Penultimate Text.

Goosebumps, Shivers, Visualization, and Embodied Resonance in the Reading Experience: *The God of Small Things*

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Abstract: This article contributes to studies of the heuristic, metacognitive and social values of literary works by interrogating ways by which literary description can induce experiential involvement in the reading process through mobilizing what neuropsychologists call our "affective consciousness" (Vandekerckhove and Panksepp 2011: 2017): a form of pre-reflective reception that arises from bodily experience. Focusing upon Arundhati Roy's *The God of Small Things*, I propose a theoretical framework for interrogating the forms of priming, bias, and insight gained via these physical dimensions of reading. In particular, I examine a narrative technique I term "embodied anchors," by which Roy conveys her characters' experiences, and their interpretations of those experiences, through image-clusters that function both as metaphors and as physical cues, simultaneously affecting both "basic" and "moral" emotions (as differentiated by clinical psychologists Olatunji and Moll 2007). I analyze how these embodied prompts activate readers' preconscious modes perception, modify cognitive skills, and intensify the effects of reading by anchoring ideational content in readers' bodies, rendering abstract concepts physically tangible, thus providing alternative and parallel means of communicating and manipulating knowledge. This knowledge, I argue, can be integrated into readers' range of experiences in ways that parallel 'real-life' encounters, potentially facilitating profound learning.
Key Words: embodied cognition, embodied anchors, affective consciousness, mental imagery, cognitive literary criticism, Arundhati Roy.

This article contributes to studies of the heuristic, metacognitive and social values of fictional works by interrogating ways by which literary description can induce experiential involvement in the reading process through mobilizing what neuropsychologists call our "affective consciousness" (Vandekerckhove and Panksepp 2011: 2017), a form of pre-

reflective reception that arises from bodily experience. A volume of research has recently been devoted to the production of "mental imagery" during reading. The term is somewhat confusing because it does not merely denote visual or indeed cerebral representations but rather a range of multimodal sensory responses that may arise while reading. These responses may include and often combine our five senses (sight, hearing, smell, taste, and touch), interoceptive sensations (such as pain or hunger), proprioceptive sensations (balance, limb and organ position), and/or motor/kinesthetic functions (movement, effort, acceleration; see Kuzmičova 2014: 275-276). Despite variations in susceptibility, all readers experience some degree of mental imagery some of the time; it is an involuntary byproduct of engaging with words (Sadoski and Paivio 2001: 74). So how exactly do words on a page translate into, or induce, physical effects in the reader? What role do these effects play both in immersing the reader in a fictional world and in creating connections between that world and the reader's "real world"? To what extent is the control exerted by the authorial text enacted or challenged by readers' private reading-experiences? And what may readers learn through this form of engagement?

To begin to address these questions, I propose to look closely at a fictional text that makes rich use of multimodal (mental) imagery, and to interrogate the means by which it may affect readers, primarily by inviting "motor resonance," elaborated upon below.[1] To supplement my own analysis, I draw upon the work of other literary critics and philosophers, data provided by laboratory-experiments conducted by cognitive and developmental psychologists and by neurologists, and some qualitative research such as Laura Otis's 2014 study based on extensive interviews with scientists, novelists, poets, artists, scholars, designers, and other creative professionals to assess self-reported experiences of reading fiction. Two qualifications attend this method: first, it must be acknowledged at the outset that, while responses to a text are never uniform, it is both possible and productive to elucidate a range of responses that are likely to emerge if a reader is attentive. Second, the focus of this article is primarily the domain of preconscious affective responses. This is not to say that affective stimuli are sufficient in order to address every facet of the literary experience. To the contrary, while visceral engagement underlies, grounds, and sometimes challenges our reflective capacities, other levels of meaning-

[1] Resonance occurs when an object or system becomes driven by another system or forces to oscillate with greater amplitude. This may often lead to the internal replication of observed action through bodily mechanisms that do not require conscious thought or reflection (Gallese, Keysers and Rizzolati 2004: 397). Whether motor-resonance involves "simulation" is still much debated. See Gallagher 2012.

making require conscious, inferential, contextual and theoretical know-how to be decoded or indeed generated. Moreover, affective phenomena do not always signal readily available meanings. Bodily attunement to self and to others is not automatic; it too requires conscious interpretation since confusion, denial, repression and confabulation are often stronger than physical evidence of emotion. For instance, one may be flustered without quite knowing why at first, and then also misinterpret the cause and its implications. At stake here is the understanding that humans have evolved multiple forms of perceptual apparatus and, if we seek to better understand these, we ought to try to account for each of them as best we can.

