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Something Vague

The Vanna Venturi House is a vaguely gray building. A simple Google or Instagram search produces several color photos of its exterior, which appears in varying tones of what one could call gray. A visit to the building, depending on the season or time of day, reveals similar gray-like colors. In a 2006 interview, Robert Venturi and Denise Scott Brown recounted how the color of the house was selected.[1] The original choice was "warm gray" – a hue that both Venturi and his mother liked. But after coming across Marcel Breuer's advice to avoid green as a house color, Venturi said he painted over the gray with a shade of green. Over the years, as the architects' ongoing desires to break the rules were tempered by aesthetic preference, the house was repainted more like its original color. Even though the house was at times perceived as *more gray*, the architects conceived of it as green. Thus one can say the house is not definitely gray because its hue lies somewhere on the spectrum between gray and green.

The uncertainty surrounding any building's color emphasizes a fundamental indeterminacy in communicating architectural qualities, such as tall proportions or round forms. To borrow from philosopher Nelson Goodman, a quality is "a class of things that resemble each other."[2] Goodman's definition makes the description of architectural qualities an interesting problem because there is difficulty in classifying things by shared perceptions. This is because discrepancies arise between the precise meanings of words, vision, and images, which in linguistics and philosophy is known as *vagueness*. While there are several contested theories of vagueness in these fields, the criteria developed by philosopher Rosanna Keefe are productive for architecture. Competing theories, like Terence Parsons's view that things are inherently vague or Timothy Williamson's position that vagueness arises from unavoidable ignorance, give architects no opportunities to instrumentalize vagueness to physically act on the world. For Keefe, vagueness arises from language, and something is vague when it demonstrates three characteristics: it is a borderline case, it has a fuzzy boundary, and it exhibits the sorites paradox.[3]

1. Denise Scott Brown and Robert Venturi. "My choice of colour for the Vanna Venturi House." Interview by Thomas Hughes, September 22/23, 2006, in *Web of Stories*, video, 2:14. https://www.webofstories.com/play/robert.venturi.and.denise.scott.brown/11.
2. Nelson Goodman, *The Structure of Appearance*, (Indianapolis: Bobbs-Merrill Co, 1966), 147.
3. See Rosanna Keefe, *Theories of Vagueness* (Cambridge: Cambridge University Press, 2000), 1–36.

The first, a borderline case, is a marginal condition within a category. For Keefe, these are instances where it is uncertain whether a category, like a color, applies. To demonstrate, let us take the color burgundy as an example of borderline red. It is not clearly true or false whether burgundy belongs to the class of all reds because it lies at the edge of the red spectrum. The color is a borderline case not for its own lack of specificity but because the limits of redness are indefinite. Adding new information, like a hexadecimal code, for example, does not determine whether burgundy is red or not red.

The second characteristic, a fuzzy boundary, is an ill-defined border used to divide groups. Similar to a borderline, it too relates to an edge condition. In Keefe's example, there is no sharp boundary dividing tall and not tall people, for the quality of tallness has a region of borderline cases. A grouping of tall people has a fuzzy boundary because it oscillates according to which method is used to assess a person's height. Whether a person is tall cannot be characterized by binary definitions – tall or not tall – because inconsistencies in measurement systems preclude clear judgments. Classifying architecture according to tallness creates similar uncertainties. For instance, the category of high-rise buildings has a fuzzy boundary because of differences in international codes. By Japanese standards, a high rise is defined as a building taller than 102 feet (31 meters), but according to the 2015 International Building Code, it has an occupiable floor higher than 75 feet (23 meters) above a fire access road.[4] There are several borderline cases, like Kazuyo Sejima's 98-foot (30-meter) tall Shibaura House, because the distinction between high-rise building and not high-rise building is unclear. Categories with fuzzy boundaries, or fringes, are best described by gradients because they cannot be drawn with hard edges.

The third characteristic, the sorites paradox, encompasses both borderline cases and fuzzy boundaries. Attributed to the ancient Greek logician Eubulides of Miletus, the sorites paradox problematizes the limit of a *heap* to describe the term's indefinite qualities. The paradox starts with two statements that we know a priori to be true: (1) that one million grains of sand make a heap, and (2) that one grain of sand does not make a heap. We are sure that the heap of one million grains of sand is still a heap after removing one grain or two or three. But by reduction ad infinitum, the remaining grain of sand is still a heap, paradoxically contradicting the second statement. Finding the exact number of grains at which a heap becomes a nonheap is impossible, not for lack of measurement, but because the word *heap* is imprecise. This fundamental imprecision of language is what renders *heap* and words like *small*, *tall*, and *gray* vague.

