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What do we actually see on stage?

A cognitive approach to the interactions between visual and aural effects in the performance of Greek tragedy¹

Anne-Sophie Noel

In this chapter, I propose to *look at* and *hear about* a few theatrical objects in Aeschylus' *Oresteia*, for which visual effects and verbal cues most likely did not match in the course of the performance. I offer close readings of these passages, grounded in a neuroscientific framework and in philosophical theories on the integration of multisensory inputs. In doing so, I aim to shed new light on the multisensory treatment of objects in Aeschylus' dramas and on its reception by its original audience.

Owing to the limitations of the scientific knowledge acquired in this field up to today, this investigation inevitably entails some speculative thinking. However, I hope to demonstrate its heuristic value: gaining a better understanding of the multisensory interactions occurring in ancient theatrical shows can be determining to recast a new definition of *performance* in antiquity. Adopting this perspective seems particularly relevant in the case of Aeschylus' extant dramas, which contain, I will argue, an implied poetics of fluid interactions between aural and visual effects. At a broader level, my goal is to challenge the overemphasis that has been placed upon visual effects, as opposed to verbal effects, in the most current scholarship about the performance of ancient theater.² This focus on actual visual effects produced on stage has been historically important: Performance Studies applied to ancient theater have consisted mainly (and fairly) in re-habilitating the spectacular dimension (ὄψις) against more than two thousand years of scholarly neglect largely deriving from Aristotle's *Poetics*.³

However, time has come for a more comprehensive investigation of spectacle that may benefit from recent research on the brain activity involved in the integration of multimodal sensations.⁴ I will specifically focus on the experience of incongruence between the aural and visual sensations, since this seems to be a specific feature of Aeschylus' dramaturgy.

Multisensory integration in neuroscience and brain theory

Research on embodied cognition and processing of emotions has been applied to performance studies for about a decade now. The main orientation, as traced by the ground-breaking works of Bruce McConachie and Rhonda Blair,⁵ is the exploration of the roles played by the 'mirror neuron system', empathy and embodiment in shaping the relationship between actors and spectators. How the knowledge brought by the neuroscience can impact actor's pedagogy, acting techniques and applied theater is also under investigation in the most recent volumes published in this field.⁶ However, neither multisensory interactions nor the interplay between the senses and imagination have come into focus in this still burgeoning domain.

On the side of functional MRI and multisensory studies, however, a lot of recent research has been done to grasp a better understanding of our daily-life, real-world actions that often stimulate several senses simultaneously.⁷ The spatial organization of multisensory brain regions has been under scrutiny: for instance, the bimodal superior temporal cortex (bSTC) was identified as a portion of the brain that reacts to both visual and auditory inputs and whose responses are enhanced when the inputs are multisensory (auditory-visual).⁸ Researchers in this area admit to still facing important methodological issues: some acknowledge that most experiences, based on the processing of abstract stimulus material (like button press, dot and tone),⁹ fail to reach the complexity of the integration of audiovisual inputs in a real-life context (and *a fortiori*, in an aesthetic work of art). The methodology for reaching more micro-scale results in brain mapping is also still under discussion.¹⁰ In spite of these limitations (that point toward further research), a convergent body of experiences has shown the flexibility of the multisensory system.¹¹ Multisensory integration, defined as the set of processes by which information arriving from individual sensory modalities (e.g. vision, audition, touch) interacts with and influences processing in other sensory modalities, is now well established and has crucial implications for contemporary

sensory neuroscience.¹² The idea that sensory inputs were processed separately in specific unisensory areas before being unified has been abandoned in favor of fluid relationships between interconnected, multisensory brain areas.

In the field of brain theory and philosophy of mind, the conceptualization of perception as a ‘constructive process’¹³ may also be an interesting theory to re-think the spectator’s experience. It argues that far from being a passive ‘recording’ of sensory inputs, perception is an active process in which the brain ‘optimizes the mutual information between its sensory signals and some parsimonious neuronal representations’.¹⁴ The underlying idea is that of the Bayesian brain,¹⁵ which postulates that the brain works as an ‘inference machine’, possessing an internal representation of the world that is not only shaped by sensory inputs, but also shapes them in return to make them cohere with this representation. This has also been termed ‘Prediction Processing’ by Andy Clark:¹⁶ in our perceptual apprehension of the exterior world, we are constantly making predictions about sensory inputs, according to the represented model that we have interiorized. If I hear a banging noise, I will spontaneously make inferences about all the possible sources for this potentially alarming signal and then select the sensory inputs relevant to identify efficiently this signal in given circumstances. Building on this, Andy Clark phrases in a striking way the fact that perception entails imagination:

Such perceivers are thereby imaginers too: they are creatures poised to explore and experience their worlds not just by perception and gross physical action but also by means of imagery, dreams, and (in some cases) deliberate mental simulations.¹⁷

This neuroscientific research and theoretical models allow us to reconsider what it means for a spectator to simultaneously experience multisensory inputs triggered by a theatrical performance, and Peter Meineck has paved the way for applying ‘Prediction Processing’ and the processing of multisensory inputs to ancient Greek drama in his recent ground-breaking monograph.¹⁸ His experimental research on masks convincingly supports the idea that ancient spectators may have been more receptive to the ‘multimodal and sensorimotor facets of speech processing and movement’,¹⁹ because mask-acting requests, for an efficient communication, the combination of ‘highly coordinated movement, gestures, and heightened poetic language’.²⁰ An

hypothesis that I am inclined to challenge, yet, is the emphasis placed on vision at the expense of aural effects: drawing on the McGurk effect, Meineck states that in the performance, ‘the predominantly higher-order cognitive processing of the spoken word is subordinated to the lower-order processing of visual or other somatosensory data’.

The McGurk effect is a multisensory illusion triggered by the processing of a voice articulating a consonant (like [b]), dubbed with a face articulating another consonant (like [g]): the acoustic speech signal is systematically heard as another consonant ([d]), showing that the visual information alters the auditory one.²¹ If this effect has been widely observed at the level of a consonant or a syllable, it has, however, hardly been proven at the level of a short sentence.²² One may legitimately wonder whether this ‘trumping’²³ of auditory input by the visual one is transferrable to such a highly complex aesthetic experience as a theatrical performance.

