <p>Percent of Change with Movement Tool= 7.82%</p>
---	---