

Elsewhere I have discussed the principles of embodied expression that are developed in the practice of the performance arts—dance and theatre.¹ These principles, it was argued, disclose the work that must be done in order to transform the human body into an aesthetically expressive medium. That is, precarious balance, the interplay of oppositional energies, and the compression of energy must be mastered if a performance artist is to overcome the artifice of the stage and develop scenic presence. However, in that essay I said little regarding the manner in which the body acquires these skills and little about the effects that the transformation has on the artist's experience of embodiment. I would like to continue here by discussing how the body is modified in the process of developing the skill sets necessary for performance as well as how this developmental process affects the performer's corporeal experience. More specifically, I will draw on the notions of the body schema and the body image in order to clarify how the body can be transformed into an aesthetically expressive medium. In the first section I discuss the functions of the body image and body schema as well as the nature of their interaction. In the second section I discuss what relevance these concepts have for our understanding of the skill acquisition process. Finally, since the points made in the first two sections can be applied to non-performative practices (such as sport, yoga, and martial arts) the last section focuses on the performance arts by discussing how the body schema and body image are developed in order to create a space of effective gesture.

I. Body Image and Body Schema

Shaun Gallagher argues that “The body image consists of a complex set of intentional states and dispositions—perceptions, beliefs, and attitudes—in which the intentional object is one's own body.”² That is, there are three kinds of intentional content that

constitute the body image—the body percept, the body concept, and the body affect. The image of my body is rooted in sensorimotor and kinesthetic perceptions, specific beliefs about my body, as well as emotions that often arise in response to such beliefs.

Perception gives me a sense of the condition of my body at any point in time while conceptions build upon perceptual content and allow one to understand the nature of one's embodiment. For example, the belief that the body is akin to a machine that can run well, break down, be diagnosed, and repaired is widespread since it is based in a widely accepted philosophy of medicine. That is, the body is often conceived as a thing that must be fixed by those who have the expertise that allows them to understand its intricate systems and processes. This example not only gives us insight into the perceptual and conceptual content of the body image but also demonstrates that beliefs about the body are conditioned by culture. This latter point is also supported by observations regarding the manner in which the body is invested with emotion. For example, some may feel frustrated with their bodies since they do not meet social standards of beauty while others experience the joys of physical competition and accomplishment that are brought about by participating in widely practiced games.

This brief discussion illustrates that the image that one has of one's body is a synthesis of perceptual experience, beliefs about the nature of one's body, and emotional responses.

In 1911, Head and Holmes defined the body schema as the postural model of the body.³ On this account, the body schema functions by continually comparing the body's present posture to those held in the immediate past. That is, at the pre-conscious level, the schema provides a standard against which changes in posture can be judged. It must

be stressed that the body schema functions below the surface of consciousness and, unlike the body image, does not include perceptions, attitudes, or beliefs about the body and is consequently not subject to cultural influence. Gallagher notes that the body schema “is a system of sensory-motor functions that operate below the level of self-referential intentionality” for, “it involves a set of tacit performances—preconscious, sub-personal processes that play a dynamic role in governing posture and movement.”⁴ To illustrate, if, while I am sitting and writing, I hear the phone ring in another room, the impulse to answer it will naturally arise, however, in order to rise out of my chair, my body must “know” that it is presently in a sitting posture, “know” where my limbs are in space, and then must calibrate for the necessary movement by shifting weight and changing posture. As Head observes, the body must constantly retain information about posture in order to transition from one posture to the next and this information must be processed automatically at the pre-conscious level since an explicit awareness of this information would make even the simplest movements difficult, if not impossible, to perform efficiently. Indeed, reflecting on the details of movement and posture interferes with efficient action since the desired end that contextualizes movement is lost. That is, if instead of simply standing and going to answer the phone, I first reflect on the present location of my feet, legs, torso, and arms, and then attempt to move them to different places (“place hands on armrests,” “lean torso forward,” “shift weight,” “straighten legs”) then I will not make to the phone on time! This example illustrates the vast quantity of information that must be continually processed by the body schema. It also intimates that it functions in the perceptual background and continually provides the information necessary for formation of the body image. Indeed, the perceptual, conceptual, and

affective content of the body image would be greatly affected by impairments to the schema. More will be said on this in a moment.