This is one of the areas to which cognitive literary studies may best contribute: enriching and extending philosophical and scientific investigations of mind. As Joel Krueger has recently asserted, literature not only reflects upon the uses of various forms of perception but also constitutes in itself just such a "tool" (2014: 165) by activating different registers of comprehension that operate simultaneously to produce a multimodal experiential process. In this article I am primarily concerned with a particular aspect of this conglomerate experience, that of affective engagement. The claim I advance is that affective prompts constitute an important channel through which author, text and readers interact, and this aspect of literary experiences warrants further investigation.[2]

I have chosen for the task at hand Arundhati Roy's semi-autobiographical novel *The God of Small Things*, winner of the 1997 Booker Prize. Roy's novel features a series of images that form clusters of meaning through which the author condenses various levels of significance. Each of Roy's image-clusters combines abstract metaphoric concepts with a direct appeal to readers' bodies. My analysis suggests that by accessing and arousing sensory modes of reception and perception, Roy anchors ideational content in her readers' bodies, rendering the moral codes of her text physically tangible. Anatomizing examples of this narrative strategy in light of recent studies of motor-resonance and the emotional and pro-social effects of reading, I elucidate how such sensorimotor cues enhance the vividness of immersion in the text, infiltrate readers' preconscious and subconscious levels of understanding, and influence thought processes, partly subliminally.

My use of the word "anchor" both includes and extends previous uses of the term in cognitive analyses. Edwin Hutchins described "anchors" (1995, 2005) as

[2] Among other cognitive literary critics, some of whom feature in this special issue, I acknowledge recent work by Marco Caracciolo, who has analyzed how manipulation of a narrative's "quasi-musical, rhythmic qualities" can lead to "kinesthetic feelings" (2014: 51); Anežka Kuzmičová (2012) who approached the mechanism of embodied resonance at the root of readers' feeling of presence or immersion; and Guillemette Bolens (2012) who studies characters' gestures, suggesting that readers' bodily involvement in narrative could stimulate the production of interpretive and thematic meanings.

material objects that compress complex blends, so that conceptual structures are "offloaded." He gives the example of a clock, for instance, as allowing the trained user an instantaneous grasp of the phenomenon of the passage of time (Hutchins 2005: 1571). This notion of "anchor" feeds into my use of the term, yet the anchors I discuss here do not have inherent or universal meanings (such as the passage of time) – their significance accrues during the tale, and in relation to the narrative. Thus, the red plastic wristwatch in the novel does not tell the time in the regular sense; it is a child's cheap accessory that always indicates ten-to-two. Instead of assisting the child-protagonist to understand time's progression, it becomes one of the objects in the novel that represent her experience of time stopping due to the traumatic events the story recounts. Thus, while this "anchor" does function, in Hutchin's sense, as a conceptual blend, the blend is unique to this storyworld, emerging through context-bound experience that joins characters and readers. The term "anchor" has indeed been used by Barbara Dancygier, who theorizes "narrative anchors" (2007) in the form of objects that help the reader construct major aspects in the story. Such anchors, she explains, "are not simply objects (like props) – they allow the story to achieve its coherence and meaning" (2016: 32). This meaning of "anchor" is integrated in my use of the term, and is further developed in order to unpack the embodied dimensions of such anchors, and the ways they influence sense-making through bodily resonance. The anchors in Roy's book both function as metonymic devices that signal elements in the story and, importantly, coopt readers' bodies in ways I analyze in detail below. Clearly, not all readers are equally susceptible to such prompts; the human affective spectrum is wide. Moreover, our natural or adopted dispositions (ranging from eagerly sympathetic to doggedly cynical) intervene in reading processes, as does the extent of our literary training and repertoire. Individual identities are of course influenced by specificities of historical context, gender, ethnicity, education, economic status, and physical (dis)abilities; nevertheless, all humans have bodies, and share most of their neuronal and affective schemata with the rest of the species. These bodies are crucial to the ways we communicate with one another.

Narrative tales can utilize this form of communication to a far greater degree than is often credited, and impart valuable knowledge about how others feel not only by telling of such feelings but by causing readers to reproduce facets of those feelings. As argued below , readers apprehend and process these feelings both through

neuronal activity and through affective responsiveness. By virtue of our shared physiques, a measure of these feelings is then incorporated into readers' lived-experience: not as anecdotal details but as sense-felt and sense-verified knowledge. Reading thus engenders learning of the same kind people gain by real-life experiences. Whether people then proceed to fully acknowledge this is beyond the control of the author; but unless they withdrew by ceasing to read, they will not have been able to entirely avert affective engagement with, and indeed participation in, the text. What follows substantiates how.

1. Eden = Unitary Existence

The God of Small Things, set in the Southern Indian state of Kerala, addresses two narrative strands. The first strand begins in 1969, on the day eight-year-old twins Rahel and Esthappen travel to Cochin airport with their mother Ammu, her brother Chacko, and their great aunt Baby Kochamma. The following two weeks end in devastation for all involved. Soon afterward the twins are separated from each other and from their mother; the family disperses. The second narrative strand takes place twenty-three years later, when Rahel, aged 31, returns to the family house to be reunited with her brother. When, on the first page of the novel, Rahel returns, it is a day in June. Following the monsoons, "the countryside turns an immodest green. Boundaries blur as tapioca fences take root and bloom. […] Pepper vines snake up electric poles," and the "wild overgrown garden" surrounding Rahel's family's once-imposing house is "full of the whisper and scurry of small lives. In its undergrowth a rat snake rub[s] itself against a glistening pole" (1). The evocation of an Edenic setting is unmistakable, and the references to a snaking plant and a rat snake suggest that, if readers are to expect a narrative framework analogous to the biblical tale, temptation and transgression are to follow. The sexually charged landscape further prepares for some "immodest" blurring of "boundaries." And indeed, in this novel, a single family "br[eaks] the rules" (31) and is consequently cast out of Eden into a world of suffering and death.

