Hack the Experience: Tools for Artists from Cognitive Science

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The integrated mind-body connection means that our bodies are tools that we use to think about the world. One of the primary modes of engaging the world is movement and motion in and through the world. Motion dynamics shape the way we think about the world. This is partly why the best way to learn about a new neighborhood is to walk around the neighborhood. By moving through the neighborhood on foot, you interact with that neighborhood in a physical conversation. Movement creates cumulative knowledge of the path of motion.

Motion is a basic mode of experience, it is how we encounter and engage the world. Like other aspects of embodiment, changing the way that people move will change the way they think. Perspective, attention, and viewpoint all change when motion is modulated. Motion dynamics that can be effective in shaping these three elements of experience include:

- slow movement in a large space or over long distances;
- fast movement in a large space or over long distances;
- slow movement in a small space or over short distances; and
- fast movement in a small space or over short distances

These different dynamics can be exploited to create mindfulness and intentionality, to increase observation, and to focus attention; they can also be used to hide, to distract, to bypass, and to blur. This happens because of the role of time that exists in both duration and in tempo. Slow movement takes longer because it has a drawn out tempo and because it takes more time to cover spaces that are larger. Fast movement doesn’t take as long because the tempo is accelerated and the time it takes to cover spaces (even large spaces) is shortened. Slow movement can make a short distance seem long, just as fast movement can make a longer distance seem short.

Viewpoint during slow movement is heightened because there is more time to see the environment as the participant moves through it. This holds true for both participant and spectator viewpoint, although participant slow movement is more perceptible than the variations in movement experienced through spectator viewpoint. This idea that you can see more when slowing down is one of the flows of attention that you can make use of when designing for transformational experiences.

It might be useful to explore oscillations of speed in motion to blend experiences. Try these dynamics:

- oscillating speed in a large space or over long distances, and
- oscillating speed in a small space or over short distances

Switching back and forth between fast and slow movement puts control of attention in your hands as the designer. You can pair the speeds with content to create rhetorical effects in the environment that your audience experiences. You decide when to slow people down and when to move them along.

Up to this point, most of the motion discussed has been motion that the audience engages in as agents. They are moving through the environment. But other types of motion exist that do not depend on agents being in motion. Think of the difference of motion from walking along a country road vs. riding along a country road as a passenger. The views that you experience are different, but it is not as much about speed as it is about agency. When walking, the effect of motion is that of you moving through the landscape, but
when riding, even though you are moving through the landscape, it seems more like the landscape is moving past you. Part of this is because you are sitting still and everything outside the window seems to be rushing past you. This is called the parallax effect and it is a kind of cognitive simulation (much like fictive motion in language) also called frame-relative motion. The world appears to be moving because your frame appears to be static and non-moving. The interior of the vehicle in your immediate view does not appear to change, but everything outside the vehicle is moving rapidly. It is an illusion, and as an illusion, it is a moment for hijacking the senses.

Frame-relative motion can be used to create a kind of ghost movement that persists after the visual/visceral stimulation is gone. For example, sustained and repetitive visual motion (such as a film showing trees in a forest being driven past) creates an expectation of motion that your attention scans, and when the motion stops, your attention is still anticipating motion, so the sense of motion lingers as a ghost movement.

**Simulated Motion, Empathy, and Real Motion**

The traces of motion in two-dimensional and three-dimensional art evoke empathetic responses that engage the body, creating sensations that mirror the muscular gestures that are implied in the work of art. Embodied simulation of these traces of muscular gestures (such as brushstrokes, knife cuts, or bodily motion) occurs as empathetic responses via a system of mirror neurons (Freedberg and Gallese 2007). If a work of art like a painting displays traces of motion from the artist, viewers can pick up on these motions and feel the sense of dynamism of a work of art as they empathetically respond to the motion of the artist through muscular simulation from the activation of mirror neurons. This doesn’t exactly explain why art moves us or define what makes art aesthetically pleasing, but it does suggest that our bodies play a role in how we understand the power of art. Freedberg and Gallese argue that this happens with sculptural forms as well, since viewers experience the “felt activation of the muscles that appear to be activated in the sculpture itself” when responding to physical struggle and exertion of subjects in sculpture. In Umilta et al. (2012), the traces of goal-directed motion that shows up in abstract art are again seen to induce motor representation of the same motion in viewers’ brains. These studies and others (Freedberg 2006; Battaglia et al. 2011; Sbriscia-Fiorretti et al. 2013) suggest that there are significant cognitive responses to visual image-based art, and that we experience empathetic responses to the gestures (motions) of production and content in art. The types of gestures that evoke empathetic responses have image-schematic structure that can be easily replicated in physical space. Although the studies don’t address installation art, it seems likely that physical space can be organized to evoke the same empathetic effects if the composition of the installation contains the same types of image schemas that suggest motion. Image schemas can be a compositional tool when building an installation that unfolds along a path, as they can incorporate suggested motion and dynamism as elements *jut out* into the path, or *rise* or *descend*, or *follow* the path, or *pop up* here or there. You can build elements in physical space that activate the verbs of fictive motion through the composition, and by doing so, tap into empathetic responses to motion in embodied simulation.

**Experience and Movement**

Perceptual experience acquires content (or becomes meaningful) as a result of sensorimotor knowledge that is dependent upon our movement and the nature of objects (Noë 2004), which includes changes in the environment and the type of changes produced by our movement through that environment. Our movement through environments unfolds to create new meaning, and this opens the door for rhetorical uses of designed space through the careful sequencing of information. If movement is tied to the acquisition of knowledge about spatial environments, then the sequencing of stimuli along controlled paths should provide the artist an opportunity to structure visual and sensory information and stimuli in linear narratives. In spatial art, like installation art and architecture, this
structuring takes shape as the coupling of compositional techniques with content: it is the very entanglement of form and function.

The designed physical environments of immersive art have structural composition that is characterized by dimensionality and depth. In flat images like paintings, dimensionality is suggested through compositional techniques like forced perspective, three-point perspective, and other techniques. Image composition is often judged by frameworks like the Rule of Thirds and the golden ratio (among others) to determine what is most aesthetically pleasing to the eye. But Freedberg and Gallese (2007) suggest that embodiment provides a richer and more interesting analysis that explains why we react with emotion to the composition of image-based works.

If image-based works can be explained with embodiment as viewers move their way around an image with their eyes, it seems reasonable to expect that it should also explain immersive works like installations where people, in fact, actually move through the space with their entire bodies.

Image-based works that depict spaces are representational of space, but the physical space of an installation is a direct encounter with space itself. Installation directly engages the body and the senses rather than engaging the viewer through visual approximation of sensory engagement by way of two-dimensional representation. This direct engagement and the design factor of movement through an environment enables the placement of sensory stimuli in sequences and layers that can mimic the way they are organized in real day-to-day life (like a traditional linear narrative), or they can be sequenced in ways that are fractured fragments of reality (like a non-linear narrative).

The path of movement and the manner of movement (speed, mode, etc.) through a designed space can frame the experience and construe elements of the experience in ways that heighten attention and the aesthetic value of the experience. Immersive artworks allow visitors to engage the world of the artwork through direct perception of the light, sound, scent, and other sensory conditions of the space that they move through as participants.

In the following Tools and Chapters, movement paths and manner of movement will be seen through a number of case studies to tie narrative and sensory stimuli to path-based motion through a space.