

## THINKING (WITH) THE BODY OF VITRUVIUS' *HOMO BENE FIGURATUS*

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### Introduction

Vitruvius' famous description of the *homo bene figuratus* possesses a slightly paradoxical nature. The description is meant to illuminate a fundamental but very abstract principle underlying the building of temples: symmetry or proportion.<sup>1</sup> For the purpose of illumination, an analogy is drawn between temples and the human body.<sup>2</sup> But even though the description serves an illustrative purpose, it does not at first sight appear to have a specifically illustrative nature since it largely consists of numerical fractions and proportional relations. Additionally, it seems quite difficult to tell what the *homo bene figuratus* actually looks like because the figure hardly possesses any individual features. And yet, the description inspired a rich reception of drawings during the Renaissance and later (of which Leonardo's version is certainly the most famous).<sup>3</sup> The passage even seems to have taken on a life of its own since in those drawings the *homo bene figuratus* is usually treated independently of its original purpose and remains unconnected with temples or other buildings. Apparently, the passage—somehow—has an easily comprehensible or even perhaps vivid quality, despite the fact that it mainly lists abstract numerical details.

The purpose of this article is to enquire into this immediately comprehensible and vivid side of the description and, by doing so, to put some insights from cognitive studies to the test. In recent years, it has been shown that our understanding is not a matter of the mind alone; rather, there is a strong connection and interdependence between body and mind which shapes the way we perceive, understand, and think. Since it is precisely the connection between body and mind in the figure's description that creates the vividness or illustrative force of the Vitruvian passage,<sup>4</sup> these insights may prove useful for analyzing the text; after all, it uses the description of a human body to effectively convey an abstract principle.

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1. Gros (1990), xxx, points out that Vitruvius uses *symmetria*, *proportio*, *commodulatio*, etc. without any systematic distinction. On the importance of the principle in general, see McEwen (2003), 195f.

2. On equating house with man in the Republic and the early Empire, especially its concomitant social and moralizing implications, cf. Nichols (2017), 83–129.

3. Examples are given in Wesenberg (2002), 358f., 363f., and Zöllner (2009), 147, 149. Interestingly, McEwen (2003), 157, states: 'Vitruvian man can hardly be called a how-to description: the text at the beginning of the third book is not meant to supply directions for putting together a male body.' As will be shown, however, this statement is only in part correct.

4. The term 'vividness' is, of course, tightly connected to the rhetorical tradition and the ancient concept of *enargeia* (on which see Manieri [1998], Otto [2009], Webb [2009], Zanker [1981]).

That way, we may acquire a more detailed or nuanced understanding of how the contradictory nature outlined above comes about.

In what follows, it will be argued that the description relies strongly on the recipient's knowledge of having a body and possessing a sensorimotor system to make the principles of proportion palpable and immediately comprehensible. In fact, the recipient's body plays a crucial role in thinking the body of the *homo bene figuratus*, and the means of conveying the latter are unobtrusive and inconspicuous. This will be shown in three parts: after a brief theoretical outline, the illustrative force of the text is examined successively in the two sections of the passage, the account of the proportion between the single constituents (in Vitruvius 3.1.2) and the account of the proportion between the constituents and the whole (in Vitruvius 3.1.3).

### Theoretical Outlines

Lately, literary studies have increasingly taken into account that mind and body are closely intertwined and that the way we think and perceive our surroundings is shaped and influenced by the body.<sup>5</sup> The ongoing interaction between mind and environment has been viewed from different angles: the mind may be described in a broad sense as 'embodied', it may also be conceived of as 'embedded' in its physical and further contexts, as 'extended' through the body into its surroundings, or as 'enactive', that is: engaged in constant interaction with the environment.<sup>6</sup>

Since we all have a body, we usually know intuitively what it feels like to be, stand, or sit somewhere, to move around, and to use our limbs to whatever purpose we have. The phenomenologist Maurice Merleau-Ponty points out that our body is never an object like other objects or positioned next to them in the same manner and describes this notion we usually have of our body in the following way:

If my arm is resting on the table, I will never think to say that it is *next to* the ashtray in the same way the ashtray is next to the telephone. The contour of my body is a border that ordinary spatial relations do not cross. This is because the body's parts relate to each other in a peculiar way: they are not laid out side by side, but rather envelop each other ... [M]y entire body is not for me an assemblage of organs juxtaposed in

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However, the term is used here in a broader sense to describe the effect of immediate comprehension or easy understandability of a passage.