Having said that, even without resorting to the McGurk effect, it seems evident that vision is a specific trait of drama that is often emphasized in the Greek plays as a more reliable sense,²⁴ and I certainly agree with Green when he writes that ‘there is a good deal of evidence, both literary and pictorial, to suggest that what people perceived as one of the most exciting things about theatre when it was first being invented was the visual spectacle’.²⁵ While acknowledging this dimension, I am keen to bring up excerpts from Aeschylus’ plays that comment on the interactions between visual and aural effects: without downplaying the power of visual perception, they seem to postulate extremely fluid relationships and reciprocal cross-modal influences between them in the performance.

In the parodos of the *Seven Against Thebes*, the women of the chorus run onto the stage and cling to the statues of the gods, expressing their fear of the war to come. This famous passage emphasizes the ‘visual construal of the sound’²⁶ and, reciprocally, the auditory construal of the sight.

ἀκούετ’ ἢ οὐκ ἀκούετ’ ἀσπίδων κτύπον;

πέπλων καὶ στεφάνων <πότε> ποτ’ εἰ μὴ νῦν

ἀμφὶ λιτανὰ <βαλεῖν> ἔξομεν;

κτύπον δέδορκα· πάταγος οὐχ ἐνὸς δορός.²⁷

Do you hear, or do you not, the clatter of shields? When, when, if not now, shall we be able <to adorn the gods> with robes and garlands as prayer-offerings? I see the banging noise—it is the clatter of many spears!²⁸

κτύπον δέδορκα, ‘I see the banging noise’: the phrase suggests a complete merging of the aural and the visual. The women of the chorus address each other in a collective moment of panicking, but it seems rather clear that this address can also be construed as an apostrophe to the audience, prompted to process to the same effort of imagination, stimulated by a particularly powerful series of plosive alliterations miming the clash of weapons.²⁹ In his 2012 article,³⁰ Agis Marinis employs the Aristotelian concept of ἐνέργεια, ‘actualization’, to comment on the way this Aeschylean phrase ‘impels the audience to visualize images, enabling them to participate in the persuasive process through their sensory reaction to words’.³¹ In Andy Clark’s terms, one could say that the women’s speech prompts the spectator’s brain to combine their prior knowledge and internal representation of war with the incoming sensory evidence, to generate a visualization of the arrival of Polyneikes’ army at the seven gates of Thebes—a staging that was, by the way, impossible to realize concretely.³²

This enacted thinking seems all the more important in the *Seven* because it also underlies the famous shields’ *Redepaare*. The shields are material objects that have a dramatic visual impact both on the internal and external audience, yet they are entirely construed by the speeches of both herald and Eteocles.³³ On some shields, inscribed words are materialized, becoming gold or bronze letters, hence being apprehended by senses of audition, sight but also touch, inasmuch as metal may speak to some spectators in terms of texture, hardness and coolness. Along the same aesthetic principle, when the corpses of Eteocles and Polyneikes are finally brought under the eyes of the audience, the women of the chorus state that the discourse of the messenger (λόγος) has been made ‘visible’ (προὔπτος):³⁴ theatrical action consists in making the words heard before become a visual discourse on stage, but everything remains language, be it auditory or visual. Anticipating modern cognitive findings about the cross-modal influences occurring in the processing of multimodal sensory inputs, Aeschylus thus stimulates the vision of the audience with sound and other non-visual inputs (like touch and proprioception), while manipulating the auditory sensation by non-auditory inputs. Therefore, his dramaturgy, I argue, can be considered as an

enacted refutation of ‘visual dominance’, the domination of vision over the other human senses.

Multisensory objects in the *Oresteia*

For two significant objects in the *Oresteia*, Apollo’s bow and Clytemnestra’s net cloth, the audience most probably faced the task to process discordant auditory and visual inputs. Its response to it must have been inevitably various. In her study combining art criticism and neuroscience, Gabrielle Starr notes that all people do not have the same capacity to visualize images in their mind precisely.³⁵ An ancient audience, however trained to the active listening required by regular poetic performances and contests, was probably composed of spectators more or less able to shape internal images eliciting cross-modal sensations. Auditory images, Starr goes on, also differ when they are prompted by plain speech, metrical speech or music³⁶—a diversity that ancient dramatists could exploit fully in a performance that involved meter and music. For the two objects under focus, I am keen to argue that Aeschylus could draw on ‘somatosensory’ language³⁷ to affect the visual processing of the spectators watching a performance: the ‘auditory imagery’ prompted by this powerful affective and sensory language competed with real visual effects on stage.³⁸

In the beginning of *Eumenides* by Aeschylus, the god Apollo, staged in the previous plays of the trilogy as a statue, appears in person to defend his protégé Orestes. He violently chases away the Erinyes who have followed Orestes inside his Delphic sanctuary.

Ἔξω, κελεύω, τῶνδε δωμάτων τάχος
 χωρεῖτ’, ἀπαλλάσσεσθε μαντικῶν μυχῶν,
 μὴ καὶ λαβοῦσα πτηνὸν ἀργηστὴν ὄφιν,
 χρυσηλάτου θώμιγος ἐξορμώμενον,
 ἀνῆς ὑπ’ ἄλγους μέλαν’ ἀπ’ ἀνθρώπων ἀφρόν,
 ἐμοῦσα θρόμβους οὕς ἀφείλκυσας φόνου.³⁹

Out, I tell you, get out of this house at once! Get away from my inner prophetic sanctum, in case you find yourself on the receiving end of a winged flashing snake

speeding from my golden bowstring, and vomit out in agony black foam taken from human bodies, bringing up the clots of blood that you have sucked.⁴⁰

This aggressive stage entrance might be a reminiscence of the first appearance of Apollo on Olympus, in the first *Homeric Hymn*:⁴¹ the god of the bow, Apollo τοξοφόρος or ἑκατηβόλος, according to his traditional Homeric and lyric epithets, boldly aims his taut weapon at the frightened assembly of the gods before being gently disarmed by his mother. In the Aeschylean play, although the text does not hint explicitly at the use of the bow as a theatrical prop on stage, it seems reasonable to suppose that the actor who embodied Apollo did hold a bow and direct it against the Erinyes in a threatening way. The weapon is an emblematic and iconic attribute of the god and was very likely used on stage to make him recognizable. A few decades later, Euripides parodied the systematic use of the attribute in the prologue of his *Alkestis*.