The body schema performs three essential functions. As mentioned, it processes information about posture and movement and this entails inputting information from vestibular, articular, cutaneous, muscular, and kinetic sources. The schema's first function, then, is to input and process proprioceptive information. The second function is output, for the schema also includes an array of motor programs (or specific schemata) that are either innate (reflexes) or learned (hurdling, swinging a tennis racket, executing an arabesque, and so on). The schema preserves specific motor programs that stand ready to be elicited by the environment. For this reason, even though I may not have ridden a bicycle in years, when I sit on a bike and peddle a bit, the requisite schemata will spring into action and bike-riding will quickly "come back to me." This is because the body schema maintains the schemata necessary for bike-riding, that is, those necessary for balance, the coordinated movement of the legs, and so on. Finally, the body schema allows for the translation of visual information into proprioceptive information. Hence, if my dance teacher executes a movement and says "do it like this," then, in imitating the movement, my body schema will translate visual information (the image of her form) into proprioceptive information and will allow me to focus my attention on the way that the movement feels.⁵ In the process, the body schema will automatically account for the fact that, when the instructor is facing me, her image cannot be taken at face value for, in order to match her form, it must be noted that what is visually on the right, say, her arm, is indeed her left arm. However, if she turns and faces front—perhaps, because she realizes that my translation skills are not that good (that I am not "getting it")—then my

body will be spatially aligned with hers and imitating her movement will become easier. It can be seen that the translation function is essential for communication. More will be said on this in a moment.

Now, at this point a skeptic may realize that the body schema is a theoretical construct and will go to ask whether or not there is any concrete evidence that would justify our belief in it.⁶ As mentioned, Head and Holmes argue that a preconscious postural schema is necessary for the performance of the simplest of actions. Further, on this account, the schema performs an essential function that contributes to the body's general ability to phenomenologically efface itself, that is, to recede from consciousness and to free up the mental energy necessary for other tasks. This *conceptual argument* draws attention to the staggering amount of information that must be processed if one is to move from posture to posture and also suggests that the body must execute pre-conscious motor functions if one is to focus attention on tasks whose ends lie beyond the confines of the present moment.

However, if the skeptic remains unconvinced then one can appeal to the *empirical argument*. Head and Holmes' studies in pathology explicitly reveal the functions of the body schema by bringing attention to the incapacities and experiences of those whose body schemas are affected by injury. Perhaps the most well known of these cases are those that involve the experience of phantom limbs.

Amputees often perceive sensations in non-existent "limbs." The non-existent limb is perceived since the body schema has not yet assimilated the body's radically altered form and since it continues to output motor responses when the environment elicits movement. Schilder writes that after leg amputation, "The individual feels his leg

and has a vivid impression that it is still there. He may also forget about his loss and [when attempting to walk] fall down. This phantom, this animated image of the leg, is the expression of the body schema.”⁷ The phantom concretely demonstrates that there is a pre-conscious system that integrates movements and postures and, more specifically, it calls attention to the output function of the schema as the schemata utilized in walking continue to exert influence and otherwise ignore the body’s newly revised boundary. It also reiterates the point that the body schema functions pre-consciously since subjects are thetically aware that their limbs are gone, and yet, within the pragmatic context of everyday activity, they will often act as if the limb still exists and is ready to function. The environment continues to elicit schematic output, however, in time, the phantom will likely recede into the stump and patients will no longer make such perceptual mistakes: they will no longer try to walk with nonexistent legs or grab with nonexistent hands.

There are also cases in which the body remains in tact but the schema itself is impaired. For example, in cases of anosognosia and unilateral neglect, patients are unable to attend to or are unable to comprehend anything on a certain side of the body.⁸ There is no sensation since the input function of the schema is impaired and, even though they can see them, patients will often deny that the limbs on the affected side of their bodies are their own. This often results in a sense of alienation. In this context Shaun Gallagher and Jonathan Cole describe the case of Ian Waterman, an individual whose entire body schema was permanently incapacitated by illness.⁹ In the early stages of his recovery, Ian reported a sense of alienation since his body was largely beyond his control. However, he gradually overcame the disability by using the body image to consciously perform the functions that had previously been automatically performed by the schema.

For Ian, simple tasks such as walking and buttoning a shirt must be concentrated on and monitored visually if they are to be completed successfully. Walking is best performed in non-distracting and predictable environments, for if he is distracted or if unexpected circumstances arise, he will likely stumble or fall. Consequently, he reports that driving a car for a hundred miles is much easier than stopping for gas.¹⁰ This is because the comfort of the car, its relatively stable internal environment, and the primacy of vision drastically reduce the somatic factors that he must consciously take into account. This case and other cases similar to it demonstrate how the body schema pervasively influences the quality of everyday experience and, indeed, draws our attention to functions that we, more often than not, take for granted. Ian's experience also reveals a connection between the body schema and a sense of self, for he overcame his sense of alienation by learning how to use the body image to re-inhabit his body. We will return to this in a moment, however, for now it is enough to reiterate that the conceptual and empirical arguments together show that there indeed must be a postural model of the body, one that constantly takes in and processes somatic information and thereby provides the foundation necessary for efficient action. Clearly, it is hard to imagine how one could move if the body did not continually process information a pre-conscious level and studies in pathology support this by demonstrating that the internal postural model can be influenced or impaired by illness or injury.