5. For a general overview see Fingerhut, Hufendiek, and Wild (2013), 43–64, and Kukkonen and Caracciolo (2014) on the so-called 'first' and 'second generation' of cognitive studies.

6. On '4E cognition', cf. Fingerhut, Hufendiek, and Wild (2013), 83–91, Troscianko (2013), 182–6, and (2014), 22–9, and Noë (2004), 1–32, 36.

space. I hold my body as an indivisible possession and I know the possession of each of my limbs through a body schema [*un schéma corporel*] that envelops them all.<sup>7</sup>

And shortly later he adds:

When the word ‘here’ is applied to my body, it does not designate a determinate position in relation to other positions or in relation to external coordinates. It designates the installation of the first coordinates, the anchoring of the active body in an object, and the situation of the body confronted with its tasks.<sup>8</sup>

The body schema explains why we do not need much information or a detailed description to understand the spatial situation our body occupies:<sup>9</sup> most of us would, for example, know by instinct what it feels like to sit back in an armchair, to walk around in a room, or to kneel on the floor. In none of these situations do we need an explanation of where feet, shoulders, arms, or any other limbs are to be placed. The position is easily, even automatically comprehensible—in fact, we usually efface it from our conscious perception and do not pay attention to how it is conveyed or why we comprehend it so easily.<sup>10</sup>

Apart from the body schema, an equally important corollary from the inextricable connection of body and mind is our focus on action: we mainly perceive the world around us with respect to the possible ways of acting within it or making use of the items that surround us. As Terence Cave succinctly puts it:

This dynamic relation [sc. between body and mind] is often said to be ‘enactive’, that is to say that perception and cognition, rather than being defined as independent powers of the mind operating on the world, are entirely defined by their active and constantly updated engagement with the world.<sup>11</sup>

This means that our perception focuses on action or, vice versa, that the environment and things around us constantly appeal to our sensorimotor system and

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7. Merleau-Ponty (2012) [orig. 1945], 100f., emphasis in the original.

8. Merleau-Ponty (2012) [orig. 1945], 102f.

9. Merleau-Ponty (2012) [orig. 1945], 102, distinguished between ‘positional’ and ‘situational spatiality’.

10. Vitruvius’ text seems to have a general penchant for information that is implicitly given. The mastery of sensorimotor skills has some overlaps with the idea of ‘tacit knowledge’ which Cuomo (2016), 125–8, 139–43, traces in Vitruvius: both appear to come about automatically, the preconditions of both are difficult to express in words, and both seem to silently bridge gaps in a written text. In contrast to sensorimotor skills, however, the skills and knowledge Cuomo talks about (even though they are not clearly defined) appear to refer mostly to technical knowledge, its social implications, and its transmission.

11. Cave (2016), 28.

perceptual apparatus. We move around in a given environment and act automatically with(in) it without pausing to think how we should move our limbs. When we, for example, see somebody opening a can of soda, we immediately understand both, the object and the movement: we know what holding an unopened can full of liquid in our hands feels like and how its surface is smooth and hard; and most of all, we know by instinct what necessary adjustments our fingers have to make in order to open the can. What is not of primary importance in this situation and what we therefore do not think about immediately is the brand of soda or the color of the can.<sup>12</sup> (This focus on possible actions also explains why we usually have the impression that our perception is complete even when it is not.)