The "crime" of disobedience committed in Eden — the act of eating from the Tree of Knowledge — is usually interpreted as symbolizing secret, esoteric and/or sexual knowledge and the boundaries these impose. Accordingly, the Fall of the family in the novel is brought about by an illicit love-affair between Ammu, a Syrian-Orthodox Christian upper-caste woman, and Velutha, a "Pravan," a man of the lowest Hindu caste of "untouchables." The "blurring" of religious and social boundaries, the "immodest" love and

the sexual desire, ostensibly lead them to ruin. However, Roy's novel challenges the oppressive framework of the Eden myth. Continuing the tradition of Blake's poem "A Poison Tree" (1794), Roy presents the biblical prohibition itself, rather than violation of it, as the cause of evil. The implications of this stance are many, and the so-called "Love Laws" (33) and their attendant psychological, ethical, social, and political repercussions in the novel have generated some excellent scholarly work (see Thormann 2003; Outka 2011; Basu 2014). Therefore, instead of focusing upon the tragic love between Ammu and Velutha, the Romeo and Juliet of Kerala, and the explicit treatment of sensuality and sexuality their romance affords, I will focus upon Ammu's children, Rahel and Estha, through whom Roy explores the advantages of other forms of bodily receptiveness. The twins, like their mother, we are told, also "tampered with the laws that lay down who should be loved and how" (31), and it is through them, just as much as through their mother, that Roy draws readers into the very processes by which allegedly transgressive knowledge is acquired, causing readers to participate in the crimes of blurring the boundaries of knowledge and of love.

Early in the novel, the innocent time before the family's Fall is recalled:

> In those early amorphous years [. . .] Esthappen and Rahel thought of themselves together as We, and separately, individually, as We or Us. As though they were a rare breed of Siamese twins, physically separate but with joint identities.
>
> Now, years later, Rahel has a memory of waking up one night, giggling at Estha's funny dream.
>
> She has other memories too that she has no right to have.
>
> She remembers, for instance (though she hadn't been there), what the Orangedrink Lemondrink Man did to Estha in Abhilash Talkies. She remembers the taste of the tomato sandwiches – Estha's sandwiches, that Estha ate – on the Madras Mail to Madras.
>
> Anyway, now she thinks of Estha and Rahel as Them, because separately, the two of them are no longer what They were or ever thought They'd be.
> Ever. (2-3)

How are readers to interpret the twins' kinesthetic telepathy and their experience of having a "single Siamese soul" (41)? Stories about siblings, and especially twins, are often allegories of a single person — two sides of one individual, or two possible life-paths that individual

could take. Moreover, conjuring the ancient symbol of the circle of life by describing them as "two-egg twins" (2) ties into Roy's redeployment of religious iconography, suggesting the twins are, at least in part, allegorical figures: male and female, yin and yang; their simultaneous conception an act of miraculous divine creation.[3] And yet, the reading I will be offering here suggests that in order to tune into the twins' form of receptiveness, readers do not need to believe in some magical transparency available only to fictional characters but, rather, to identify through them a primal mode of perception and communication, foundational to their own "cognitive scaffolding," to borrow Andy Clark's term (1998: 274). Roy's descriptions of varieties of bodily attunement in her novel form a counter-narrative that undermines the crippling legacies of the ascetic traditions merged with the strict Syrian-Christian beliefs that the Kochamma family uphold, and rejects the value-systems that make the twins feel their sense-rich symbiosis is uncanny and unseemly, a transgressive blurring of boundaries. The novel venerates in their stead fallible, imperfect and endlessly expressive human bodies.

Of course, countercurrents to the subordination of the body go back, at least, to Hellenistic culture, on which Kierkegaard and Nietzsche famously drew in the nineteenth century to challenge the body-mind dualism and explore the individual self beyond its capacity to think. Heidegger's concept of *Dasein*, the unitary phenomenon of being-in-the-world, further attempted to overcome a mind-body division, conceiving the self as a vital, involved and holistic entity. But since the 1990s, when a constellation of technological, scientific and theoretical breakthroughs led to "The Cognitive Turn" (Hart and McConachie 2006), evidence has steadily been amassing to support the claim that the body and brain are inextricably linked: mind is the product of both. All human processes of perception and response are necessarily a matter of coalition between neural activity and an intricate network of peripheral nervous system pathways that extend all over our bodies (Damasio and Meyer 2008: 168). Moreover, "[b]odily behaviour, expression, and action are essential to (and not merely contingent vehicles of) some basic forms of consciousness. Mental states do not simply serve to explain behaviour; rather, some mental states are directly apprehended in the bodily expressions of people whose mental states they are" (Gallagher and Zahavi 2008: 148).