ΘΑ. Τί δῆτα τόξων ἔργον, εἰ δίκην ἔχεις;

ΑΠ. Σύνηθες αἰεὶ ταῦτα βαστάζειν ἐμοί.

Death: If justice, then what need for your bow and arrows?

Apollo: It is my custom always to carry them.⁴²

This may well be a playful metatheatrical comment made by Euripides to criticize an abuse of the use of props, without any larger dramatic purpose. But in the case of the *Eumenides*, the presence of the bow is dramatically meaningful. It lends to Apollo's aggressive orders to the Erinyes a much more threatening aspect—μὴ καὶ λαβοῦσα suggests that if they don't leave at once, they will be shot.⁴³ The silhouette of the actor wielding a bow has a salient character: Apollo's war pose could arguably have startled a predominantly hoplite audience. This offensive posture also clearly has a visual reference: this staged Apollo seems an iconic imitation of paintings or sculptures of the vengeful Apollo, directing his arrows against the Giants, or against the children of Niobe, as on the famous Niobids Crater.⁴⁴ But on stage, he is like a painting that moves and speaks, which might be attention-grabbing and, in passing, realizes the famous aphorism attributed by Plutarch to Simonides.⁴⁵ The arrow maintained under tension, while he addresses the group of Erinyes, also has the potential to stimulate proprioception and create a compelling tension in the audience itself: according to the Prediction Processing model, this visual cue was a prompt to anticipate in imagination

the shooting that may happen—an effect that contemporary film directors constantly exploit by zooming in on hands grasping firing weapons. If one adds that to be heard, the masked actor would have had to face the audience in a frontal way,⁴⁶ one may legitimately raise the hypothesis that the spectators could have been afraid of being struck themselves, as is reported by Macrobius about a Roman pantomime of *Hercules Furens*.⁴⁷ The bow hence stood out from its surroundings and might well have been what neuroscientists call a ‘salient object’,⁴⁸ or ‘a locus for foveal vision’, as Meineck puts it—foveal vision being used for focusing on details and scrutinizing objects.⁴⁹

Apollo’s bow is thus one of these significant props whose presence on stage is highly meaningful.⁵⁰ What strikes me then is the discordance that could appear between the actual object, which was most probably seen on stage, and the way the god describes it. Apollo does not speak of bow and arrows but of a ‘winged flashing snake speeding from [his] golden bowstring’. The verbal cues here are vigorously multisensory: vision is stimulated by the suggestion of the hybrid shape of a ‘winged snake’ (πτηνὸν ὄφιν).⁵¹ Snake and arrow were symbolically associated in the collective imagination of the audience—we may think of the arrows of Heracles, anointed with the poisoned blood of the Lernaean hydra. The shapes of a snake and an arrow were compared in later treatises on animals and hunting, to the extent that P. Monbrun can speak of the snake as the ‘doublet animal de la flèche’.⁵²

Aeschylus nevertheless adds wings to this snake-like arrow; on one level, it may be taken as a metonymic association prompted by the flight of the arrow through the air, and by the fletching or feathers at the back of the arrow. However, the metaphorical formulation may also arouse in the audience’s imagination the visualization of a winged serpent, facilitated by the existence of folkloric beliefs about such a composite creature. Herodotus describes winged serpents (πτερωτοὶ ὄφεις) as a species supposedly living in Arabia.⁵³

The visual stimulation is also achieved through several mentions of color: ἀργηστήν, ‘flashing’, alludes to the shimmering aspect of the snake’s skin.⁵⁴ But it also means white. White is juxtaposed to the golden color, brought into focus with the compound χρυσηλάτου, that relates the bow of this theatrical Apollo to the golden or silver bow that is his attribute in epics and hymnic poetry.⁵⁵ A chromatic contrast then stands out,

between the bright white and gold and the ‘black foam’ that the Erinyes are going to vomit up if they are hit by an arrow. The words of Apollo reactivate a visual leitmotiv that runs throughout the whole trilogy—the contrast between black (black-clad Erinyes, φαιοχίτωνες),⁵⁶ the white attire of the Olympians⁵⁷ and the ominous color of blood, masterfully staged by Aeschylus in the famous ‘carpet scene’.⁵⁸ The color of blood is also hinted at in our passage through the allusion to the blood clots—θρόμβους φόνου (182).

In addition to these multiple visual cues, the kinesthetic sense, the sense of motion or ‘proprioception’, is also stimulated by the allusion to the hurling of the arrow, signaled by the participle ἐξορμώμενον, ‘sent forth with speed’. The allusion to the bowstring was also possibly meant to stimulate auditory sensations, especially because the twang of the bowstring was commonly associated with the vibration of the strings of the lyre, the other emblematic attribute of Apollo.⁵⁹ In the Homeric *epos*, Odysseus, an expert with the bow, is described as an ἀνὴρ φορμίγγος ἐπιστάμενος⁶⁰ and his bowstring makes the shrieking sound of a swallow.⁶¹ In *Iliad* Book I, the arrows that Apollo hurls at the Achaeans speed with a ‘terrible sound or scream’ (δεινὴ κλαγγή, 49).