The focus on action is also the reason why simple bodily movements such as ‘open the can of soda’, ‘stand up’, or ‘sit down’ strongly appeal to our sensorimotor system and are a very effective means to create vividness. As Thor Grünbaum has shown, such verbs resonate within our perceptual apparatus whereas verbs that summarize action or give very detailed descriptions of movements do not create the same effect.<sup>13</sup> As Jonas Grethlein and Luuk Huitink put it: ‘the relevant verb phrases [i.e. here: of simple bodily movements] indicate schematically the various elements of the experience of agency as posited by the enactivist account, which relates pragmatic intentionality, bodily movement and perception to each other in systematic and unifying ways; we know what it is like to enter a room or pull up blinds in terms of the bodily poses and the change in visual input which comes with such actions, because it is at the level of such actions that we ourselves perceptually-enactively experience the world and know others to experience it’.<sup>14</sup>

These insights have proven fruitful in the analysis and interpretation of literature.<sup>15</sup> After all, our perceptual structures are constantly at work without us necessarily noticing it. This is also the case in literary works of art because evoking the experience of agency in language follows the same patterns of perception we use everywhere else, i.e., perceptions and imagination, as neuroscientific studies

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12. Troscianko (2013), 186. For another example see Grethlein and Huitink (2017), 4: ‘... when we look, for example, at a hammer, we do not so much perceive the object in all its details as rather perceive how we could use it, if we picked it up; and when we have visually assessed the hammer in terms of how it can serve our pragmatic intentions, we feel we have a complete “picture” of it, even if in reality we do not’; cf. also Huitink (2020), 192.

13. Grünbaum (2007), 300–3. Grünbaum (2007), 304, gives an example for a summarizing, general active verb (‘Dares won the fight against Entellus’) and for a detailed account of a bodily movement (‘Entellus’ right arm moved towards his left side in the direction of Dares’ right ear’). In comparison, the phrase ‘Entellus punched Dares’ contains a simple and immediately comprehensible bodily movement. The three categories obviously differ by degree; however, they are a useful tool to distinguish more or less vivid descriptions.

14. Grethlein and Huitink (2017), 6.

15. Cf. for example Grünbaum (2007); Bolens (2012); Troscianko (2013) and (2014); Cave (2016); Grethlein and Huitink (2017); Winter (2019); Grethlein (2021).

suggest, both use the same neuronal structures in the human brain.<sup>16</sup> As a consequence, our perceptual structures can be easily exploited in literature, which contributes enormously to the immediate comprehensibility of a text: appeals to our sensorimotor system create ‘an imaginative *experience* of perception’<sup>17</sup> and therefore render a text immediately understandable and imaginable.<sup>18</sup> After all, such appeals to the sensorimotor system do not require much reflection and hence do not have a strong distancing effect when used in a text.<sup>19</sup> It is easy to see how literary, especially narrative texts can effectively use these means not only to provide a vivid account of a story but to even create an immersive effect in which a recipient is transported into a fictional world. More descriptive, factual, or, in the case of Vitruvius’ *homo bene figuratus*, technical texts usually do not aim at such an immersive effect; however, they do, as will be shown, make use of the same strategies to render an abstract idea easily comprehensible.<sup>20</sup>

### Measuring the *homo bene figuratus*

In accordance with the definition of proportion in Vitruvius 3.1.1 (*proportio est ratae partis membrorum in omni opere totoque commodulatio*, ‘proportion consists in taking a fixed module, in each case, both for the parts of a building and for the whole’), the first part of the description of his *homo bene figuratus* consists mainly of measurements, individual *ratae partes* that are to be related to a whole, the *omne opus totumque*. But on closer inspection, it becomes obvious how the passage goes beyond the mere statement of numbers and acquires a more illustrative force by appealing to the recipient’s intimate knowledge of her own body. Instead of listing numbers and only stating proportional relations, the passage makes the proportions and fractions comprehensible or even palpable:<sup>21</sup>

corpus enim hominis ita natura composuit uti os capitis a mento ad frontem summam et radices imas capilli esset decimae partis, item manus pansa<sup>22</sup> ab articulo ad extremum medium digitum tantundem;

16. Grünbaum (2007), 309f.; Bolens (2012), 11–16, 37f.; Kuzmičová (2012), 29; Grethlein and Huitink (2017), 6.

17. Grethlein and Huitink (2017), 3 n.16, emphasis in the original.

18. Cave (2016), 28–30.

19. Grethlein (2021), 57, points out that elements drawing the reader’s attention to the text itself (such as very rare expressions or self-referential remarks) would disturb the text’s immediacy; therefore, transparency is a vital means of evoking vividness and producing an immersive effect on the reader.