Following Keefe's criteria, the Vanna Venturi House is categorically a vaguely gray building. But there is uncertainty in categorizing buildings as gray, or as any color, because there are conflicting color models. Attempting to color-match the Vanna Venturi House exterior produces results like Gray Wisp (CC-670) at Benjamin Moore and Unusual Gray (SW 7059) at Sherwin Williams. Finding where gray ends in paint measurement systems is impossible, especially when considering seasonal variations or the discrepancies between printed fan decks and digital palettes.

Classifying buildings according to their apparent qualities frequently creates groups with fuzzy boundaries, for the extent of all objects belonging to a set is indefinite when there are several competing descriptive methods. The gradient between gray/not gray, small/not small, and tall/not tall is similar to the elasticity of fuzzy sets found in mathematics. Developed by mathematician Lotfi A. Zadeh in the mid 1960s, fuzzy set theory proposes that there is a gradual shift from an object's membership to its nonmembership in a set.[5] The boundaries of a fuzzy set can expand or contract, making the border that establishes an object's membership indefinite. Classical sets, on the other hand, have fixed divisions such that an object's membership is exact and definite. Mathematically, classical sets use ones and zeroes to mark whether membership is true or false, while fuzzy sets use fractions that range from zero to one. These fractional numbers, known as the *grades of membership*, measure the alignment between conceptual and perceptual definitions. For instance, a basketball put in the category of spheres has a high grade of membership (close to one) because its appearance aligns with our geometric understanding of sphericity. To fit our perception of the object into our conception of the category requires minimal mental gymnastics. However, putting Boullée's Cenotaph for Newton in the category of spheres may require some imagination, since its central void resembles a sphere, not its exterior physical form. The Cenotaph less obviously meets the standard definition of sphericity, thus its grade of membership is closer to zero.

In fuzzy sets, the grade of membership is the inverse of the degree of mental compensation required to stretch our conception of a category to include a given thing. This

4. Ministry of Internal Affairs and Communications. "Fire Service Act." July 24, 1948. http://www.japaneselawtranslation.go.jp/law/detail_main?re=01&vm=02&id=1994.

5. Lotfi A. Zadeh, "Making Computers Think Like People," *IEEE Spectrum* 21 (August 1984): 26.

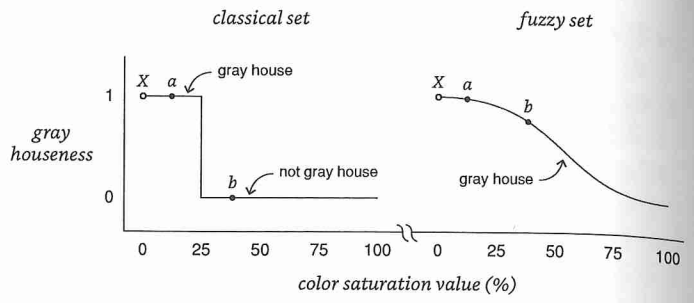

Image 1: A fuzzy set of gray houses (X) comprises the Davis Studio and Residence, the Bjornson House, the Villa Snellman, the Upper Lawn Pavilion, and the Koshino House and can include the Machiya in Daita (a) and the Vanna Venturi House (b) because the boundary between *gray house* and *not gray house* is measured with grades of membership instead of binary values. All images courtesy the author.

conceptual stretch, what Zadeh calls "elasticity," is not a measurement of probability because it is not mathematically deduced. Rather, grades of membership are subjective values that indicate the distance from norms. The Vanna Venturi House does not completely conform to normal color descriptions of gray, but it is possibly gray when considering the building's history and the perceptual limits of color.

