

An Examination of Color and Letter Association Across Culture and Its Implementation into the
Practice of Art Therapy

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Abstract

This paper begins with a general examination of sensation and perception, particularly related to color. Then a further exploration of some findings by Spector and Maurer (2011) will be studied. Across six experiments they examined the association between color and letters. Testing three populations, toddlers, literate children, and adults, they found that preliterate children have a different color letter association compared to literate children and adults. Instead of evaluating color and letter association across age, the present study will analyze the association across cultures. There are four groups of alphabetical symbols, each with four symbols in them. There are the first four Roman symbols (A, B, C, D), and then an equivalent order and shape for alphabetical symbols in traditional Greek, Arabic, a Mandarin languages. Subjects are asked to select from one of the given colors (red, orange, yellow, green, blue, purple, white, black) that they associate most with the alphabetical symbol presented. This data is currently being collected and at a later date, will be analyzed for similarities across cultures for symbol and color association, which will bring to question if the nature of the chosen color is driven by cultural experience or inherent properties of the symbols themselves such as shape or order of presentation. Collectively, these findings as well as knowledge of sensation and perception will be examined under the practical uses of Art Therapy.

If one were to walk into almost any early education classroom, there are a few items that are bound to be there. Among these may be: bins of toys to fuel imagination, a circle mat for everyone to gather during story time, and along the wall, a poster of the letters of the alphabet. Think back to what this poster looked like. Was it long and stretched along the top of the wall or a square shape where the letters were in rows? Did it include a picture of an item that went along with the letter or where the letters just big and bold? Was each letter a different color or were they all the same? Lastly, by starting at this poster every day, were children just learning the alphabet or were they learning something else?

Looking around this rooms involves a wide range of biomedical processes, such as the cones and rods of our eyes gathering light and processing this deep within our visual cortex. One of the actions that takes place involves the process of sensation and perception. Together, sensation and perception not only help us take in and process stimuli from the environment, but allow us to connect meaning to them (Goldstein, 2011). This paper will begin by examining the large scope of sensation and perception, and how these two processes help us identify and put meaning to color. Following, a more in depth look will be given at a study done by Ferrinne Spector and Daphne Maurer from McMaster University, regarding specific associations we have between letters and colors. It is due to our sensation and perceptual ability that we can make these associations, but the larger question is how do we make these associations? Are such associations made due to an innate biological ability, known as bottom-up theory, or is it due to an abstract unconscious construct learned from our environment, known as top-down theory? To help answer these questions and respond to the study by Spector and Maurer, I have developed not only an original study to examine color and letter associations but a new hypothesis on how these associations are formed.

As an attempt to answer Spector and Maurer's next questions, my experiment examining color and letter association across culture is currently underway. Participants include college students between the ages of 18 and 23 years old and are students of four different cultural backgrounds. Professors volunteered the assistance of their classroom, to which the students were each individually asked if they would like to participate. For those students that were willing, they were first given a short questionnaire sheet to fill out before the experiment to gather basic information. All information gathered from the sheets remains anonymous and confidential.

This sheet first asks their age, gender, and ethnicity. Subjects are then asked to circle yes or no for two questions: are you color blind and do you have any other visual impairments other than glasses? Next, subjects are asked, "What is their favorite color?" There are no choices provided; subjects just write in an answer on the line. The last question is, "Is there a reason this is your favorite color?" The purpose of these four questions is to better understand any physical limitations or possible reasons for error that could skew the results of the experiment. In addition, these questions are asked to gain a better understanding of the mental perspective and possible cultural customs of the participant's country.

The procedure of the experiment involves a series of PowerPoint slides. The color and letter association will be examined across four alphabetical symbols. These four are Roman (for the English language), Greek, Mandarin, and Arabic. Four different symbols from each language will be presented. The letter or symbols being tested were chosen based upon the order in which they appear within their language's alphabet, or their number of brushstrokes for those languages whose letters have no order.