II. The Body Schema and Performative Somaesthetics

It was mentioned earlier that the body schema functions pre-consciously however, in some instances, it will enter consciousness, that is when a relatively new task that requires the performance and development of new motor skills is undertaken. Gallagher

notes that “the dancer or athlete who practices long and hard to make deliberate movements proficient so that movement is finally accomplished by the body without conscious reflection uses a consciousness of bodily movement to train body-schematic performance.”¹¹ When this occurs, proprioceptive information (especially visual and kinesthetic information) is used to develop schemata that, in time, will be automatically elicited by the environment. Intentional activity is utilized in order to create an increasingly efficient feed-back loop in which accurate commands are given to relevant muscle groups and in which fast, accurate corrections are made if and when errors occur. Of course, this is not limited to professional dancers and athletes, for in learning to dance the cha-cha or swing a golf-club, I too must consciously focus upon the quality of my movement. Indeed, my attempts are akin to those of the professional since we both must use the perceptual information provided by the body image in order to develop the schemata necessary for the achievement of our goals. We are also both alike in that when unfamiliar movements are demanded by the environment, the proprioceptive feed-back loop works relatively slowly and a trial and error process must be undergone until new motor programs are formed by the schema. When this is accomplished, the postures and movements that characterize the activity become familiar, comfortable, and possibly effortless to perform. These remarks (as well as Ian Waterman’s feat of overcoming the incapacities of his body schema) show that educating the body entails using the body image (the perceptual experience of the body) to modify the body schema by developing specific motor programs. It also demonstrates that the body image and the body schema do not work in isolation, but are interconnected.

In order to develop the latter point further it can also be pointed out that a

significant amount of research demonstrates that the body schema has the capacity to affect the body image, that is, that the pre-conscious postural model of the body affects one's conscious experience of the body. For example, changes in the body schema affect the perception of space and intentional action. With regard to the former, changes in mobility, posture, and physical ability caused by abnormality, disease, accident, or other temporary physical change affect the perceptual experience of the body.¹² To take but one example, changes in mobility often lead to an impoverished sense of body integrity and an impoverished sense of the body's boundaries.¹³ More important for our purposes, the emotional evaluation of the body made by individuals who spend large amounts of time and energy engaged in practices that require a great deal of somatic investment (such as dance or sport) tend to be more positive about their bodies than those who do not.¹⁴ Individuals who develop coordination, strength, endurance, balance, agility, and improve posture tend to achieve a high degree of satisfaction with their bodies and this demonstrates that control of movement can influence one's body affect, a component of the body image discussed in section one. Hence, in practicing a performance art, the student will be provided with the opportunity to not only transform the body into an expressive instrument, but he or she will also be given the opportunity to develop the quality of the perceptual and affective experience of the body.¹⁵

It should also be pointed out that the body schema not only conditions experience of the body but also affects the perception of the external environment. That is, the body continually adjusts to the environment below the conscious level as it makes postural adjustments in response to changing external conditions. In order to illustrate this Gallagher gives the example of reading in a gradually darkening room. As the light dims,

one will naturally change posture and lean closer and closer to the book so that the words on the page can be made out.¹⁶ It is only when the posture and eye-strain become manifestly uncomfortable that one realizes that the light needs to be turned on. In this manner, the body continually adapts to the environment and thereby frees up attention to focus on whatever task may be at hand. Moreover, the body schema shapes perception by organizing space in a pragmatic fashion. That is, the perceiving body—the body able to see far but only capable of coming into physical contact with objects “at hand” determines the perceptual field.¹⁷ The sense receptors determine the horizons of somatic experience as does the general spatiality of the body that is grounded by the body schema. As Merleau-Ponty argues, “there is a logic of the world to which my body in its entirety conforms, and ... to have a body is to possess a universal setting, a schema of all types of perceptual unfolding.”¹⁸ For this reason a being that has left and right sides perceives objects in the perceptual field accordingly: they are to the left or right of each other and, more generally, to the left or right of the body itself. Likewise, objects can be either in the foreground or background because the body is closer or farther away from them, respectively.

One last point to make with regard to the interaction of the body schema and the environment centers on the work of James J. Gibson.¹⁹ For Gibson, the world continually presents “affordances” or possibilities of action that reflect particular modes of embodiment. That is, affordances pertain to specific actions, objects, and contexts. For example, a chair affords sitting, a bike affords riding, and a tree affords climbing, and so on. Affordances correspond to particular schemata and are live options only if the relevant schemata stand ready to be elicited by the environment. Further, the affordances

that the environment presents correspond not only with instrumental schemata such as walking, but also with the schemata that have been established through practice. This makes sense when it is remembered that artists and athletes develop their skills in specific contexts: basketball players on basketball courts, dancers on stage, pianists in front of pianos, gymnasts on parallel bars, and so on. It is clear that such individuals develop skill sets that incorporate and capitalize upon specific environments and/or instruments. Because of this—beyond the basic affordances of instrumental movement—the environment presents affordances to these individuals that reflect the skills that they have intentionally developed and refined. Hence, the piano affords playing to the pianist in a manner unfamiliar to me since her body has been developed according to the spatial logic that characterizes the keyboard.²⁰ I would add that the awareness of this difference contributes to the aura of the performances given such individuals, for they present a body that is familiar to the observer (since the environment presents basic affordances to everyone) but—at the same time—quite alien. How can someone move their hands so effortlessly about the keys, seem to defy gravity, or present postures that seem impossible to maintain? The performer's mode of embodiment is simultaneously familiar and foreign since, as a body, it is capable of instrumental movement, however, it is also capable of movement that is contingent upon an integrated system of motor programs that reflect the affordances of a specific instrument or environment.²¹