The vagueness associated with fuzzy sets can serve as a means for categorizing architecture because it moves from a definite set of references to an indefinite one whose boundaries are imprecise. Consider, for example, a category of gray houses that includes Frank Gehry's Davis Studio and Residence, Arata Isozaki's Bjornson House, Gunnar Asplund's Villa Snellman, Alison and Peter Smithson's Upper Lawn Pavilion, and Tadao Ando's Koshino House. To include the Vanna Venturi House in this set, see image 1, would be more of a stretch than, say, including Kazunari Sakamoto's Machiya in Daita because Sakamoto's silver appears more conventionally gray than Venturi's gray-green facade. But in a fuzzy set, the boundary limiting what constitutes a category is imprecise, so any grouping of gray houses can be pushed beyond perceptual norms. By extension, one could include a greenish building in a group of gray houses.

The potential for instrumentalizing vagueness in architecture lies in the ability to systematically include or exclude things in a category in order to redefine it. Including something perceptually not-gray in a category of gray houses brings a new type of gray house into existence. Similarly, vague thinking is a creative act that reframes the nature of categories by applying granular metrics to words and concepts, furnishing them with new meanings.

A Device for Vagueness

Vagueness is particularly instrumental in today's new regime of architectural image-making because the way architects have been thinking about form and space through drawing

is incompatible with the medium of images. When architectural production shifted toward Photoshop, V-Ray, and other raster imaging programs, vagueness became increasingly relevant as a design tool. Unlike drawings, raster images change in resolution because they are pixelized, varying in precision from lo-res (low pixel number per inch) to hi-res (high pixel number per inch). Resolution presents an interesting set of form-finding problems because the limits of a given object become more indeterminate when there are more pixels to sort. While architectural production has been dominated by technical drawing, vagueness has had no pictorial means. In constructed drawings, which follow the rules of Renaissance perspective and parallel projection, linearity revealed clear distinctions between objects.

In fact, visual representation often embodies more specific information than our physical perception of the world, and our perception holds more specific information than our verbal descriptions.[6] Let us take blueness as an example. One can image blueness more precisely than one can see it, and one can see it more precisely than one can talk about it. Perceptual subjectivity reveals uncertainties in language (Did you mean sky blue or cerulean?), and digitization in computer images similarly reveals the indeterminacy of visual perception (Did you see #99ffff or #66ffff?). Communicating the meaning of vague terms often registers differently in different mediums, which makes universal definitions uncertain, or at least hard to share. This raises any number of difficulties, architectural or otherwise, in using visual representation and language to act on the world.

The proliferation of raster images in architectural production today has made vagueness ever present. Though far more visually descriptive than drawings because of their dense information structures, these images actually widen the distance between representation, language, and perception. Ever-higher resolutions increase the possibility for vagueness, and thus the potential for designers to integrate vagueness into architecture in thorough and influential ways.

A raster image is structurally nonhierarchical because it follows a grid measured by imperceptibly small pixel units.[7] Image processing was invented in the late 1960s to hierarchize discrete information in order to simulate how we see, but a raster image contains no information on hierarchies of visual perception before analysis – that is, there is no preexisting boundary between forms in a raster medium. The many algorithms used to accurately describe forms in Photoshop alone

6. Bertrand Russell, "Vagueness," *Australasian Journal of Psychology and Philosophy* 1 (June 1923): 87.
7. See John May, "Everything Is Already an Image," *Log* 40 (Spring/Summer 2017): 9–26.

Image 2: Harun Farocki, still from *Parallel I*, 2012.

demonstrate not only the lack of specificity in programming languages but also the inherent vagueness of image analysis. Such form-finding problems could thus be said to resemble the sorites paradox, insofar as they are exercises in representing indefinite limits. For example, if maximized to a standard monitor's full resolution of one million pixels, image 2 is a picture of the sky, but one pixel would not be a picture of the sky. Blacking out one pixel or even an edge column of pixels still makes a picture of the sky, but the actual number of pixels that constitutes the border between sky and not-sky is impossible to find. The same logic can be applied to outlining the clouds in image 2. It is inconclusive whether the clouds are a group of pure white pixels, the absence of pure blue pixels, or something in between. At the same time, designing in a raster medium still retains some focus because finding figures and sorting parts is bounded by the fringe between absolute conditions.

Sorting what fine-grained parts constitute a whole makes conceptual definitions of perceptual qualities apparent. What we might intuitively recognize as an object – a cloud or sky – can be inspected with the technical lens of raster imagery and the conceptual framework of vagueness to reconfigure qualitative definitions and augment our initial formal and aesthetic judgment. This requires focusing on fringe conditions, not unlike the way borderline cases of small, tall, or gray are ways to associate familiar qualities with indeterminate forms.