Thus, verbal cues strategically enrich the visual spectacle of Apollo bending his bow through an amalgamation of meaningful visual, auditory and somatosensory inputs. This first encounter between Apollo and the Erinyes is shaped as a kind of supernatural and cosmic battle, in which glistening winged snakes oppose the whistling snakes that adorn the hair of the Chthonic deities. The god of the Sun threatens the daughters of Night; white and gold are opposed to black and red, *drakôn* against *drakôn*, to borrow a chapter title from Ogden’s monograph.⁶² It could also be construed as a creative remake of the initial battle of Apollo with the serpent Pythô.⁶³

Although this brief two-verse passage was heard by the spectators fleetingly, one can see how Aeschylus stimulates the mind’s eye of the audience, by building on prior cultural memories rooted in the imagination of his audience. The same discrepancy between what was actually seen on stage and what was heard by the spectators is also evident in the case of an even more famous and polysemic object in the *Oresteia*: the many-colored cloth (ποικίλα)⁶⁴ that Clytemnestra uses as a trap for Agamemnon, which

certainly had the visual relief of a ‘salient object’ onstage. Its versatile nature and appearance are made clear through its material reconfigurations in the so-called ‘carpet scene’ and the two tableau scenes of the exposition of the corpses, at the end of *Choephoroi* and *Eumenides*.⁶⁵

One may assume that pieces of purple-colored cloth were used to stage this object, but it is difficult to draw any further conclusion. Its actual nature eludes any monolithic depiction, insofar as through the course of the trilogy, it is named with twenty-four different denominations ranging from plain textiles spread on the ground (πετάσματα) to a variety of clothes (πέπλος, the long tunic; εἶμα, the cloak; καλύμματα, the veils), or even various types of fetter.⁶⁶ Its changing designations transform it successively into a spider web (ἀράχνης ὕφασμα),⁶⁷ a hunting or fishing net (δίκτυον, ἄρκυς, ἀμφίβληστρον, βρόχος, ἄγρευμα)⁶⁸ and a shroud (φᾶρος, δροίτης κατασκήνωμα),⁶⁹ or turn it into chains, fetters or manacles (δεσμός, πέδαι et ξυνωρίς).⁷⁰ This profusion of words, superimposed on the successive material reconfigurations of this object, opens out its nature and significance in an overwhelming way. An ἄπειρον ἀμφίβληστρον, this treacherous cloth is an ‘endless net’, ‘endless’ having both a physical and symbolic meaning here: it does not have any opening for arms or head; it is also ‘endless’ since its identity is never fixed in a unique shape.

This superabundance of verbal tags certainly prompted plenty of visual responses in the audience’s imagination but also a variety of multisensory stimuli. Melissa Mueller rightly speaks of the ‘sensory overload’ of Clytemnestra’s fabrics. She convincingly argues that the strong smell of the *porphyra* dye could have been an extra sensual input provided by the performance.⁷¹ Complementarily, I suggest, the sense of touch was highly stimulated too, not only *in addition to* auditory and visual inputs but actually *through* them. The tactile qualities of the net cloth are triggered off by the verbal cues enumerating the diverse materials—the delicate weaving of the spider web, the coarser feel of the stitching of the net, or the metallic touch of the chains. Moreover, in the scene where the ποικίλα are spread on the ground, the dramatic action consists in observing which way Agamemnon will choose to enter the palace; in other terms, in viewing what his bare feet will touch or not touch⁷² and what impact this haptic contact will have on the fabrics themselves, explicitly associated to his *oikos*’ fortune,⁷³ as well as on his own life. Fearing the jealousy of the gods, Agamemnon is explicitly searching

for an appropriate way to lay his feet on the cloth, delicately, unlike one would do for ‘foot-wipers’ (ποδοψήστρων). Moreover, if Aeschylus had actually used murex for these stage tapestries—we cannot have any certitude about this, but it seems quite plausible that spectators could themselves have been in a comparable state of doubt⁷⁴—the scene would have aroused the added threat of the actor destroying the delicate dye as well.

Another layer of multisensory stimulation, spurring the spectator’s haptic sense, is the well-known visual and symbolic association between this path of cloth and a flow of blood pouring from the cursed palace of the Atrids.⁷⁵ The polysemy of the twice-occurring term πόρος (πορφυρόστρωτος πόρος)⁷⁶ has rarely been noticed: the path is not only an earthly one, it also runs like a purple stream, a purple river or a strait, all meanings carried by the substantive πόρος.⁷⁷ The metaphorical transmutation of cloth into a fluid element is supported by this wording and induces a corollary new set of sensual experience: Agamemnon’s feet do not only touch the textiles, but are also splashed by a flow of blood. The epithet πορφυρόστρωτος (a notable *hapax*) also reinforces the aqueous nature of the stream of cloth: applied to πόρος, it is reminiscent of the famous and puzzling homeric ‘purple sea’,⁷⁸ which is not to be understood as a sea reflecting the color of sunset, but as a mass of water animated by the ‘bubbling of fermentation’ and a ‘shimmering surface’⁷⁹ similar to that of the *porphura*. Scholars interested in the history of the senses and synesthesia recently reconsidered the question: A. Grand-Clément notes that in archaic poetry, ‘la référence chromatique se trouve parfois associée à d’autres notions, qui ne sont pas nécessairement visuelles, comme le mouvement, les matières et les textures, les odeurs, les sonorités’.⁸⁰ This is very close to what M. Bradley wrote, defining color as an ‘object-centered experience’,⁸¹ ‘imbued with sensory property beyond the visual domain’ in ancient Greece.⁸² In the Aeschylean drama, this first association of purple and stream (πορφυρόστρωτος πόρος) anticipates the later connection made by Clytemnestra between the purple color and the endless flow of the sea:⁸³ this verbal imagery has a great coherence and strongly heightens the sensory properties of the prop seen on stage. Thus, Aeschylus allows his audience to simultaneously witness and build in their mind a vivid image of Agamemnon’s walk home that foreshadows the fatal bath in which he is going to die behind the doors of the palace. In that regard, he manipulates not only the sensory responses induced by this versatile object but also the different time

dimensions, since past and future murders are united in this flowing stream of blood—giving to Heraclitus’ claim about ever-changing water a gruesome scenic incarnation.⁸⁴

Like Apollo’s bow, the net cloth is therefore another striking case where powerful, sensory-loaded words overwhelm the visual spectacle represented on stage. Even in today’s big-budget theatrical productions of the *Oresteia*, staging the ‘carpet scene’ and the net cloth, these two sides of the same versatile object, is a challenging task.⁸⁵ There is no material object that can match the versatility and hybridity of the object constructed by the auditory and visual interactions. Hence it may be worth asking the following questions: when the spectators of the *Oresteia* left the theater, what would they have remembered? The simple prop likely used to materialize the bow on stage, or the snake-like winged arrow, threateningly aimed by Apollo against the Erinyes? The material pieces of red clothes actually spread on stage, or the monstrous, hybrid and versatile object that the multisensory cues prompted in their imagination?