At this point it should be pointed out that the two relationships that I have been discussing (that between body schema and body image and that between body schema and external environment) unfold in many contexts. Any practice that entails mastering movements and postures and otherwise expending a significant amount of physical

energy entails consciously developing schemata through the use of the body image. Martial artists, athletes, dancers, and gymnasts all establish and maintain various schemata and consequently change the quality of their somatic experience. Likewise, the aura that I described as characterizing effortless performance can be experienced when observing individuals exhibit the techniques of many different practices that require a high level of skill development. It seems then, that I have yet to address what relevance this has for practice of the performance arts.

III. Gesture

A distinction can be drawn between the performance arts and other practices that are contingent upon a high level of somatic development. It is based upon the differing aims of the practices in question. One of the chief aims of both theatre and dance is to create a characteristically aesthetic experience for an audience that capitalizes on the expressive abilities of the human body. For this reason, gesture and, more generally, expressive action must be refined to a high degree if communication is to take place. In this context one cannot do justice to the complexities of gesture, but, nevertheless, I would like to spend a moment or two discussing some general aspects of gesture and then go on to discuss what relevance it has for the performance arts.²²

Indeed, it has often been noted that the performance arts capitalize upon and refine the body's gestural abilities.²³ They must be refined since dancers and actors must overcome the artificial conditions of the stage and express meaningful action to an audience. Their gestures and postures need to be energetically more expressive than those that unfold within the context of everyday life since they must be understood by an audience that is, to one degree or another, spatially removed. Gesture has to radiate

beyond the proscenium arch and one of the main tasks that any performer necessarily has to face is the development of a body that is capable of presenting gestures that are refined in terms of their form, rhythm, tempo, and timing.²⁴ What role does the body schema, then, play in the expression of artistic gesture?

In the course of day-to-day life, gesture normally takes place below the level of consciousness and, like other simple actions, its effortless spontaneity can be disrupted by conscious reflection. For example, when talking with a friend, my hands and arms naturally move in a manner that supplements my speech. I point to objects that I want to draw his attention to, create conceptual spaces in order to ground abstract concepts, make large sweeping gestures to express magnitude, coordinate vocal and physical accents, and possibly even imitate specific actions or objects.²⁵ Again, these movements occur naturally and, if I become aware of them, the natural coordination of speech and movement will be disrupted. Proprioception is essential and, more generally, the postural model of the body must be functioning smoothly if gestures are to contribute to the communicative act.

More specifically, Paillard has argued that the spatial organization of gesture has morphokinetic and topokinetic components that are both contingent upon proper functioning of the body schema.²⁶ The morphokinetic aspects pertain to the shape or form of a gesture while topokinetic aspects pertain to the location of the gesture in space. To take an example, in asking you to bring me a coffee cup I could point to the cup, imitate the style of holding a coffee cup (which entails that I imitate the shape of the cup) or perhaps draw the shape of the cup in the air. If I imitate the style of holding a coffee cup, the gesture's morphology will correspond to the cup's shape. Regarding topology,

enacting the gesture entails matching up specific points (when I draw the outline of the cup I need to connect the lines) as well as the placement of the gesture in space. I want to be sure that I perform the gesture in your field of vision and do not accidentally hit anything (especially the coffee pot!) in the process. Further, if I point to the coffee cup in order to draw your attention to it, I need to be sure that I point in the correct direction. This gesture requires “a precise specification of the initial and final locations of the moving limb in an egocentric and exocentric frame of reference.”²⁷ I must have proprioceptive awareness of my body and limbs as well as an awareness of the relative position of my body in space if the gestures that I make are to be morphokinetically and topokinetically appropriate.²⁸