There are a total of 25 PowerPoint slides. The first slide explains how subjects will be presented with four groups of symbols and to answer the questions on each slide to the best of their ability. Each set of symbols is presented together, with each symbol being on its own slide. On the right side of the slide, there is the question, “Based on the colors to the left, which do you most strongly associate with the symbol below?” Below this question is the symbol in white having a light gray outline, in order to appear as neutral as possible. Then to the left are eight colored circles: red, orange, yellow, green, blue, purple, white, and black. After the question is read, subjects will then point to which color they most associate with that symbol. After the four symbols from that language there is a slide asking subjects, “On a scale of one to three, how familiar were you with the last set of symbols?,” one being not familiar, two being slightly familiar, and three being very familiar. This pattern is repeated until each of set of symbols are presented. There are a total of 16 different PowerPoints, each with the set of symbols in different randomized order. The two figures below help identify the experiment. Figure one is a sample image of one of the PowerPoint slides asking to associate one of the alphabetical symbols with a color. Figure two is the set of four symbols: Roman, Greek, Arabic, and Mandarin.

Once all of the data is collected, it will be analyzed for similarities across cultures for symbol and color association, which will raise the question of whether the nature of the chosen color is driven by cultural experience or inherent properties of the symbols themselves, such as shape or order of presentation. Similar to Spector and Maurer’s experiment, subjects are being asked to map certain alphabetical letters to colors. Instead of looking at only the English alphabet across ages, this experiment looks at four different languages and the possible patterns between color and symbol association.

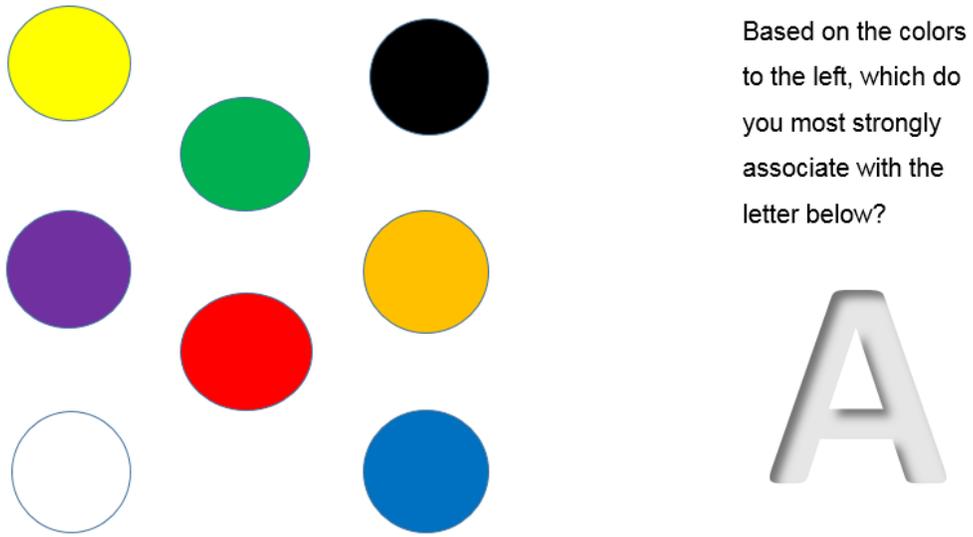


Figure 2: The above figure is a sample PowerPoint from the experiment.