I am inclined toward the latter and this conviction may now be supported by neuroscience and contemporary brain theory. As stated in the beginning of this chapter, perception is now interpreted as a ‘constructive process’ in which prior knowledge and sensual predictions about what is being seen play a crucial role. The progress made in functional brain imaging also conduced to good evidence that the mental imagery and visual perception activate many of the same brain early processing areas:⁸⁶ imagined sensation and actual perception involve the sensory modes in a comparable manner,⁸⁷ which leads Clark to assume that ‘perceiving, imagining, understanding, and acting are now bundled together, emerging as different aspects and manifestations of the same underlying prediction-driven, uncertainty-sensitive, machinery’. Of note is also the dramaturgic construction of the trilogy, drawing on mirror scenes,⁸⁸ anticipations and resurgences of visual and verbal leitmotifs: auditory images, which are organized temporally rather than spatially,⁸⁹ can benefit from the fact that they are reminded and reconfigured smoothly, gaining a growing pervasiveness throughout the course of the trilogy.⁹⁰ Therefore, if I do not want to reduce the diversity of subjective sensory experiences encountered by the spectators, I am defending an interpretation of Aeschylus’ plays as works profoundly engaged with multisensory interactions that challenged visual dominance, in favor of the co-working of perception and imagination.

This investigation can have broad implications for the study of ancient performance. Visual effects are currently too restrictively understood as visible material staging. The stress should rather be placed on the interplay between the senses allowed by the combination of aural cues and visual effects, on the one hand, and the cognitive processes that go on in the imagination of the spectators of the performance. This shift of paradigm for performance studies as applied to ancient Greek tragedy may well bring new arguments against negative judgments still circulating today: Greek tragic stagecraft would produce an ‘austere’ theatrical art, a ‘minimalist’ or ‘highly formal’ performance with very few spectacular effects.⁹¹ Such preconceived ideas seem to derive from an essentially visually focused definition of a performance that urgently needs to be questioned.

References

- Billault A., 2001, ‘Le spectacle tragique dans la *Poétique* d’Aristote’, in A. Billault and C. Mauduit, *Lectures antiques de la tragédie grecque*. Lyon. 43-59.
- Blair R., 2008, *The Actor, Image, and Action: Acting and Cognitive Neuroscience*. London, New York.
- Blair R. and Cook A., 2016, *Theatre, Performance and Cognition: Languages, Bodies and Ecologies*. London.
- Bradley M., 2013, ‘Colour as a synaesthetic experience in antiquity’, in S. Butler and A. Purves, *Synaesthesia and the Ancient Senses*. Durham, NC. 127-140.
- Bradley M., 2015, *Smell and the Ancient Senses*. Abingdon, New York.
- Brosch M., Selezneva E., Scheich H., 2005, ‘Nonauditory events of a behavioral procedure activate auditory cortex of highly trained monkeys’. *Journal of Neuroscience*, 25, 6797.
- Butler S. and Purves A., 2013, *Synaesthesia and the Ancient Senses*. Durham, NC.
- Calame C., 2006, *Pratiques poétiques de la mémoire: représentations de l’espace-temps en Grèce ancienne*. Paris.
- Chaston C., 2010, *Tragic Props and Cognitive Function: Aspects of the Function of Images in Thinking*, Mnemosyne Supplements 317. Leiden/Boston, MA.
- Clark A., 2015. *Surfing Uncertainty: Prediction, Action, and the Embodied Mind*. New York.
- Cleland L., 2007, *Greek and Roman Dress from A to Z*. London, New York.

- De Marinis M., 2009, 'Aristotele teorico dello spettacolo nella *Poetica*', online publication on 22/10/2009, <http://drammaturgia.fupress.net/saggi/saggio.php?id=4275>.
- Detienne M. and Vernant J.P., 1974, *Les Ruses de l'intelligence, la mètis des Grecs*. Paris.
- Falletti C., Gabriele S. and Jacono V., 2016, *Theatre and Cognitive Neuroscience*. London.
- Ferrini M.F., 2000, 'La porpora e il mare', *AIV*, 158 (1), 47-94.
- Frazier F., 1998, 'Public et spectacle dans la *Poétique* d'Aristote', *Cahiers du GITA*, 11, 123-144.
- Frontisi-Ducroux F., 1975, *Dédale: Mythologie de l'artisan en Grèce ancienne*. Paris.
- Ganis G., Thompson W.L., Mast F. and Kosslyn S.M., 2004, 'The brain's mind's images: The cognitive neuroscience of mental imagery'. In M.S. Gazzaniga (ed.), *The Cognitive Neurosciences*. Cambridge, MA: MIT Press. 931-941.
- Gentile F., van Atteveldt N., De Martino F. and Goebel, R., 2017. 'Approaching the ground truth: Revealing the functional organization of human multisensory STC Using ultra-high field fMRI'. *Journal of Neuroscience*, 37(42), 10104-10113.
- Goheen Robert F., 1955, 'Aspects of dramatic symbolism: Three studies in the *Oresteia*', *The American Journal of Philology*, 76.2, 113-137.
- Grand-Clément A., 2011, *La Fabrique des couleurs: histoire du paysage sensible des Grecs anciens: VIIIe-début du Ve s. av. n. è.* Paris.
- Grand-Clément A., 2013, 'La mer pourpre: façons grecques de voir en couleurs. Représentations littéraires du chromatisme marin à l'époque archaïque'. *Pallas*, January, 92, 143-161.
- Green J.R., 1994, *Theatre in Ancient Greek Society*. London, New York.
- Halm-Tisserand M., 2002, 'Le filet: un "leitmotiv" dans l'*Orestie* d'Eschyle'. *Ktèma*, 27, 293-305.
- Harrison G.W.M. and Liapis V., 2013, *Performance in Greek and Roman Theatre*. Leiden, Boston, MA.
- Jenkins I.D., 1985, 'The ambiguity of Greek textiles', *Arethusa*, 18, 109-132.
- Kosslyn S.M., Behrmann M. and Jeannerod, M., 1995. 'The cognitive neuroscience of mental imagery'. *Neuropsychologia*, 33(11), 1335-1344.