[3] The egg is, of course, an ancient symbol of fertility and creation, traditionally associated with both the Passover ceremony in Judaism and the Easter celebrations in Christianity. Readers are reminded of the connections between nature and culture, biology and myth.

Although Roy's novel predates much of the research that underlies such claims, it demonstrates an intuitive awareness of the centrality of bodily sensations to human understanding. Her child-protagonists' unalloyed experiential awareness and acute body-consciousness, free as yet of prescriptive taboos, is presented throughout the novel as a form of ignorance analogous to that of Adam and Eve's prelapsarian naiveté. Until the age of eight, relative neglect allows Rahel and Estha to remain untamed and free of prejudices; any and all information is potentially interesting to them. When the family car stops at a railway crossing, Rahel notices a busload of pilgrims, peering out of windows above "evenly spaced vomit streaks." She wonders "what caused the bald pilgrims to vomit so uniformly, and whether they had vomited together in a single well-orchestrated heave (to music perhaps, to the rhythm of a bhajan), or separately, one at a time" (61). Rahel's unabashed interest in bodily functions, and her trust in the possibility of synchronized reflexes, is revealing. So is the absence of disgust or fear at the sight of "a leper with soiled bandages" begging at the car-window. Estha meanwhile notices "the level-crossing lunatic" (62), and that "the hair on his head was curly grey, the hair in his windy armless armpits was wispy black, and the hair in his crotch was black and springy. One man with three kinds of hair. Estha wondered how that could be. He tried to think of whom to ask" (64). The children's inquisitiveness — inhibited only by a vague sense of adult disapproval — constitutes a kind of availability to knowledge. Their sensitivity to the nuanced changes in their own and other people's posture, breathing, gestures, and tone of voice allows them to differentiate between outward show and inner turmoil, studied appearances and genuine emotion.[4] Roy thus effects a reversal of the traditional interpretation of the Edenic transgression: it is not that Adam and Eve were blind to reality until the fruit propelled them into better seeing, but rather that they were allowed to enjoy embodied receptiveness until they ingested the fruit, an act that caused them to cover themselves, beginning the history of shame. In accordance with the biblical framework, the twins' receptiveness is brutally quashed; they are forced to cover themselves. One of the tragedies of the novel, in addition to more obvious ones, is their Fall from their original state. Nonetheless, Roy's narrative celebrates the feeling body and its unruly desires, seeing it not as an encumbrance upon thought but as a vehicle to knowledge and even salvation. It is not by chance that, at this

[4] Discussion of this theme is beyond the scope of this article. It should be noted, however, that such bodily attunement is learned through repeated experience of trying to interpret such information. Humans are predisposed to take interest in certain sorts of top-heavy spatial arrangements, but we need the intense exposure to faces for this to become our alertness to human facial expressions. See Barrett's summary of the research in *Beyond the Brain* (2011: 28-32).

same level crossing, Rahel's keen eyes pick out in the crowd the familiar gait of beloved Velutha. Although Estha adeptly causes her to understand that circumstances require her to deny this observation so as to protect Velutha, readers are nonetheless alerted again and again to Rahel's abilities of sight and insight. Whether or not Roy's characters may hope to regain Eden, or their prelapsarian capacity for (in)sight, Roy does not definitively determine. But her novel does urge her readers to cultivate the very forms of receptiveness her characters are forced to repress.

II. Cluster-Cues and Embodied Anchors

Roy entices readers to become complicit in this "transgression" by creating image-clusters. I term these "cluster-cues" because these vivid metaphors function as "embodied anchors": that is, prompts that condense multiple levels of significance through being anchored in sensorimotor stimuli that co-opt readers' affective capacities. Roy's trust in and celebration of the body is thus interwoven into the very structure of her narrative. For instance, readers are introduced to the smell of roses long before we can guess what this odor will come to mean in the novel. At each iteration in the narrative, the smell leitmotif accrues layers of meaning, not merely through the cumulative plot-connections made in the text but by stimulating readers' olfactory sensibilities. Similarly, we are invited to feel the goosebumps on Velutha's wrists, where the handcuffs touch his skin (31), and to recall a "sour metal smell" like "steel bus rails" before we understand the connection between the two smells. However, when these seemingly incongruous smell-cues (roses and metal) come together for the protagonists in one moment of awful coincidence, the traumatic experience of violence is conveyed to readers through their unexpected meshing. This nebulous multisensory fusion, created in a child's mind at the moment a beloved person's handcuffed arms ooze blood, is made so vivid and penetrating that readers can conjure its smell: "Sicksweet. Like old roses on a breeze."