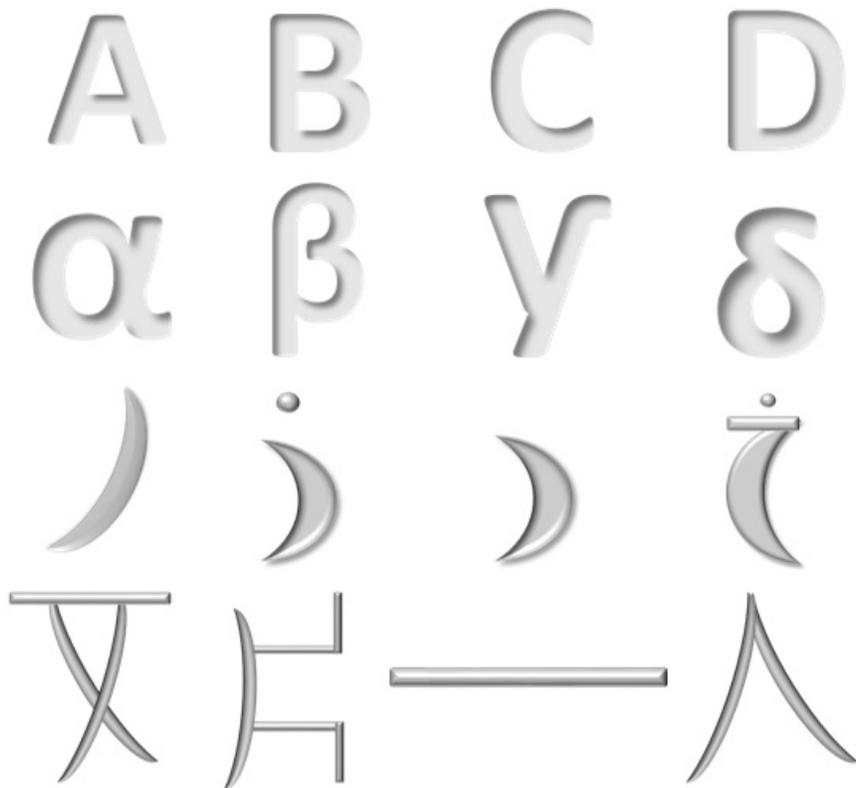


Figure 3: The above image is the set of four alphabetical symbols used within the experiment.

References

- American Art Therapy Association. (2014). About art therapy. *American Art Therapy Association*. Retrieved from <http://www.arttherapy.org/>
- Choungourian, A. (1968) Color preferences and culture variation. *Perceptual and Motor Skills*, 26, 1203-1206. doi: 10.2466/pms.1968.26.3c.1203
- Colizoli O, Murre JMJ, Rouw R (2012) Pseudo-Synesthesia through reading books with colored letters. *PLoS ONE* 7. doi:10.1371/ journal.pone.0039799
- Darley, S., & Heath, W. (2008). *The expressive arts activity book*. London: Jessica Kingsley Publishers.
- George Washington University. (2014). Top down pressings in cognitive psychology. *George Washington University*. Retried from <http://home.gwu.edu/~droliiver/TopDown/>
- Goldstein, B. (2011). *Cognitive Psychology*. Canada: WADSWORTH CENGAGE Learning.
- International Expressive Art Therapy Association. (2015). The flowing tao of expressive arts. *International Expressive Art Therapy Association*. Retrieved from <http://www.ieata.org>
- Macalester University. (n.d.) Grapheme-Color Synesthesia. *Macalester University*. Retrieved from <http://www.macalester.edu/>
- Madden, T., Hewett, K., & Roth, M. (2000). Managing images in different cultures: A cross-national study of color meanings and preferences. *Journal of International Marketing*, 8, 90-107. <http://web.a.ebscohost.com>
- Malchiodi, C. (2007). *The art therapy sourcebook*. New York: McGraw-Hill.
- Maurer, D., Pathman, T., & Mondloch, c. (2006). The shape of boubas: Sound-shape correspondence in toddlers and adults. *Developmental Science*, 9, 316-322. <http://web.a.ebscohost.com>

- Rich, A. N., Bradshaw, J. L., & Mattingly, J. B. (2005). A systematic, large-scale systematic study of synesthesia: Implications for the role of early experiences in lexical-colour associations. *Cognition*, 98, 52-84. <http://web.a.ebscohost.com>
- Schwartz, B., & Krantz, J. (2015). *Sensation and Perception*. Boston: SAGE.
- Spector, F., & Maurer, D. (2008). The colour of Os: Naturally-biased associations between shape and color. *Perception*, 37, 841-847. <http://web.a.ebscohost.com>
- Spector, F., & Maurer, D. (2011). The colors of the alphabet: Naturally-biased associations between shape and color. *Journal of Experimental Psychology*, 37, 484-495. <http://web.a.ebscohost.com>
- Taylor, C., Clifford, A., & Franklin, A. (2013). Color preferences are not universal. *Journal of Experimental Psychology*, 142, 1015–1027. doi: 10.1037/a0030273
- Terhune, D., Tai, Sarah., Cowey, A., Popescu, A., & Kadosh, R. (2011). Enhanced cortical excitability in grapheme-color synesthesia and its modulation. *Current Biology*, 21, 2006-2009. doi: 10.1016/j.cub.2011.10.032
- University of California. (n.a.) Seeing color. *The University of California*. Retrieved from http://web.atmos.ucla.edu/~fovell/AS3/theory_of_color.html
- University of New Hampshire. (2015). How did expressive art therapy begin. *UNH Health Services*. Retrieved from <http://www.unh.edu/health-services/ohep/complementaryalternative-health-practices/expressive-arts>
- Wolf, J. & M, Willmouth. (1985). The role of art in the therapy of anorexia nervosa. *International Journal of Eating Disorders*, Vol 4(2). Retrieved from <http://web.a.ebscohost.com>