All gesture requires morphokinetic and topokinetic accuracy, however, the gestures utilized by performance artists require increasing topokinetic accuracy since their gestures must overcome the conditions of the stage. One method of accomplishing this entails the exaggeration of individual movements as well as the integration of individual movements into organic wholes. This process magnifies the energy of each component and thereby makes the gesture clearly visible to the audience. Hence, the simple raising and lowering of an arm can be complemented by a raising and lowering of the body and can be supplemented by subtle movements of the wrist and fingers. This integration magnifies the gesture but it also reveals that the parts of the body utilized in the expression of the gesture are physiologically interconnected and that they can be consciously ordered in order to create movement in which each element of the movement contributes to the realization of a communicative end. Such integration is contingent upon a high degree of proprioceptive sensitivity, control of movement, and upon a clear

awareness of the space of effective gesture. Further, the dancer must have a repertoire of topokinetically precise gestures at hand and, as we saw a moment ago, this is accomplished by using the body image to modify the body schema, that is, to consciously develop and refine specific schemata.²⁹ These include but are not limited to movements of gathering in, pushing away, raising, lowering, and sweeping with the arms, changing the body line, and, more generally, they entail making full use of the range of the joints that are commonly used in the articulation of gesture—hands, wrists, elbows, and shoulders. Further, the dancer must also master variations in muscular tension, rhythm, and tempo since they determine the quality of gesture. Hence, a gesture such as gathering in can be executed slowly and gracefully or quickly and forcefully, that is, the same movement can be executed with varying degrees of tension and relaxation as well as varying degrees of speed. These variations determine the aesthetic significance of the movement.

As mentioned, the development of gestural schemata produces an awareness of the space of effective gesture. Indeed, topokinetic accuracy is essential since the accurate placement of gesture is itself contingent on proprioceptive information, that is, the sense of where the gesture is taking place in space.³⁰ But beyond this, the performer must have developed a tacit awareness not only of which gestures are topokinetically accurate, but also of the communicative space that he can create through movements of the limbs and torso. This includes an awareness of both his “kinesphere” and his spatial relationships to other performers (if there are any) and his audience. Hence, in developing the body’s gestural abilities, the dancer capitalizes not only upon the body schema’s ability to develop precise motor programs but also upon its ability to contribute to an enhanced

awareness of gestural space, that is, the space of effective communication.³¹

This last point leads us to consider the fact that the dancer's gestures do not take place in isolation, but must contribute to the efficacy of a communicative act. That is, the dancer's gestures must create a communicative space for an audience and indeed, the significance of dance is due—in part—to a tacit understanding of the body's gestural abilities. The audience observes the dancer performing a series of significant gestures not only because they are familiar with the gestures that others use to express themselves, but also because audience members are embodied beings that utilize gesture to express themselves. As in everyday life, communicative space is created through the use of gesture however, the dancer magnifies the expressivity of gesture by developing specific motor programs, topokinetic accuracy, as well as the ability to embellish gesture with variations in rhythmic pulse and tempo. She thereby elicits from the audience an awareness of the expressive capacities of the human body.

I raise this point not only because it illustrates the principle of transforming "daily technique" into "extra-daily technique" but also because communicative effectiveness is often used to judge the quality of dance performances. If the performer executes a routine correctly but does not create a communicative space for the audience, then the dance will likely be judged negatively since it will be seen as primarily acrobatic or athletic in nature. Communicative gesture is contingent upon interaction between individuals and interaction is hindered when emphasis is placed on acrobatic movements such as jumps, spins, and flips. These actions are minimally expressive since they entail performing an action for the sake of the action itself. An athlete's actions are not communicative since they do not create a space for communication—the running-back

who rushes for a touchdown is doing just that. It is not until the referee makes a bad call that the running-back engages in a truly communicative act, either by contending it, expressing anger, dismay, or whatever. The athlete's running, sprinting, jumping, hitting, and throwing are all un-expressive in the strict sense since these actions do not communicate meaning in the manner of gesture.³² Consequently, a successful performer, on this account, must draw the audience into the performance not only by exhibiting difficult movements that require an excess of energy, but also by using refined gestures in order to create a communicative space. This leads us to a consideration of acting.

Dancing and acting share a similar repertoire of gestures, however, differences in usage are outlined by the ends that the respective practices strive to achieve. Dancers and actors both gesture toward or away from the body, both use muscular tension to express physical resistance or difficulty, and both use similar postures in the execution of gestures that reflect specific intentional states such as supplication, menace, and joy.³³ They both utilize the more articulate parts of the body in gesturing (as we do in everyday life) and they both create space through the use of gesture—actors, more often than not, utilizing the space that lies in front of the torso and dancers using space more liberally. Of course, what distinguishes the practices is the use of speech. The dancer is most often faced with the task of communicating meaningful gesture to an audience without the use of speech while the actor is faced with the task of correlating speech with movement.³⁴

In theatre, gesture can be seen as either complementing or supplementing speech, that is, it can either aid in reiterating one's point or it can go beyond by speech by emphatically communicating a specific meaning. Gesture is indeed essential for the actor since it contributes to the believability of his performance and one of the chief difficulties

that he faces concerns striking a balance such that gesture aids in the expression of meaning but does not come across—to the audience—as artificial or contrived. The task becomes that of developing an array of gestures that are suitable for a particular character and that can contribute to the movement of scenes and, more generally, to the movement of the work as a whole. Hence, the actor is concerned with creating organic sequences of movement, but the nature of the whole differs from that which characterizes dance gesture. The actor too must integrate the movements of various body parts in the performance of gesture, but much more emphasis is placed on integrating gesture with speech so that the sense of a coherent character can be revealed to the audience.