Not every reader will respond to this cue with full force; not every reader's recollection or simulation of the scent of roses will be identical; but most readers' affective schemata will be activated. Recent experiments have shown that comprehension of linguistic material stimulates somatotopic activation in the premotor cortex. This means that the same neural circuits recruited for action are also activated when we engage with language, although not necessarily in an identical fashion (Barsalau and Weimar-Hastings 2005; Gallese and Lakoff 2005). While Roy's narrative continuously boosts sensorimotor resonance toward the threshold of consciousness, this resonance need not become conscious

in order to influence readers; its presence is made manifest in subcortical regions of the brain that function without recruiting conscious thoughts, and in sensory sites that both apprehend and store feelings (and memories) throughout the body-proper. Such forms of arousal are registered in BOLD (blood-oxygen-level-dependency) signals (Phillips et al. 2004). Embodied responses are regularly moderated, adapted, revised or rejected once consciously considered, but their initial occurrence is involuntary, preceding consciousness and often bypassing it altogether (Bower and Gallagher 2013; Damasio 1999). This does not, however, diminish their influence.

By "blurring the boundaries" between plant and human, pleasant and unpleasant odors, Roy reinforces the anti-Edenic theme of the text, further emphasizing the injustices that culminate in the excessive violence perpetrated against Velutha. Summoning smell stimuli proves a particularly effective literary device in this context: it replicates one of our most powerful biological predispositions. Psychologists have found that interpersonal acts of injustice — that is, actions performed by one person that result in another person feeling unfairly treated — trigger emotions such as anger and frustration, and also "moral disgust": an emotion related to our basic disgust-reflex, which is elicited by appraisals of contamination, impurity, or potential degradation (Olatunji et al. 2007; Marzillier & Davey, 2004; Rozin, Haidt, & McCauley, 1993). I have written elsewhere about disgust-functions in literary experience (Rokotnitz 2010); for the present argument it is important to note that socio-moral disgust has been shown to intensify taste and smell reactions to gustatory and olfactory stimuli, suggesting that "violations of dignity and respect can trigger an evolutionary based reaction that activates a human alarm system, warning individuals of impending threats" (Skarlicki et al. 2013: 853). Importantly, this applies to both victims and third party observers.

In turn, Roy's text, by couching social and moral violations in odor-specific imagery, evokes (and may well induce in some readers) the very physiological responses that the 'real-life' experience of injustice induces (Eisenberger & Lieberman 2004). Thus, the narrative plotline that traces "ways of breaking men"(6), traversing social, political and quite literal dimensions, is encapsulated in the children's experience as a specific smell, anchoring a complex network of ideas in a physical referent. For readers, this smell-cue, or 'embodied anchor,' may subliminally prompt disgust-mechanisms which alert them to physical violation and/or injustice, thus involving readers' own pre-conscious bodily reflexes in their reading experience. Furthermore, it may embed a new smell-definition in the reader's repertoire. When a reader next smells roses, he or she may well recall this

scene. Roy's cluster thus also functions as a mnemonic device that, on future occasions, may remind readers of the lessons Roy's novel aims to inculcate.

This smell-cue is one of a series of conglomerate, sensuous stimuli Roy creates. The exact phenomenology of the feelings these induce will vary between readers, but few are likely to be entirely resistant to their cumulative effects. The notion of total defeat, a culmination of multiple influences is, for instance, condensed into the soggy texture and taste of the aforementioned tomato sandwiches, eliciting an affectively charged sensation. Other examples include fingernails painted red, a child's sunglasses, and banana jam. These cluster-cues cement together constellations of meanings readily retrievable by readers at each instance of their iteration, creating a shorthand in a language of Roy's invention, which readers and characters share by virtue of having the same somatosensory apparatus.[5]

III. Test Case: Pappachi's Moth

One of the most evocative multisensory embodied anchor-cues in the novel is "Papacchi's Moth." Rahel and Estha's grandfather was an aspiring "Imperial Entomologist" (49). One night, a moth with "unusually dense dorsal tufts" falls into his drink. Pappachi immediately recognizes an opportunity for "taxonomic attention" and "fame" but the moth is identified by senior specialists as merely "a slightly unusual race of a well-known species" (41). The multiple ironies implicit in this statement reverberate throughout the novel, accentuating the futility of Pappachi's attempts to associate with the British Colonial class, and the absurdity of trying to classify humans in taxonomically and racially discreet categories. For Pappachi, however, the moth exacerbates his sense of frustration and disappointment. When another man is credited with discovering the same moth, and achieves the fame Pappachi was denied, Pappachi's fury provides an excuse for his abuse of alcohol, of his wife, and of his children. The moth's "pernicious ghost – grey, furry, and with unusually dense dorsal tufts" is said to "haunt[…] every house he ever lived in. It tormented him and his children and his children's children" (49).

This once again ostentatiously biblical turn of phrase may suggest the characters' half-belief in fate or divine intervention. Either way, Roy acknowledges that, as psychologists know well, resentments and violence often pass from one generation to the

[5] Some psychologists have suggested that embodied metaphors are understood by drawing on bodily imagery or by running unconscious embodied simulations (Gibbs and Matlock 2008) but scientists are still grappling with means of testing this hypothesis. For now, as Caracciolo states, the cognitive linguistic approach can make important first steps toward "embodying narrative discourse" (2014: 56), leading, we hope, to productive collaborations that tackle such questions.

next, so that victims of violence may themselves become violent. Ammu does not beat her children. She is fiercely protective of them. But she perpetuates her father's legacy by being so preoccupied with her own fears and frustrations that she sometimes fails to be attentive to her children. This legacy becomes a physical presence encapsulated by the moth cluster-cue.