Despite broad discussion about these vague terms in architectural design and pedagogy, we lack the proper means to collectively evaluate them. Raster imagery is better equipped than drawing to study these vague qualities because its granularity makes possible an examination of the blurred edge between form and its effects, or an effect and its corresponding form. Robin Evans highlighted this problem of

8. Robin Evans, "Translations from Drawing to Buildings," in *Translations from Drawing to Buildings and Other Essays* (London: AA Publications, 2011), 5.

9. If Russell's description of vagueness sounds similar to Venturi's both/and phenomenon, it is no mistake. Ambiguity is a close cousin of vagueness because it reveals the uncertainty in certain linguistic and logical structures. But in linguistic definitions, ambiguity is binary uncertainty whereas vagueness is uncertainty involving unresolved or undistinguished entities. Russell, 89.

10. For more examples, see Martin Jay, "Introduction: Genres of Blur," *Common Knowledge* 18 (January 2012): 220–28.

description: "Not all things architectural can be arrived at through drawing. There must also be a penumbra of qualities that might only be seen darkly and with great difficulty through it. If judgement is that these qualities in and around the shadow line are more interesting than those laid forth clearly in drawing, then such drawing should be abandoned, and another way of working instituted."[8] But for raster imagery to become more than technique, for its vagueness to be productive for architectural design, its opportunities must support a way of thinking that is unavailable in extant media.

Thinking with Information Loss

In his 1923 article "Vagueness," Bertrand Russell compares the vagueness of knowledge to visual representation. He writes, "A representation is vague when the relation of the representing system to the represented system is not one-one, but one-many."[9] In his example, a smudged photograph of a man is vague because his appearance is indistinguishable from other men. The loss in detail from erasure allows the representation of one person to be read as many people. Russell warns against accepting vagueness as a fundamental quality of things, which he believes only occurs in their representation. Limitations in visual media and human sight render one's perception of a man vague, but the man himself is not. Studying his identity more closely with a microscope, for example, would perhaps change the way we identify him, because a cellular view is a form of representation that could contradict previously held beliefs.

Russell's clear/unclear dichotomy presents a way of thinking with information loss and blur that is incompatible with drawing. Like squinting at city lights, the visual blur experienced when viewing objects is a new way to see something, which changes how we identify and depict its qualities.[10] This information loss can be considered the freedom to abstract content in order to work with it anew. To explain how this phenomenon is uniquely suited to the raster medium, we can substitute the erasure of visual information for Russell's notion of a loss of detail.

Raster imagery problematizes information loss and blur because it is a resolution-dependent media. This means that images change in quality at different scales because the amount of information stored in a raster image is limited to the number of pixels fitting within an image frame. Enlarging a raster image increases its pixel number, but no information is added. In the absence of additional