- Lebeck A., 1971, *The Oresteia: A Study in Language and Structure*. Cambridge, MA, Harvard University Press.
- Lee M., 2004, “‘An evil wealth of garments’”, deadly πέπλοι in Greek tragedy’. *CJ*, 99.3, 253-279.
- Mackay A., 2008, *Orality, Literacy, Memory in the Ancient Greek and Roman World*. Leiden, Boston, MA.
- Mackie C.J., 2004, *Oral Performance and Its Context*. Leiden, Boston, MA.
- Malafouris L., 2013. *How Things Shape the Mind: A Theory of Material Engagement*. Cambridge, MA.
- Marinis A., 2012, ‘Seeing sounds: Synaesthesia in the parodos of *Seven Against Thebes*’. *Logeion, A Journal of Ancient Theatre*, 2, 26-59.
- Mate J., Allen R.J. and Baqués J., 2012, ‘What you say matters: Exploring visual–verbal interactions in visual working memory’, *The Quarterly Journal of Experimental Psychology*, 65, 3.
- McConachie B., 2008, *Engaging Audiences: A Cognitive Approach to Spectating in the Theatre*. New York.
- McConachie B., 2013, *Theatre and Mind*. Basingstoke, New York.
- McConachie B., 2015, *Evolution, Cognition, and Performance*. Cambridge.
- McConachie B. and Hart E., 2006, *Performance and Cognition, Theatre Studies and the Cognitive Turn*. London, New York.
- McGurk H. and McDonald J., 1976, ‘Hearing lips and seeing voices’, *Nature*, 264, Dec., 23-30.
- Meineck P., 2011, ‘The neuroscience of the tragic mask’, *Arion*, 19, 1, 113-158.
- Meineck P., 2012, ‘The embodied space: Performance and visual cognition at the fifth century theatre’. *New England Classical Journal*, 39.1, 3-46.
- Meineck P., 2015, ‘The affective sciences and Greek drama’, SCS talk, www.academia.edu/20484133/The_Affective_Sciences_and_Greek_Drama.
- Meineck P., 2017, *Theatrocracy: Greek Drama, Cognition, and the Imperative for Theatre*. Abingdon, New York.
- Minchin E., 2001, *Homer and the Resources of Memory: Some Applications of Cognitive Theory to the Iliad and the Odyssey*. Oxford.
- Monbrun P., 2007, *Les Voix d’Apollon, L’arc, la lyre et les oracles*. Rennes.

- Mueller M., 2016, *Objects as Actors: Props and the Poetics of Performance in Greek Tragedy*. Chicago, IL.
- Muñoz, A.I., 2012. 'Métrique et tropes dans deux tragédies D'Eschyle: les sept contre thèbes et les Perses'. *Classica - Revista Brasileira de Estudos Clássicos*, 25, 1, 175-218.
- Noel A.-S., 2013, 'Le vêtement-piège et les Atrides: métamorphoses d'un objet protéen', in B. Le Guen and S. Milanezi (eds.), *L'appareil scénique dans les spectacles de l'Antiquité*. Paris. 161-182.
- Noel A.-S., 2014, 'L'arc, la lyre et le laurier d'Apollon: de l'attribut emblématique à l'objet théâtral', *Gaia, revue interdisciplinaire sur la Grèce archaïque*, 'Objets de la mythologie (2)', 17, 105-128.
- Ogden D., 2013, *Drakôn: Dragon Myth and Serpent Cult in the Greek and Roman Worlds*. Oxford.
- Pallidini L.P., 2016, *A Cloud of Dust: Mimesis and Mystification in Aeschylus' Seven Against Thebes*. Oxford.
- Revermann M., 2006, 'The competence of theatre audiences in fifth- and fourth-century Athens', *JHS*, 126, 99-124.
- Roisman H.M. (ed.), 2014, *The Encyclopedia of Greek Tragedy*, 2 vols. Chichester.
- Schmid C., Büchel C. and Rose M., 2011, 'The neural basis of visual dominance in the context of audio-visual object processing'. *Neuroimage*, 55, 304-311.
- Segal C., 1977, 'Synaesthesia in Sophocles'. *Illinois Classical Studies*, II, 88-96.
- Shaughnessy N. (ed.), 2013, *Affective Performance and Cognitive Science: Body, Brain, and Being*. London.
- Sifakis G.M., 2013, 'The misunderstanding of *opsis* in Aristotle's *Poetics*', in G. Harrison and V. Liapis, *Performance in Greek and Roman Theatre*. Leiden, Boston, MA. 45-61.
- Small J.P., 1997, *Wax Tablets of the Mind: Cognitive Studies of Memory and Literacy in Classical Antiquity*. London, New York.
- Squire M., 2016, *Sight and the Ancient Senses*. London, New York.
- Stanford W.B., 1936, *Greek Metaphor: Studies in Theory and Practice*. Oxford.
- Starr G.G., 2013, *Feeling Beauty: The Neuroscience of Aesthetic Experience*. Cambridge, MA, London.

- Straube B., van Kemenade B.M., Arian B.E., Fiehler K., Leube D.T., Harris L.R. and Kircher T., 2017, 'Predicting the multisensory consequences of one's own action: BOLD suppression in auditory and visual cortices'. *PloS One*, 12, 1, e0169131.
- Talsma D., Senkowski D., Soto-Faraco D. and Woldorff M.G., 2011, 'The multifaceted interplay between attention and multisensory integration'. *Trends in Cognitive Sciences* 14, 9, 400–410.
- Taplin O., 1977, *The Stagecraft of Aeschylus: The Dramatic Use of Exits and Entrances in Greek Tragedy*. Oxford, London.
- Taplin O., 1978, *Greek Tragedy in Action*. Berkeley, CA.
- Telò M., 2013, 'Aristophanes, Cratinus and the smell of comedy'. In S. Butler and A. Purves, *Synaesthesia and the Ancient Senses*. Durham, NC. 53-69.
- Trieschnigg C., 2016, 'Turning sound into sight in the chorus' entrance song of Aeschylus', in V. Cazzato and A. Lardinois (eds), *The Look of Lyric, Greek Song and the Visual*. Leiden, Boston, MA, 217-237.
- Van Engen K., Xie, Z. and Chandrasekaran B., 2017, 'Audiovisual sentence recognition not predicted by susceptibility to the McGurk effect'. *Attention, Perception, & Psychophysics*, 79, 2, 396-403.
- Watson J., 2001, *Speaking Volumes: Orality and Literacy in the Greek and Roman World*. Leiden, Boston, MA.
- Wiles D., 1990, 'Le décor des *Sept contre Thèbes* d'Eschyle. Approche structuraliste', trans. P. Ghiron-Bistagne, *Cahiers du GITA* 6 (1990/1), 145–160.