We saw that the work of the body schema is essential for the production of dance gesture as proprioceptive feedback, specific motor programs, and a general awareness of the space of effective gesture are necessary for the development of an aesthetic effect. In acting, however, there is an important difference as the use of speech influences the execution of gesture. More specifically, research has shown that the gestures that accompany speech are contingent both upon the body schema and “body semantics.” That is, the gestures that are accompanied by speech are linked to the body schema and to linguistic processes.³⁵ For example, the launching and timing of gesture must be integrated with linguistic ability if gestural movement is to supplement speech. So, if, in the course of talking, I want to emphasize a specific point, I will simultaneously use the intonation of my voice and a forceful movement (possibly a striking motion with my arm and hand) to draw my listener’s attention to it. The timing of the gesture is important for the expression of a meaningful statement and further, the general tempo of speech and movement must match, for example, frantic speech is often accompanied by frenetic

movements of the arms and hands. The correspondence of the quality of gesture and the quality of speech are ultimately attributable to a connection between the linguistic centers of the brain and the body schema. Hence, even though theatrical gesture is dependent upon linguistic ability, the work of the body schema remains essential since gesture is always constrained by the physical requirements of motor control. For this reason, unlike the dancer, the actor does not have to memorize and be able to execute a precise series of gestures but can, through practice, develop an array of gestures and, in performance, allow speech and the pragmatic context that it takes place within to elicit the appropriate gesture. When this happens the linguistic system provides the stimulus for the schema which then calls forth the requisite motor programs. Hence, the actor does not need to memorize and master a routine—a series of specific choreographed movements—since the appropriate gesture will be informed by the context—as it is in everyday speech.

Within this context, then, the actor's work consists in developing a wide array of gestures, of explicitly rendering conscious the unconscious gestures that spontaneously unfold in day-to-day conversation. Her habitual gestures—the gestures she uses in everyday speech—must be understood, but further, she must develop gestures that reflect the qualities of an array of characters. This can be done by noting the connection between emotional attitudes (and the modes of speech that characterize them) and the gestures that they commonly elicit. The actor must study this connection and also master the ability to perform gestures that may seem altogether unnatural. For this reason, she, like the dancer, must retain an element of somatic plasticity, that is, the ability to develop new schemata through intentional activity and the habituation process. Also like the dancer, the actor must not only study various gestures, for she must also study the quality

of gesture as it is determined by variations in tempo, rhythm, and quantity of energy.

IV. Conclusion

It has been shown that the performance arts capitalize on the body's expressive abilities by using the body image to develop the body schema. They differ from other somatic practices in that they cultivate the gestural abilities of the human body—dancers studying and developing the possibilities of gestural movement without speech and actors studying and developing the intimate connection between speech and gesture. Both practices entail transforming the body by consciously developing the functions of the body schema, that is, its processing of proprioceptive information, its ability to form and maintain new motor programs, and its ability to translate visual into proprioceptive information.

Ultimately, this transformation entails using intention to consciously develop functions which normally take place below the level of consciousness. In this way the body becomes a locus of aesthetic value for both the performer and her audience.

Before closing, I would like to stress that the body can never become fully transparent to the artist who strives to master it and this is because the very process of transforming it into an expressive medium itself guarantees a certain amount of opacity. That is, since the skill acquisition process is grounded in the formation of habit (or schemata) and since habits function by automatically responding to environmental conditions, while performing, the artist will need to find a way to let the body work. As discussed earlier, the schema is hindered by conscious intent and must be allowed to respond to the demands of the environment. In order to perform effectively the performer must learn how to let the body respond to environmental forces and this can lead to a sense of alienation since the body seems to do things on its own. Somatic skill

development results in an increasing sense of control since the body is consciously crafted to realize the ends espoused by the practice in question, however, the body schema acts as the intermediary between conscious intent and the realization of specific goals. At the simplest level, the schema must preserve the motor habits that have been formed through repetitious practice and, more generally, the fact that it functions pre-consciously ensures that the performer's body will in some sense always remain opaque. Consequently, the performer will learn how to inhabit the body and will make it his own, however, his control will always be constrained by the nature of schematic function. Hence, paradoxically, practicing the performance arts allows artists to actively determine the nature of embodiment however, in the process, the performer will likely realize the degree to which human embodiment is shaped by pre-conscious functions. The body can be consciously inhabited, but never fully.