20. This is why it is more appropriate to talk about the ‘illustrative quality’ and ‘immediate comprehensibility’ of these texts rather than about ‘immersion’.

21. The Latin text is taken from Gros’s Budé edition (1990), and the translation is adapted from Granger’s Loeb (1931).

22. On the reading *manus pansa* instead of the transmitted *manus palma*, see Gros (1990), 63.

caput a mento ad summum uerticem octauae, cum ceruicibus imis ab summo pectore ad imas radices capillorum sextae, <a medio pectore><sup>23</sup> ad summum uerticem quartae. ipsius autem oris altitudinis tertia est pars ab imo mento ad imas nares, nasum ab imis naribus ad finem medium superciliorum tantundem; ab ea fine ad imas radices capilli frons efficitur item tertiae partis. pes uero altitudinis corporis sextae, cubitus quartae, pectus item quartae. reliqua quoque membra suas habent commensus proportiones, quibus etiam antiqui pictores et statuarii nobiles usi magnas et infinitas laudes sunt adsecuti.

(Vitr. 3.1.2)

For Nature has so put together the human body that the face from the chin to the top of the forehead and the roots of the hair is a tenth part; also the open hand from the wrist to the top of the middle finger is as much; the head from the chin to the crown, an eighth part; from the top of the breast with the bottom of the neck to the roots of the hair, a sixth part; from the middle of the breast to the crown, a fourth part; a third part of the height of the face is from the bottom of the chin to the bottom of the nostrils; the nose from the bottom of the nostrils to the line between the brows, as much; from that line to the roots of the hair, the forehead is given as the third part. The foot is a sixth of the height of the body; the cubit a quarter, the breast also a quarter. The other limbs also have their own proportionate measurements. And by using these, ancient painters and famous sculptors have attained great and unbounded distinction.

Apparently, the most important information given in this passage is the fraction which is placed effectively at the end of each phrase or sentence: one tenth, one eighth, one sixth, one fourth (*decimae partis, octauae, sextae, quartae*), and so on. As each number is not a concrete unit of size but only a fixed part of a whole, a *rata pars*, its only informational value lies in the relation to that whole.<sup>24</sup> But the mathematical precision notwithstanding, an abstract number is hard to imagine, least of all vividly (or at least, it is for many people).

What is easier to understand and much more illuminating in the passage are the distances given between specific points on the body. In the description of the face, for example, four measuring points are used to divide it into three parts: from the bottom of the chin to the bottom of the nostrils, from there to the brows and on to the roots of the hair. Each of the three sections, Vitruvius says, is equal in size, one third of the face. Although it is not possible to tell how long the face actually is, the tripartite structure comes easily and clearly to the fore.

23. On the addition of *a medio pectore*, see Gros (1990), 64.

24. Gros (1990), 60. On Roman measurement styles, cf. also Riggsby (2016), 283–5.

This immediate comprehensibility of the passage is brought about by the body schema and the sensorimotor apparatus: after all, we all have a face and can intuitively locate the points mentioned above on our body and face. In addition, the description also has an activating and prompting effect because it uses what Mark Johnson calls an ‘image schema’, a ‘dynamic, recurring pattern of organism-environment interactions’,<sup>25</sup> that is: a spatial pattern which is based on human perception and experience. Such patterns enable us to ‘define the contours of our world and make it possible for us to make sense of, reason about, and act reliably within this world ... [I]mage schemas are precisely these basic structures of sensorimotor experience by which we encounter a world we can understand and act within’.<sup>26</sup> In Vitruvius’ passage, the schema applied is a ‘source-path-goal-schema’,<sup>27</sup> which consists of a starting point, a destination point, and the vector between them.