Notes

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² For instance, in the recent reference volume edited by Harrison and Liapis (2013), performance studies are defined as being about 'the non-verbal constituents of ancient theater' (1). In her study of tragic props, Chaston (2010) also privileges the visual impact of props as

‘images’ which may ‘serve a cognitive function in thinking and problem solving’ (1). Therefore, although focused on tragic objects and adopting a cognitive perspective, Chaston’s monograph proposes neither any dramaturgical analysis of the tragic stagecraft nor a study of cognitive processing of multisensory stimuli in the performance of Greek tragedy.

³ Aristotle’s comments on the value of ὄψις are more complex and nuanced than a simple dismissal. For a discussion about this, see Taplin 1977 (477-479); Frazier 1998; Billault 2001; de Marinis 2009; Sifakis 2013.

⁴ Telò 2013 (53-69) pursued a comparable goal in a chapter about synesthesia in ancient Greek comedy. He states that the importance of ‘the more carnal senses of touch, taste, and smell’ in comedy calls ‘into question the epistemological centrality ascribed in ancient (as well as modern) times to sight and to foster an alternative aesthetic regime that enhances the inherently visual quality of theatrical performance’. Although I focus mainly on audio-visual interactions in this chapter, I believe other senses were also involved in the experience of tragic spectators (like touch and proprioception), as will be seen below.

⁵ McConachie and Hart 2006; McConachie 2008, 2013, 2015; Blair 2008, Blair and Cook 2016.

⁶ Falletti *et al.* 2016.

⁷ Straube 2017 (2); Clark 2015 (64).

⁸ Gentile *et al.* 2017 (10104).

⁹ Straube *et al.* 2017 (20).

¹⁰ Gentile *et al.* 2017.

¹¹ Gentile *et al.* 2017 (10111).

¹² Clark 2015 (86).

¹³ Friston 2010 (3).

¹⁴ Friston 2010 (6).

¹⁵ Doja *et al.* 2007.

¹⁶ Clark 2015.

¹⁷ Clark 2015 (85).

¹⁸ Meineck 2017.

¹⁹ Meineck 2017 (188).

²⁰ Meineck 2017 (187).

²¹ McGurk and McDonald 1976; Meineck 2017 (181, ‘the audience’s visual processing system trumps the audience’s auditory processing system’).

²² Van Engen *et al.* 2017. They show that further research on audiovisual integration should involve different types of text material.

²³ Meineck 2017 (181).

²⁴ Cf. Chaston 2010 (27).

²⁵ Green 1994 (16-17).

²⁶ Marinis 2012 (26).

²⁷ Aeschylus, *Seven*, 100-103.

²⁸ Trans. Sommerstein, Loeb, 2008 modified.

²⁹ These are proper ‘somatosensory words’, to put it in Meineck’s terms (2017 (191-195)). Music and metric also probably impacted greatly auditory images, see Starr 2013 (78); for a metrical analysis of this choral ode, see Muñoz 2012.

³⁰ Marinis 2012; see also Trieschnigg 2016.

³¹ Marinis 2012 (40).

³² Cf. Clark 2015 (85).

³³ Cf. Chaston 2011 (67); Pallidini 2016 (113-114) *contra* Wiles 1990.

³⁴ Aeschylus, *Seven*, v. 847.

³⁵ Starr 2013 (77).

³⁶ Starr 2013 (78).

³⁷ Meineck 2017 (191-195).

³⁸ Taplin 1977 (325).

³⁹ (*Eum.*, 179-185)

⁴⁰ Trans. Sommerstein (Loeb 2008).

⁴¹ *HH Ap.*, 1-9.

⁴² Trans. Kovacs (Loeb 1994).

⁴³ Apollo has promised to Orestes that ‘he will not be soft to [his] enemies’ (*Eum.*, 65-66).

⁴⁴ Attic red-figure Kalyx Krater attributed to the Niobid painter, ca. 460-450 BC, Paris, Musée du Louvre, inv. G 341; see Noel 2014.

⁴⁵ *Plutarch, De gloria Atheniensium*, 3.347a.

⁴⁶ My grateful thanks go to Peter Meineck for drawing my attention to mask frontality here; see Meineck 2011 (139-142).

⁴⁷ Macrobius, *Saturnalia* 2.7.16–18: ‘When Pylades acted the part of the insane Hercules and some thought he wasn’t maintaining the gait appropriate to an actor, he took his mask off and scolded the people who were laughing by saying “Idiots! I’m dancing a madman.” In the same play, he shot an arrow into the audience. And when he was acting Hercules at Augustus’ behest in his dining hall, he aimed his bow and shot some arrows—and Augustus thought it only fair to find himself in the same position, vis-à-vis Pylades, as the Roman people has been’.

⁴⁸ Talsma et al. 2011 (401): ‘Visual objects are said to be highly salient when they have a particularly distinctive feature with respect to the neighboring items and the background, or if they occur suddenly’.

⁴⁹ Meineck 2012 (122).

⁵⁰ Taplin 1977 (36): ‘It is not difficult to think of stage properties which are so imbued with dramatic significance that it would do positive harm to the play in performance if they were not straightforwardly represented; the purple cloth in *A. Ag*, the sword in *S. Aj*, the bow in *S. Phil*, or *E. Her*, the image of Artemis in *IT* and many others’. See also Taplin 1978 (18-19).

⁵¹ In his 1936 essay, Stanford rightly labeled this type of metaphor as ‘*synaesthetic* or *intersensal* metaphor’ (48); this synesthetic quality must nevertheless be considered as triggering a real multisensory experience and not only be seen as a rhetorical ornamentation. On synesthesia in Sophocles, see also Segal 1977.

⁵² See *Nicander’s Theriaca* and *Oppian’s Cynegetics*, mentioned in Monbrun 2007 (234-243).