Here is the instance of its first iteration: at the cinema in Cochin, Estha is molested by the drinks vendor. Due to their telepathic connectivity, Rahel becomes aware of the incident and shares in its traumatic effects. Minutes later, Ammu, who cannot yet know what happened, greets the offending man with friendly politeness. Her inattention to her children's agitation is experienced, momentarily, as insensitivity. When Ammu says the man was "surprisingly sweet with Estha," Rahel blurts "So why don't you marry him then?" (113). Ammu's status as divorced, single mother in India in 1969 is only slightly less stigmatized than leprosy. This remark cuts deep; the result is catastrophic:

> Time stopped on the red staircase. Estha stopped. Baby Kochamma stopped. 'Rahel,' Ammu said.
>
> Rahel froze. She was desperately sorry for what she had said. She didn't know where these words came from. She didn't know she had them in her. But they were out now, and wouldn't go back in.
>
> […] 'Rahel,' Ammu said. 'Do you realise what you have just done?' Frightened eyes […] looked back at Ammu.
>
> […] 'What?' Rahel said in the smallest voice she had.
>
> […] 'When you hurt people, they begin to love you less. That's what careless words do. They make people love you a little less.'
>
> A cold moth with unusually dense dorsal tufts landed lightly on Rahel's heart. Where its icy legs touched her, she got goosebumps. Six goosebumps on her careless heart.
>
> A little less her Ammu loved her.
>
> (113 ibid).

Once again, multiple ironies co-exist in Roy's text. Ammu's attempt to reprimand her daughter for blurting out "careless words" in a moment of inchoate resentment, is expressed in such "careless words," born of her own inchoate frustrations, that she unwittingly conjures the ghost of her father's moth, inviting its vile legs to land upon little Rahel's heart.

It becomes lodged there. From this moment, at every turn, when she slips, or even anticipates the possibility of error, Rahel is haunted by the prospect of being loved less. This episode does not determine everything that happens next, since so many contingencies factor into later developments, but it constitutes a brutal silencing, far surpassing any punishment Ammu intended, and preventing the twins from ever telling of Estha's abuse. Instead, anxiety is instilled regarding their mother's love and, by extension, their own worth. They cannot know that the vendor's suggestion that he may come to visit is an empty threat, or that Ammu's love is not so easily stifled. Their experience is one of urgent and perpetual risk.

Rahel's sense of regret, loss, physical violation, and helplessness are all fused in the cluster-cue of the moth. While individual readers may have had any number of personal associations with moths before they encountered Roy's specific cluster-cue, the image of "Pappachi's Moth" is evoked within its contextual embedding in the narrative, which largely conditions readers to find it repulsive. Humans are predisposed to emotional contagion (Jeannerod 2006: 147), and tend toward affective congruence (Meltzoff and Moore 1983: 707). Even though the collected references that comprise this cluster-cue are specific to the internal associations of the fictional narrative, they can be shared with readers due to this combination of narrative embedding (which creates a priming context) and our shared sensorimotor schemata, which override almost all sociocultural barriers to direct communication.[6] We are all embodied, embedded, enactive and extended beings (Ward and Stapleton 2011).

How exactly does Roy imbue her moth with such power? The location of the event creates an analogy between the emplotment of the characters in the storyworld space (the stairs exiting the cinema) and the symbolic connotation of its effects – a descent, or fall from grace. But Roy does not rely solely on the reader detecting this metaphoric analogue: she replicates its physical correlates. Her moth-cue renders Rahel's dread palpable to readers through a variety of interlaced channels of communication:

(1) The quality of surprise. Before readers have recovered from Estha's traumatic incident, we are propelled into a new and equally unexpected episode of

[6] Human brains appear to process visual information in at least two parallel, largely independent streams: a dorsal pathway, which analyzes distances, dimensions, directions, and speeds, and a ventral one, which examines colors, textures, patterns, and shapes in a more holistic way. But "Visual/verbal and image/word fail as clear-cut dichotomies, since both visual imagery and verbal language can assume and share so many different forms" (Otis 2015: 509).

distress. Rahel's surprise at her own involuntary reactions and Ammu's surprise at her daughter's seemingly malicious remark, are replicated by the text's abrupt presentation of the event; the intensity of the moment is conveyed through its instantaneous bodily impact. Surprise recruits both characters' and readers' focused attention and instinctual survival antenna.