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- 1 – “Performative Somaesthetics: Principles and Scope” in the *Journal of Aesthetic Education*, 40:4 (Winter, 2006), 104-117.
- 2 – *How the Body Shapes the Mind* (Oxford: Oxford University Press, 2005), 26.
- 3 – “Sensory Disturbances from Cerebral Lesions” in *Brain*, 34 (1911-12), 102-245. Also see Head, *Studies in Neurology*, Volume Two (London: Oxford University Press, 1920).
- 4 – Gallagher (2005), 26.
- 5 – Of course, my instructor also will use language in order to emphasize specific movements and postures. For example, she may use metaphors to draw my attention to the way that those movements and postures should feel.
- 6 – The skeptic might also ask a question regarding where the schema is located. Although—because the schema includes motor schemata that are integrated with specific muscle groups—I think that the question is misguided, it is clear that injuries to specific areas of the brain hinder the functions of the schema. For more on localization see Head and Holmes, “Sensory disturbances from cerebral lesions,” *Brain*, 34 (1911-1912), 102-254. Also see Kinsbourne, M., “Awareness of One’s Own Body: An Attentional Theory of Its Nature, Development, and Brain Basis,” in J. Bermudez, A. Marcel, and N. Eilan, eds., *The Body and the Self* (Cambridge: MIT Press, 1995), 205-223.
- 7 – *The Image and Appearance of the Human Body* (New York: International Universities Press, 1950), 13.
- 8 – Schilder also notes: “Whenever there are disturbances in the postural model of the body, the patients also have difficulty in recognizing the different parts of the bodies of others. They cannot distinguish between their fingers; they cannot recognize the left and right side of the bodies of others. We arrive at the general formulation that the postural models of human beings are connected with each other and that where we are not able to come to a true perception of our own body, we are unable to perceive the body of others” (1950, 43-44). Hence, impaired function of the schema results not only in deficiencies in the processing of proprioceptive information but also in inter-modal communication. For more on the empirical argument see Buxbaum, L.J., Giovannetti, T., and Libon, D., “The role of the dynamic body schema in praxis: Evidence from primary progressive apraxia, *Brain and Cognition*, 44 (2000), 166-191 and Coslett, H.B., “Evidence for a disturbance of the body schema in neglect,” *Brain and Cognition*, 37 (1998), 527-544.
- 9 – “Body Image and Body Schema” in *Body and Flesh: a Philosophical Reader*, Donn Welton, ed. (Oxford: Blackwell Publishers, 1998), 131-148. More information on

the case also be found in Gallagher (2005), Chapter Two: “The Case of the Missing Schema,” 40-64. More on the relationship between the sense of embodiment and a sense of self can be found in Martin, M.G.F., “Bodily Awareness: A Sense of Ownership,” in Eilan et al., (1995), 267-289.

10 – Ibid., 134.

11 – Gallagher (2005), 35.

12 – Ibid., 143-144. Also see Schwoebel, J., et al., “Pain and the body schema: Effects of pain severity on mental representations of movement,” *Neurology*, 59 (2002), 775-777.

13 – See Gardner, R.M., Martinez, R., Espinoza, T., and Gallegos, V., “Distortion of Body image in the Obese: A Sensory Phenomena [sic],” *Psychological Medicine*, 18 (1988), 633-641. Also see Powers, P.S., Schulman, R.G., Gleghorn, A.A., and Prange, M.E., “Perceptual and Cognitive Abnormalities in Bulimia,” *American Journal of Psychiatry*, 144 (1987), 1456-1460.

14 – Adame *et al.*, “Physical Fitness, Body Image, and Locus of Control in College Women Dancers and NonDancers,” *Perceptual and Motor Skills*, 72 (1991), 91-94. Also see Dasch, C.S., “Relation of Dance Skills to Body Cathexis and Locus of Control Orientation,” *Perceptual and Motor Skills*, 46 (1978), 465-466. Also, Davis, C., and Cowles, M., “Body Image and Exercise: A Study of Relationships and Comparisons Between Physically Active Men and Women,” *Sex Roles*, 25 (1991), 33-44.

15 – This is in accord with Richard Shusterman’s emphasis on the use of somaesthetic practices to improve the quality of embodied experience. See his *Performing Live Aesthetic Alternatives for the Ends of Art* (New York: Cornell University Press, 2000), Chapter Eight, 154-181. Also see the Symposium on Richard Shusterman’s *Performing Live*,” *Journal of Aesthetic Education* 36:4 (Winter 2002): 85-115.

16 – Gallagher (2005), 140.

17 – Gallagher (2005), 137-138.

18 – *Phenomenology of Perception*, C. Smith, trans. (London: Routledge and Kegan Paul, 1962), 326.

19 – See *The Ecological Approach to Visual Perception* (Boston: Houghton-Mifflin, 1979).

20 – For more on this see Sudnow, D., *Ways of the Hand: A Rewritten Account* (Cambridge: MIT Press, 2001).