⁵³ Herodotus II, 75, 76.

⁵⁴ There might be wordplay here too, because the rare substantive ἀργής could designate a kind of serpent, in a literal or metaphorical way (Achae. 1, Trag. Adesp. 199; ὄφις ἀργής, Hippocrates, *Epidemiae* 5, 86).

⁵⁵ *Iliad*, II, 764; V, 509; XXIV, 605-606; Callimachus, *Hymn to Apollo*, 32-35.

⁵⁶ *Cho.*, 1049.

⁵⁷ *Eum.*, 351, πάνλευκοι πέπλοι.

⁵⁸ On this scene, see further on and the discussion in Lebeck 1971 (74-79; 80-91); Taplin 1977 (314-316); Jenkins 1985; Halm-Tisserand 2002; Noel 2013; Mueller 2016 (48-57).

⁵⁹ Euripides, *Heracles*, 1064 (τοξήρει ψαλμῶ); *Bacch.*, 783-784; Aeschylus, fr. 57, l. 7 *TrGF3* Radt; Telestes, fr. 6; Diogène trag., fr. 1.

⁶⁰ *Od.*, XXI, 406.

⁶¹ *Od.*, XXI, 411-412.

⁶² Ogden 2013 (215).

⁶³ Ogden 2013 (192-195).

⁶⁴ *Ag.*, 923, 935, 946, 957.

⁶⁵ That the tapestry and the ‘net cloth’ are different avatars of the same object is already suggested by Lebeck 1971 (81, 85) and Taplin 1977 (314); more recently, see Noel 2013 (164-168); Mueller 2016 (60-62).

⁶⁶ For a complete list, see Noel 2013 (166-167).

⁶⁷ *Ag.* 1492.

⁶⁸ Δίκτυον (*Ag.*, 1115, *Cho.*, 999); ἄρκυς (*Ag.*, 1116, *Cho.*, 1000); ἄπειρον ἀμφίβληστρον (*Ag.*, 1382); ἀμφίβληστρον (*Cho.*, 492); βρόχος (*Cho.*, 557); ἄγρευμα θηρός (*Cho.*, 998). See the typology of Halm-Tisserand 2002.

⁶⁹ *Cho.*, 999, 1011; *Eum.*, 634.

⁷⁰ *Cho.*, 493, πέδαι δ’ ἀχάλκευτοι; *Cho.*, 981, τὸ μηχανημα, δεσμὸν ἀθλίῳ πατρί; *Cho.*, 983, πέδαις τε χειροῖν καὶ ποδοῖν ξυνωρίς; *Cho.*, 1000, ποδιστῆραι πέδαι. See *Od.*, VIII, 266sq. on

Hephaistos' net. On affinities between cloth and metal in Greek thought, see Détienne and Vernant 1974 (279); Frontisi-Ducroux 1975; Jenkins 1985 (121); Noel 2013.

⁷¹ Mueller 2016 (56).

⁷² Agamemnon does take off his *arbulai* (944-945) and the act of walking on the pieces of cloth is evoked verbally several times before being effectively performed by Agamemnon (906-907, 924-925, 936, 948, 957). Clytemnestra prevents him from touching the ground with his feet (μὴ χαμαὶ τιθεῖς τὸν σὸν πόδ', 907).

⁷³ Ag., 948-950; 958-965.

⁷⁴ The purple colour could be obtained with cheaper material than the very expensive murex (for instance with woad and madder; see Cleland et al. 2007 (155)), but the difference was not necessarily visible in a one-time performance.

⁷⁵ Lebeck 1971; Taplin 1977.

⁷⁶ Ag., 910, 921.

⁷⁷ Cf. *Persians*, 453, 875, *Cho.*, 366, *Eum.*, 452, *PE*, 532.

⁷⁸ *Iliad*, XVI, 91; also 'purple wave', *Iliad*, I, 482; XIV, 16; XXI, 326; *Od*, II, 428; XI, 243.

⁷⁹ Bradley 2013 (133).

⁸⁰ Grand-Clément 2013 (129).

⁸¹ Grand-Clément 2013 (132).

⁸² Bradley 2013 (132-135).

⁸³ Ag., v. 958-960. Building on Ferrini (2000), Grand-Clément (2013) affirms the long-term association between πορφύρεος and the sea throughout archaic and early classical poetry (134).

⁸⁴ Heraclitus, DK 22b12.

⁸⁵ A history of this prop and its material reconfigurations on the modern stage is still needed. Modern directors sometimes suppress it (as did Ariane Mnouchkine in her historical production of the *Oresteia* at the Théâtre du Soleil, Vincennes, 1990-1992); or they privilege only one aspect of this proteiform object (the net for Peter Hall, London, Olivier Theatre, 1981 and Epidaurus, 1982; a long red piece of cloth for Olivier Py, *L'Orestie d'Eschyle*, Théâtre de l'Odéon, Paris, 2008). Others reinvent the meaning of the path of cloth in a personal way: Peter Stein (1994, Moscow) staged a mound of marron shirts symbolizing the victims of war; Katie Mitchell (London, 1999) replaced the purple path with 'a long blasphemous patchwork of the little dresses that had once belonged to Iphigenia' (Paul Taylor, *Monday Review*, December 6, 1999, 10). These are powerful reinterpretations of the original object, yet they also (inevitably) reduce its extraordinary versatile identity. In a TV miniseries entitled *Helen of Troy* (John Kent Harrison, 2003, Universal Home Entertainment), Aeschylus' net cloth makes an unexpected appearance: the film director had her Clytemnestra travel to Troy to take her revenge against Agamemnon. She throws a net on him while he is bathing in a pool of the palace of Priam.

⁸⁶ Clark 2015 (95), who refers to Kosslyn et al. 1995; Ganis et al. 2004.

⁸⁷ Starr 2013 (75) draws on this to develop crucial aspects of her aesthetic theory.

⁸⁸ Taplin 1978 (122-139).

⁸⁹ Starr 2013 (75).

⁹⁰ As when Orestes recalls the ‘embroidered net’ of Clytemnestra when put on trial at the Aeropagus, *Eum.* 460.

⁹¹ See for example Kovacz, in Roisman 2014 (952).