(2) Rahel's freezing on the stairs. As indicated above, when people observe others perform goal-directed movements, the motor and pre-motor areas of their cortices become activated, thus inducing a form of involuntary physical participation in the observed action. Neurologists term this "motor equivalence" (Gallese 2001: 47) or "motor resonance" (Zwaan and Taylor 2006; Marino et al 2011).[7] Motor resonance has been shown to operate also when people listen to (Tettamanti et al 2005) or read (Hauk et al. 2004) sentences referring to bodily movement (Aziz-Zadeh et al. 2006), and contributes to interpretation of the meanings of actions by stimulating the observer's own motor programmes. Roy's readers thus resonate (to varying degrees) with Rahel's movement on the stairs, her shock and sudden freezing, and her emotional distress, all conveyed through her paralysis. Indeed, theorist Anežka Kuzmičová argues that "presence" (the immersive quality of feeling one has physically entered the story-world) arises from a first-person, enactive process of sensorimotor resonance rather than from visualization from the perspective of a passive, third-person observer. "A higher degree of vividness is achieved when human bodily movement is rendered in the narrative" (2012: 24). By staging this event as an episode of arrested movement Roy heightens its affective force.

(3) The focus on Rahel's "frightened eyes" and "small voice," the familiar expressive codes of fear further contribute to the emotional thrust of the episode. These further accentuate embodied resonance and reinforce the correlation between motor and emotional experience. As cognitive neuropsychologists Bradford Z. Mahon and Alfonso Caramazza state: "The activation of the sensory and motor systems during conceptual processing serves to ground 'abstract' and

[7] Mimicry is defined as the tendency to synchronize affective expressions, vocalizations, postures, and movements with those of another person (Singer & Lamm 2009). Simulation, on Gallese's account, describes the internal replication of observed action through bodily mechanisms that do not require conscious thought or reflection, but rely upon a shared "brain-body system" (Gallese, Keysers, and Rizzolati 2004: 397). This process involves, but is by no means solely governed by, mirror neurons.

'symbolic' representations in the rich sensory and motor content that mediates our physical inter-action with the world" (2008: 68).

(4) Conjuring the moth and its "dorsal tufts" in terms of unwanted interaction. Individuals vary in their inclinations toward "object visualization (focused on shape, color, and texture) and spatial visualization (focused on distance, velocity, and direction of movement)" (Otis 2014: 505). Indeed, while some readers visualize the tale as they read, almost as if watching a movie-style image of the narrative description (and may indeed also be influenced by media-images from films, advertisements, or other books), others may not visualize it all. Laura Otis has found that readers sometimes construct personal representational tools such as associative diagrams, geometric shapes or architectural spaces that are not directly described by the text but constitute "a creative process" of response to it (Otis 2015: 516). Similarly, while visualization of the moth would seem to intensify the effect of the image, visualization is not essential to the cluster-cue, for the moth's image is not static. Even if readers do not form a clear mental representation of it in their mind's eye, its movement alerts motor-circuits by drawing attention to the rapid, alarming, and fluid situation. Moreover, the moth's descent mirrors the sinking feeling in one's stomach that often accompanies such a lurch. Further yet, the presence and movement of the image are intensified by physical contact with Rahel. When the moth's six thin legs are described as landing on Rahel, a shiver of disgust is likely induced by the prospect of the moth's touch, causing some readers to simulate Rahel's shudder, creating heightened somatosensory agitation. Indeed, touch has been shown to be a particularly powerful affective prompt due to its "double position in between proprioception and exteroception, link[ing] the body intimately to its environment" (Kuzmičová 2012: 39). The combined visual-tactile focus of the moth-cue, and the urgency conveyed by reference to transitive bodily movement, creates a particularly potent multimodal embodied anchor.

(5) Highlighting specific body-parts, thereby directing reader's attention to our shared physiological makeup. In the previous cue, goosebumps on Velutha's handcuffed wrists were evoked; in this cluster-cue it is Rahel's heart. Psychologists have shown that awareness of one's own heart activity is positively correlated with the intensity of emotional experience (Wiens, Mezzacappa, and Katkin 2000). Calling attention to Rahel's heart serves to further heighten the emotional impact of the episode. Moreover, the boundaries between a fluttering moth and a fluttering

heart are merged, pointing to a new form of symbiosis which is then, indeed, brought out further as the narrative progresses.

Roy's moth thus causes readers to resonate with Rahel's dread both through sympathizing with her predicament and through involuntary empathetic engagement with Roy's sense-rich formulation of that predicament. Furthermore, the moth-cue's unpleasant sensation is then repeated several times, its pernicious effects accumulating incrementally. Whenever Rahel's dread resurfaces, mention of the moth recurs, tracing the evolution of her affective conditioning. Through repeated instances of humiliation and dispossession, the surprise element of the cue is muted; the sensation of dread becomes customary. The appearances of the moth in the narrative cease to mark novelty and gradually form a recognizable pattern of destructive behavioral priming in Rahel's life.

IV. So What?

This article has primarily focused upon the potential effects upon readers of the authorial practice of correlating literary content and form, through close attention to Roy's narrative technique, which relies upon her readers' visceral engagement. I have examined how Roy reinforces the imaginative identification and sympathy mobilized by the emotional tale through the use of "cluster-cues" that function as "embodied anchors," which induce readers' resonance with significant aspects of the characters' experiences, rendering reading a form of active participation. This participation through resonance, I suggest, replicates parts of Rahel and Estha's forms of communication. Considered from this perspective, the twins' kinesthetic telepathy is less unusual than readers might initially have supposed, constituting an affirmation of the kinds of knowledge and communication we too can foster through our bodies, if only we permit such interchange.