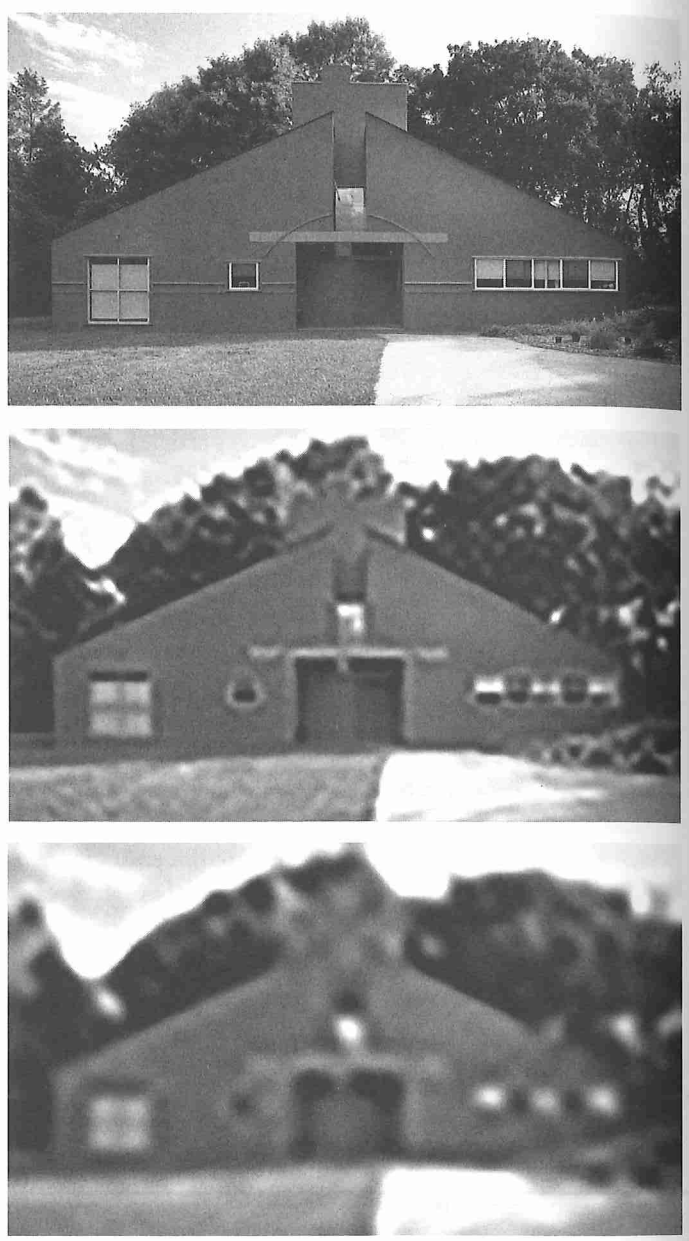

Image 3: Robert Venturi, Vanna Venturi House, Philadelphia, 1964. From top: (a) 100 percent scale, (b) 10 percent scale interpolated to full-scale (c) five percent scale interpolated to full-scale.

information, a secondary, controlled process called interpolation fills in gaps with approximate pixel values. In Photoshop and other raster graphics editors, interpolation introduces visual blur such that a picture's blurriness is a visual index of how much information was lost in the scaling process. Image 3b of the Vanna Venturi House looks blurry because it contains only 10 percent of the visual information from image 3a; the remaining pixels are a product of the interpolation inherent in Photoshop's scaling process. Though the pitch in the

11. See, for example, Hernán Díaz Alonso's winning entry for the 2005 MoMA PS1 Young Architects Program and Reiser + Umemoto's West Side Convergence for the 1999 IFCCA Competition for Manhattan.
12. Greg Lynn, "Intricacy," in *Intricacy* (Philadelphia: University of Pennsylvania, 2003), 2–4.
13. In *Perspective as Symbolic Form*, Erwin Panofsky notes that in antique theories of space "the totality of the world always remained something radically discontinuous." Antique perspective depicted space using localized distortions, lacking the totalizing unity found in Renaissance perspective and subsequent ideas of space. Raster imagery returns to a pre-Renaissance notion of space because the pixelization of images renders it discontinuous. Erwin Panofsky, *Perspective as Symbolic Form*, trans. Christopher Wood (New York: Zone Books, 1991), 44.

elevational profile remains, smaller details like window casings disappear. Further detail is lost and the effect of blurring is more pronounced when the original image is reduced to five percent of its initial content (image 3c) because there are fewer pixels available to inform the new image.

On a pixel-to-pixel basis, interpolated images are similar to the topological surfaces found in digital projects from the early 2000s.[11] Both have applied averaging techniques to smoothly transition between discrete parts, but this is where the similarities stop. Methodological overlaps between the digital project and parametric modeling do not create aesthetic effects and conceptual domains similar to a vague project and raster imagery. Whereas digital projects of the past have incorporated smoothing to generate form, vagueness uses blurriness as a conceptual tool. Investigating how well the Vanna Venturi House fits into the category of houses by erasing the distinguishing features of its facade does not preclude the design of a new house by any digital or non-digital means. Employing resolution to probe concepts that define architectural categories, like houses, does not leverage processing power toward making what Greg Lynn calls "elegance, rigor, expertise and . . . beauty" in tectonic connections, aggregates, or assemblages, because in the digital project, information is added in the smoothing process.[12] The two projects apply smoothing techniques toward different ends, with opposing relationships to information. Whereas file sizes tend to increase when smoothing models in a parametric project, they tend to decrease when blurring images in a vague project.