In Vitruvius 3.1.2, the ‘source-path-goal-schema’ is evoked by very unobtrusive means, namely the prepositions used.<sup>28</sup> They set an initial point (e.g., *a mento*, ‘from the chin’) and an endpoint (e.g., *ad frontem*, ‘to the forehead’) and at the same time prompt a directional movement between them (‘from–to’). As a result, the sentences gain an activating aspect because the prepositions sound like an exhortation to measure or retrace the path mentioned, ‘start here, stop there’, even though no explicit imperative is used.<sup>29</sup> Whenever the schema occurs, we mentally carry out these movements; and since every one of us has a body and knows where, for example, the chin and the top of the forehead are, the points and distances mentioned can be easily retraced on our own faces. The description appeals to the knowledge and bodily experience of the reader—the fact that we know our body ‘inside out’—and thereby makes the distances immediately understandable. That way, the abstract principle of proportion becomes palpable.

A short digression needs to be inserted here. What the text is not explicit about is the matter of perspective. So far, it has been assumed that the distances are perceived ‘from within’ and retraced on the recipient’s own body. But it may also be possible to perceive them from an outside position and trace the distances on somebody else’s body. The text is not specific about it but seems to allow for changing positions. We may imagine the distance ‘from the wrist of the hand

25. Johnson (2007), 136–46; cf. also Wege (2013), 92–8, 118–22.

26. Johnson (2007), 136. Johnson’s aim is, of course, to transfer such schemas—like metaphors—to other realms and to analyze the conceptual metaphors resulting from this transfer (Lakoff and Johnson [2003] [orig. 1980], 3–21, 272). But, as the definition shows, ‘image schemas’ are grounded in everyday experience and rely on the interaction between body and mind and the mind’s ongoing engagement with the (spatial) surroundings. In the case of the *homo bene figuratus*, they are applied to space and a body, not transferred to the realm of metaphor.

27. Johnson (2007), 142; cf. also Wege (2013), 127.

28. On prepositions as inconspicuous means of conveying spatial orientation and meaning, cf. Winter (2019), 403.

29. On the activating force of such a pattern, cf. Johnson (2007), 142. On imperatives in technical descriptions, cf. Roby (2016), 192–209; on Vitruvius, see especially 207f.

to the tip of the middle finger' easily because of the daily and familiar experience of looking down at our hands instead of 'feeling' the two points mentioned on our own hand; similarly, it may be as likely that one would retrace the distance 'from the middle of the breast to the crown' on somebody else's body rather than our own.

This ambiguity is comparable to a similarly ambiguous effect evoked by verbs that denote simple bodily movements. According to Grünbaum, we understand such verbs equally well in two ways: executing them ourselves and watching them being executed by somebody else. Therefore, Grünbaum assumes that the perspective is twofold, too, looking 'from inside' (as if we were executing the movement ourselves) and 'from outside' (like an onlooker), and cutting across this dichotomy.<sup>30</sup> The same phenomenon seems to be at work when it comes to the body schema: we may perceive the measure points 'from inside', on our own face, but also 'from outside', on somebody else's. Vitruvius' description does not determine the vantage point from which the distances are perceived. (Interestingly, though, the measure points are understood before the question is raised as to *how* they are understood.)

The openness of choice regarding the perspective helps to effect a smooth transition in the concluding lines of chapter 3.1.2:<sup>31</sup> 'And by using these, ancient painters and famous sculptors (*pictores et statuarii*) have attained great and unbounded distinction.' This is the first time that art is explicitly mentioned in the passage, and yet it seems to confirm an impression that has been silently at work all the time: that the *homo bene figuratus* is not a living human being but a work of art.

This impression is also enhanced by several other factors. The text is abstract insofar as it portrays a face but not a specific face. Additionally, the range Vitruvius' description covers reminds one more of a bust than of a complete body: what is actually mentioned are mainly head and chest, with a short remark about hands and feet and a general statement that the theory of *commensus* also holds true for all other limbs which are, however, omitted—but because of the body schema, the recipients know how and where these limbs need to be placed. It is not astonishing that we readily assume the *homo bene figuratus* to belong to the realm of art though this is never stated explicitly.