- 21 – This would explain why observers who practice the art being performed will judge the performance differently than those who are unfamiliar with the techniques being executed. The observer who tacitly understands the affordances that are presented by the instruments and/or environments in question will, in some sense, be able to share the experience with the performer. For more on this see Hagendoorn, I., “Some Speculative Hypotheses about the Nature of Dance and Choreography,” *Journal of Consciousness Studies*, 11:3-4 (2004), 79-110.
- 22 – What I mean by “gesture” is often referred to as “gesticulation,” the essential meaning referring to the spontaneous movements of the hands and arms that usually accompany speech. Of course, the human body can express meaning in many ways, but here I am considering the continuum that exists between the spontaneous gestures that accompany everyday speech and those that are used in the performance arts. I should also say that I am not concerned here with the conventional gestures that are often used in the performance arts, the signs (such as the *mudras* used in Odissi and Kathakali dance) that function in a language-like manner. This is not because such gestures are unimportant, but because a consideration of them would require an extended treatment. For more on the classification see David McNeill, *Hand and Mind: What Gestures Reveal About Thought* (Chicago: The University of Chicago Press, 1992), 36-72. For more on *mudras* see Phillip B. Zarrilli, *Kathakali Dance-Drama: Where Gods and Demons Come to Play* (New York: Routledge, 2000) and Rajika Puri, “Bharatanatyam Performed: A Typical Recital,” *Visual Anthropology*, 17 (2004), 45-68.
- 23 – For example, see Susan K. Langer, *Feeling and Form: A Theory of Art* (New York: Charles Scribner’s Sons, 1953), 174-187.
- 24 – Of course, there is much more to imbuing gesture with aesthetic meaning than can be discussed in this essay. Indeed, gesture often takes place within a specific performative context and is influenced by the gestures of others, the use of music, as well as the quality of specific scenes or motifs and is ultimately contextualized by the work as a whole.
- 25 – McNeill (1992, 11-18) classifies these gestures as “iconics,” “deictics,” and “beats.” Iconics include pictorial content of either specific actions or abstract concepts, deictics direct the listener’s attention to specific objective points, and beats emphasize the rhythmic pulse of speech.
- 26 – “Motor and Representational Framing of Space,” Paillard, J., ed., *Brain and Space* (Oxford: Oxford University Press, 1991).
- 27 – Paillard and Cole, “Living Without Touch and Peripheral Information about Body Position and Movement,” Eilan et al., (1995), 256.
- 28 – This part of the essay focuses on topokinetic accuracy since it is contingent upon the

body schema. As we will see in a moment, morphokinetic accuracy is also constrained by the schema, but is also dependent upon the linguistic centers of the brain.

- 29 – This reiterates the general point that body schemata are not fixed, but are active processes that can be developed and modified in order to adapt to the environment. For more on this point see Shontz, F.C., *Perceptual and Cognitive Aspects of Body Experience* (New York: Academic Press, 1969), 162.
- 30 – Indeed, Gallagher (2005, 112-114) notes that, because of his pathology, Ian Waterman’s sense of topokinetic space is highly degraded without visual guidance. Consequently, if he lacks visual information, then his gestures will be topokinetically inaccurate. Further, Paillard and Cole note that before Ian gestures, “he settles into a posture and calculates how much safe space he has in front of him to gesture. Then, with minimal visual feedback, he knows how expansive his gestures can be” (1995, 259).
- 31 – I would suggest that this contributes to the increased sense of body competence and satisfaction described above.
- 32 – Of course, one can say that the running back is expressing something like “aggression” or “competitiveness” but this is doubtful since, while running, the running back is not concerned with communicating to an audience. Indeed, true communication would divert his attention away from the task at hand: rushing and avoiding tackles.
- 33 – Although it will not be addressed here, the significance of these postures is often influenced by cultural standards. That is, generally speaking, gestures are subject to culture since they can become codified. For a discussion of the theatrical codification of gesture see Mullin, D. “Methods and Manners of Traditional Acting,” *Educational Theatre Journal*, Volume 27:1 (March, 1975), 5-22. With regard to the codification of gesture in painting and sculpture see Johnson, D., “Corporality and Communication: The Gestural Revolution of Diderot, David, and The Oath of Horatii,” *The Art Bulletin*, Volume 71:1 (March, 1989), 92-113. A. Kendon discusses the relationship between culture and gesture in “Geography of Gesture,” *Semiotica*, Volume 37 (1981), 129-163.
- 34 – Another key difference is the use of music to supplement the dancer’s gestures. This contributes to their intelligibility since it provides the context for their rhythm and tempo as well as the context for specific accents and variations of force.
- 35 – See Gallagher (2005, 116-129). Also see Iverson, J.M., and Thelen, E., “Hand, Mouth, and Brain: The Dynamic Emergence of Speech and Gesture,” *Journal of Consciousness Studies*, 6 (1999) 19-40 and Ojemann, G.A., “Common Cortical and Thalamic Mechanisms for Language and Motor Functions,” *American Journal of Physiology*, 246 (1984), R901-R903.