While abstraction can be conceived as a critical methodology for responding to formal intricacy, in raster imagery it is possible to work with both seemingly opposing concepts at once. That is, articulation in the medium can coexist with inarticulation in the content. In raster images, any blurriness makes identifying content difficult, even though the pictorial structure has the capacity to carry millions of discrete bits of information. The potentials of abstraction found in photographic blurring can be carried over to raster imagery simply because pictures have the capacity to elicit any number of subjects. And pictorial flatness removes the definite formal qualities that 3-D modeling affords, rendering space discontinuous and incomplete.[13]

The imbrication of representation and knowledge is seen in the enduring historical concept that architectural ideas can be given presence with form. Much like mathematical space

was operative for Cartesian dualism and rationalism, drawing was instrumental for concepts like ambiguity and indexicality because distinction as a way of thinking is well represented by precise graphics. In any line drawing, there is a clear difference between drawing (line) and not-drawing (no line), which allows for binary clarity about the shape, proportion, and extent of a drawing's subjects. Historically, such linear representation has continuously supported imaging tasks that require analytical precision.

Vagueness, on the other hand, is a reminder that some forms of knowledge are data resistant. This phenomenon eschews rationalist logic because adding information (or pixels) does not offer more clarity or understanding. While Eubulides's sorites paradox does not tell us at what point a small house is no longer a small house, it does make us conscious of the metrics and limits of its domain. Objective models, like the scientific method, rely on increasing quantities of information in order to verify hypotheses, whereas fuzzy logic and vague thinking reconfigure existing frameworks that conceptually and perceptually structure something's existence. Thus knowledge gained from vagueness is focused less on the object than on what constructs its definition. What defines the category of small windows, tall facades, or fat proportions cannot be fully answered with a descriptive or quantitative approach because the question concerns *how* one judges qualitative values.

Vagueness creates knowledge by adjusting concepts of identity. In *Vagueness and Contradiction*, Roy Sorensen argues that vagueness uncovers the "analytic error" that things belong in discrete categories.[14] He cites the example of two parties that disagree on the quality of an object, in this case, whether pudding is a solid. If they can be convinced that their disagreement is due to the vagueness of said quality, then both parties will withdraw their original beliefs. In other words, if there is agreement that something is a borderline case, one does not continue to believe that it exists in a binary condition. Vague logic "dissolves" analytical disputes and encourages us to reconsider what it means for a quality to be known. This method produces knowledge by adjusting, or even contradicting, a priori classifications, and thus clears a space for developing alternatives. If what I thought was a gray house no longer holds true because I acknowledge that grayness is a vague quality, then according to Sorensen, the contradiction reveals that what I believed was false.

Setting aside a priori categories in architecture, like tall buildings or small houses, is not a dumbing down of architectural knowledge. Rather, contesting accepted norms by identifying and examining borderline cases is a creative process that productively engages the fuzziness surrounding physical qualities. As philosopher William James wrote on vagueness and imagination, "A blurred picture is just as much a single mental fact as a sharp picture is; and the use of either . . . require[s] some other modification of consciousness than the mere perception that the picture is distinct or not."[15] For James, making a blurred picture is akin to constructing a new idea, not an inferior version of an image that is clear.

Introducing the concept of architectural borderline cases sidesteps now-classic distinctions and camps – Whites vs. Grays, modernist vs. postmodernist – to uncover new architecture and ideas. In its lack of distinctness, vague architecture resists classification. Casting this doubt means that we, as both designers and viewers, get to inhabit the space of imagination a little longer. This pause makes room for questions like: is grayness made of red, green, and blue hues or the absence of light? The value of a project on vagueness, and the value of uncertainty in general, is this productive delay. Claiming that the Vanna Venturi House is vaguely gray is not an ignorant or indecisive act. It is a carefully considered position that takes into account the conceptual nature of color with the perception of a building over time. It deliberates over the various metrics used to evaluate architectural qualities that are as defined by technology as they are by socioeconomic factors and visual culture. Advocating for the exploration of vagueness in architecture does not suppose a relaxation of judgment; rather, it finds ways to be clear about realizing something unclear. In designing with vagueness, we take pleasure in tugging at the elastic boundary surrounding normative distinctions between tall and not tall, small and not small, or house and not house, even if it is gray.

14. Roy Sorensen, *Vagueness and Contradiction* (New York: Oxford University Press, 2008), 28.

15. William James, *The Principles of Psychology* (Cambridge: Harvard University Press, 1981), 695.

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