Furthermore, the beginning of the passage, Vitruvius 3.1.2, contributes to (or maybe also primes) the impression of being faced with a work of art: *corpus*

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30. Grünbaum (2007), 308–10. Cf. on the first- or third-person perspective also Bolens (2012), 37–9; Kuzmičová (2012), 29; Grethlein and Huitink (2017), 6 (especially n.34).

31. Scholars have felt the need to comment on his transition from human bodies to works of art: McEwen (2003), 196, points out that the 'canonic proportions' offered at the opening of book 3 are usually related to the Greek sculptor Polykleitos but the text does not mention any artist or artwork; rather, 'Vitruvius is not referring to a statue; he is referring to a man—one who is well-shaped (*bene figuratus*)' (for the reference to Polykleitos and other Hellenistic predecessors, see also Di Pasquale [2016], 52f.; Gros [1990], 61f.; and Anderson in this issue). As Gros (1990), 61, explains, this explicit reference to a man, instead of his representation in art, may possibly serve to justify architecture as 'natural'.



*hominis ita natura composuit* ('Nature has so put together the human body'). The personification *natura* along with the simple bodily movement of *composuit*, 'put together',<sup>32</sup> evokes the notion of someone standing somewhere and assembling items of a manageable size<sup>33</sup> that are laid out before themselves (even though the exact position within their environment is not clear and does not have to be made explicit to be immediately comprehensible).<sup>34</sup> It thus subliminally supports the idea of an artist or sculptor working on a bust or statue rather than the more abstract idea of nature as the principle of creation that brings forth a living and breathing human body.

As we have seen so far, the text uses very effective but rather unobtrusive means to make this abstract principle of proportion understandable: it appeals to the familiar notion of having a body and also conveys the procedure of composition implicitly by prompting the reader to put the *ratae partes* together.

### A Palm-sized Man

The second part of the description of the *homo bene figuratus* and also of the illustration of proportion in Vitruvius 3.1.3 consists of the appropriate measure between the single constituents and the whole. Here too, the enactive mind and appeals to the sensorimotor system play a crucial role in conveying proportion and making an abstract principle comprehensible. Most impressive in this regard is the following sentence:

namque si homo conlocatus fuerit supinus manibus et pedibus pansis circinique conlocatum centrum in umbilico eius, circumagendo rotundationem utrarumque manuum et pedum digiti linea tangentur.

(Vitr. 3.1.3)

For if a man lies on his back with hands and feet outspread, and the centre of a circle is placed on his navel, when the bent line of the circle is turned around,<sup>35</sup> his fingers and toes will be touched by the circumference.

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32. OLD s.v. *compono* 1 and 7.

33. A phenomenon similar to what is called 'manageable size' here is found in the basic unit of the *modulus*: 'Not only is the *modulus* normally (perhaps always) a concrete thing, it is a thing of a particular kind of size. It is never the smallest unit of a construction and rarely is it the largest ... This is a practical unit of measure' (Riggsby [2016], 288, emphasis in the original). Of course, *componere* can also be used with units of larger size but this would have to be indicated by an object or a more specific context.

34. The description of the figure and the analogy between temples and the human body is also concluded again with the act of *componere* in Vitr. 3.1.4 (*ergo si ita natura composuit corpus hominis ...*, 'Therefore if Nature has planned the human body so ...').

35. The phrase *circumagendo rotundationem* is difficult to translate. Granger (1931) renders the object *rotundationem* more concretely as 'when the circle is turned around', which omits the haptic quality conveyed in *rotundatio* (see below).

The position of the man lying on his back is immediately understandable because everybody knows what it feels like to lie on the floor with one's arms and legs stretched out. This example shows impressively how much information the reader infers silently exactly because of the intimacy with body and position: the floor is not mentioned explicitly here,<sup>36</sup> and, besides, it is not at all clear whether the man's hands are stretched out sideways or above the head or in whichever angle else they are to be imagined.<sup>37</sup> Nevertheless, the body's position is probably understood without any effort (even before we start thinking about the exact angle at which arms and legs must be).