I have thus aimed to show how experimental and developmental research allows us to better differentiate and understand the effects of reading fictions. Just as important, I have traced ways in which literary studies can feed scientific investigation by analyzing the means by which literature facilitates forms of affective, emotional and mental engagement that cannot (as yet) be replicated by laboratory experiments. Recent fMRI experiments have, for instance, scanned subjects reading specially doctored mini-narratives to assess how their brains react to different stories (Altman et. al. 2012). Much may be learned from such experiments about brain functions, but little is gleaned regarding readers' investment in an extended narrative. The conditions for the emergence of the kind of empathetic arousal

and learning I have discussed here are those created by such extended investment in a fictional story-world, and by interaction with the narrative devices through which it is conveyed to readers' conscious and preconscious perceptual apparatuses.

Radically countering the prevalent notion (often accepted as fact) that because we cannot see into another person's brain (at least while they are conscious) we are also barred from direct access to their mental states, the evidence presented here corroborates the phenomenological claim that we can directly access features of other people's minds via their expressions and behavior. No one is transparently available to decoding either by their own mind or by those of others. But a substantial portion of mental and emotional phenomena may be perceived through experiential involvement.[8]

Nonetheless, with regard to the scope of affective prompts in literary texts, some critics have argued that "few readers probably experience muscular activity and other vivid [effects of] motor imagery every time they read about [them]. If this were the case, the reading mind would be constantly overtaxed. To say that one's brain runs a simulation of X is not to say that one necessarily experiences X or a mental image thereof" (Kuzmičova 2014: 279). On the other hand, evidence indicates strongly that our brains have evolved to juggle multiple simultaneous forms of input and, since consciousness is not always involved in the process, simulations can regularly occur without inducing information-overload (if by "simulation" one means a preconscious bodily replication rather than a conscious, systematic, experiment). The analysis I have offered here suggests that it is just this physical resonance that brings the story to life. Our attraction to fictions lies, in no small measure, in their "taxing" qualities – their immersive pull. Roy's mastery of this attraction is exemplary. In addition to the many qualities of plot, characterization and argument, her cluster-cues of embodied anchors combine seemingly unrelated sensations, creating tension and sometimes dissonance between visual, aural, tactile and olfactory registers. This technique replicates the random coincidences of life, which bring together otherwise unrelated objects that induce an array of responses; recruits readers' attention to changes in the environment and to bodily modes of interaction; and moves us to think, to feel, and to employ our own imaginative creativity in order to fill in and flesh out the details suggested

[8] For an excellent disambiguation of the distinctions between proponents of Theory of Mind (ToM) of the Theory-Theory (TT) and/or Simulation-Theory (ST) varieties, and proponents of the Direct Perception (DP) model of social cognition and its phenomenological origins, see Krueger 2014. However, it must be emphasized that Krueger's analysis evinces, once again, that all these processes are concurrently existent and operational.

by the text. Readers are thus also alerted to their involvement in the interactive, interpretive process of reading, and its reciprocal dynamic.

I have thus addressed the main question posed at the opening of this article: how exactly do words on a page translate into, or induce, physical effects in the reader? I have also examined some of the roles such effects play both in immersing the reader in a fictional world and in creating connections between that world and the reader's "real-world," demonstrating that the effects of the authorial text depend in part but are not entirely subjugated to individual readers' personal propensities and private reading-experiences. Without presuming to have exhausted these research topics, I conclude by considering the question, "What may readers learn through this form of engagement?"

At this point, cultural contexts become instrumental. While some forms of reception are, as we have seen, innate and preconscious, interpretation of such embodied activity requires conscious attention, as the phenomenological tradition systematically elucidates: Heidegger termed this "attuned understanding"(1927/1996: 240); Bower and Gallagher term it "attentive attunement" (2013: 122). Attentive attunement not only facilitates acknowledgment and observation of affective phenomena, it alters perception by recruiting our interest. If such attention is directed at the reading experience, then the sensorimotor sensibilities on which this article has focused, which in themselves are modulated in relation to individual people's physical attributes, skills, and handicaps, also become inflected by a spectrum of individual life-circumstances and preferences, rendering the reading-experience all the more subjective. From this highly individual perspective, each reader is invited to contemplate his or her options: "one's environment affords many possibilities for action, but each has its affective price tag, and they are not all equally affordable" (Bower and Gallagher 2013: 122). Whether readers then use their reading as an existential springboard is another matter (and deserving of further research). What I have aimed to demonstrate in this article is that the affective triggers of sense-rich fiction do not require expert or even conscious attention to be made manifest. Literature can teach our bodies directly. Therefore, honing the skills by which we write, read, perform and view fictional works can improve the scope and subtlety of the skills with which we relate to ourselves and to others.

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