A second element greatly enhances the easy comprehensibility of the scene: the use of the compasses. Again, we know from experience what compasses feel like, how they are shaped, what it feels like to hold them in our hands, and how we have to move our fingers to inscribe a circle with such an instrument.<sup>38</sup> The phrase *centrum circini conlocatum* activates the knowledge of what the spike of a pair of compasses feels like and how it must be placed (*conlocare*) on a surface—no more details are needed to improve the understanding. The movement of drawing is itself expressed in the ablative *circumagendo*, another verb that denotes a simple bodily motion,<sup>39</sup> prompting the knowledge of what 'turning a pair of compasses around in a circle' feels like when it is being executed. Additionally, the somewhat redundant accusative object *rotundationem* captures the most apparent and haptic aspect of the circle, namely its roundness. 'Turning around the bent line of the circumference' appeals to the sensorimotor system and elicits the knowledge of how to execute this movement with a compass.

As in Vitruvius 3.1.2, this is a compelling example for a scene which the recipient immediately understands because of the responses the text elicits in her sensorimotor system. This effect is even greater if we take into account that what is described here cannot be performed in reality. There is no compass in the world big enough to draw a circle around a grown-up man—and even if it were, it would be impossible to actually put such a tool to use. As McEwen puts it: 'Who, if anyone, is to hold the compass in this hypothetical situation ... Vitruvius does not say'.<sup>40</sup> The pair of compasses, their material, design, size, and most of all the way it is handled produce another, quite

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36. As McEwen (2003), 157, points out, Renaissance images always show the man standing.

37. Different drawings from the Renaissance illustrate this: Zöllner (2009), 149. Cf. also Gros (1990), 66f.

38. It does not matter much whether we are talking about modern compasses or, for example, a nail with a string: though the affordances of different types of compasses are different, the appeal to the way they are used is equally strong.

39. *OLD* s.v. *circumago* 1 and 2a.

40. McEwen (2003), 157. Riggsby (2016), 292–6, explains a similar phenomenon in his discussion of 'allometry' and the problem of transferring measurements from one realm to another. He refers to Vitr. 10.16.5, where Vitruvius states that it is possible to make a hole of an inch with a drill, but impossible to make a hole of half a foot—this 'would not even be conceivable' (*ne cogitandum quidem uidetur omnino*): Riggsby (2016), 295.

astonishing effect: they reduce the man lying on his back to a size at which the compasses function. It is as if we could take the man in our hand just because we can operate the compass with our hands; and the three-dimensional life-sized man suddenly turns into a two-dimensional small figure that can be encircled effortlessly.<sup>41</sup> (As in the preceding section of the passage, the description seems to subliminally turn the human body into an image or a representation—here a drawing instead of a bust or statue, thus indicating how the principles of art must be the same as the principles of nature.<sup>42</sup>) A single simple bodily movement, the drawing of a circle, easily conveys the abstract principle that all proportional constituents must be related to the whole.

## Conclusion

It has been shown that the slightly paradoxical nature of Vitruvius' *homo bene figuratus*—the rather abstract list of numerical fractions on one side and the easy comprehensibility of the figure on the other—can be more precisely described and explained with some insights from cognitive studies: appeals (even unobtrusive ones) to the recipient's body schema and sensorimotor system are used effectively to convey a notion of symmetry and proportion, a key constituent in *compositio* and Vitruvius' overall architectonic theory. This is how an abstract principle can be rendered easily understandable and an otherwise very technical text may be enriched with a surprisingly illustrative quality.

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41. Cf. McEwen (2003), 157, 160. The subsequent use of the square employs the same strategies as displayed above (Vitr. 3.1.3): *nam si a pedibus imis ad summum caput mensum erit eaque mensura relata fuerit ad manus pansas, inuenietur eadem latitudo uti altitudo* ('For if we measure from the sole of the foot to the top of the head, and apply the measure to the outstretched hands, the breadth will be found equal to the height'). Here, the 'source-path-goal-schema' ('from the sole of the foot to the top of the head') does not enumerate single constituents but, like the encirclement, captures the whole to which all constituent parts are related.

42. As Gros (1990), 61, points out, Vitruvius uses these references to nature to legitimize architecture.