Empirical aesthetics:
the body and emotion in extraordinary architectural experiences

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ABSTRACT:

While there have been many theoretical and philosophical speculations on the role of emotion and embodiment in the aesthetic experience of architecture, there have been little or no actual empirical support substantiating the claims made. If this lack of hard proof was not an issue in the past, our epoch, profoundly influenced by Modernity, has made increasingly difficult to advance any significant allegation without providing some factual evidence in the scientific sense. This paper reports on work directed to address this challenge. Using a previously documented survey on Extraordinary Architectural Experiences, a large quantity of 'qualitative measurements' was collected along 13 categorical variables gauging feeling and embodiment. These data were then thoroughly examined through four levels of statistical analysis. The results empirically demonstrate 69 significant correlations among the variables and thus the central role of embodiment and emotion in extraordinary architectural experiences. Of these correlations, 23 were specifically analyzed to define their psychological and physical characteristics to an unprecedented level of detail. It is hoped that this knowledge sets up a foundation from where to test, develop, and/or apply old and new hypotheses of aesthetic affect and effect in architecture.

CONFERENCE THEME: On Measurement
KEYWORDS: aesthetics, phenomenology, feeling, embodiment, survey

INTRODUCTION

This paper reports on the central role that embodiment and emotion play during the highest aesthetic encounters with architecture using statistical analyses of a massive survey of Extraordinary Architectural Experiences [1] (EAEs) conducted between in 2007-2008.

Aesthetics has been one of the hardest areas to give in to the pleas for scientific validation. Quite simply, these events involve unobservable phenomenology occurring in the seemingly impenetrable subjective box of embodied consciousness. The record of efforts geared toward addressing this situation is poor even we consider the Gestalt psychology of the first half of the 20th Century or the focused studies conducted by behavioral and cognitive psychology of the last 50 years. The limitations of this work come from dealing with ordinary perception defined within a narrow and basic level of operation that not only avoids aesthetics and the extraordinary but also has little application for architecture. The investigations on the semiotics and phenomenology of the built environment during the 1980s and 1990s (Krampen 1979, Norberg-Schulz 1985, 1971, Rapoport 1982, Robinson 2006, Seamon 1993, Tuan 1977) targeted this knowledge gap using 'meaning' as its main focus of inquiry — thus addressing larger and more holistic, symbolic and cognitive responses to architecture. While there is no question that these studies delivered valuable insights, their approach was largely directed toward ordinary engagements of buildings and therefore left untouched the most precious and significant experiences of architecture. The fact that there is very little published information either describing or even just acknowledging the highest aesthetic reception of architecture is a case in point (Bermudez 2009b). When scholars have tried to address them (Perez-Gomez 2006, Jones 2000), the highly qualitative nature of the phenomenon made them return to pre-modern methods of reasoning, hermeneutics or poetic narrative, thus failing to respond to contemporary demands for scientific scrutiny.

The work reported in this paper responds to this situation by judiciously using science to investigate

our most exceptional encounters with architecture. In this sense, it shares commonalities with Experimental Philosophy ("X-Phi"), a new and growing reflective practice focused in applying empirical examination to issues that have resisted scrutiny on the basis of analytical reasoning, phenomenological inaccessibility, and/or distrust of science (Knobe & Nichols 2008). This research is also related and finds inspiration in another emerging area of scientific-philosophical scholarship and debate around the matters of "qualia" (Chalmers 1995, Dennett 2005, Mogi 2010).

1. PREVIOUS SURVEY FINDINGS SUPPORTING THIS STUDY

Bringing the experimental rigor of science to illuminate the aesthetic reception of architecture meant to design and conduct two independent and identical surveys (in English and Spanish). The goal was to collect a substantial number of responses so that the data could be statistically studied. The polls were freely accessible on the internet for one year (April 2007 to April 2008) and gathered the largest number of personal accounts of EAEs ever collected (1,890 in English and 982 in Spanish). I will not here expand on the rationale, details, and decisions shaping the Survey nor the responding population characteristics. This information is available elsewhere (Bermudez 2011, 2010, 2009a, 2008).

In order to facilitate the readability of the results, responses to the English survey will be formatted in **bold** whereas answers to the Spanish poll will be in italics. Given their identical nature, from now on, when I say 'survey' I will be referring to both at once.

The reason for looking in depth at embodiment and emotion in EAEs come from the findings of the first round of analyses of the survey data. Asked to select five main qualities describing their exceptional aesthetic event (using a list of eight words —*alert, analytical/intellectual, emotional, graceful, personal/private, pleasurable, sensual/perceptual/physical, timeless;* and/or entering up to three of their own), participants of the poll agreed in the top four characteristics:

"Emotional" (70.5%, 76.5%),

"Sensual/Perceptual/Physical" (71%, 50%),

"Timeless" (50%, 37%), and

"Pleasurable" (41%, 38.5%)

The very high ranking of "Emotion" in comparison to all the other experiential descriptors in the Spanish responses suggests that, for this population, the arrived internal state (i.e., the effect of architecture in the person) is central to the experience, and probably what drives and brings everything together into a coherent phenomenology. Although the English population also ranks "Emotion" very high, there is a tie with "Sensual/Perceptual/Physical" suggesting a balance between internal and external foci. The very high ranking of the sensible/corporeal/material by both groups not only confirms the fundamental (and obvious) role that the observable play in the aesthetic reception of architecture but when coupled with feelings strongly point at the intimate intertwining of the sensual and the emotive. In short, the top two qualifiers affirm that EAEs are first and foremost perceptive engagements directed in two ways: outwardly (perceptions done by the senses—*sensibility*) and inwardly (perceptions gauged by feelings—*sentiency*), both unavoidably tied to the body.

Casting further light on the role of embodiment and feelings in EAEs demands to briefly consider the third and forth descriptors in the context of a fifth. "Pleasure" recognizes the delight born out of experiencing architectural qualities whereas "Timelessness" insinuates a dramatically slowed-down event of a meditative kind, able of more heightened experiences. Notice that someone could argue for a less 'fleshy' phenomenology, one that delivers instead intellectual "pleasure" and "timelessness" —something that no doubt occurs and many of us have enjoyed. However, the low **fifth** and *sixth* ranking of the descriptor "Analytical/Intellectual" (**36%**, *34.5%*) in the survey implies that cerebral (i.e., detached) activities play a secondary role in EAEs. Actually, the statistical study of only those responses with "analytical/intellectual" as their main qualifier (i.e., **100%**, *100%*), still finds "Sensual/Perceptual/Physical" (**73%**, *56.2%*) and "Emotion" (**67.7%**, *81.8%*) in second and third place, followed by "Timelessness" (**47.5%**, *35%*) and "Pleasure" (**42.2%**, *43.3%*). In other words, survey participants state that mental operations during EAEs are not running the experience but instead playing along, in a background or supporting role. Emotions and body, however, remain central to this phenomenology. [2]

More evidence supporting the important function of embodiment and feelings in EAEs come from responses to specific questions addressing them and included in the poll. The survey data overwhelmingly depict EAEs as intense (80%, *88.5%)*, profound (89%, 91.5%), and vivid (85.5%, 84.5%) phenomenologies that are likely to start suddenly (51.5%, 58.5%) and surprisingly (76%, 83%), and run spontaneously (78.5%, 91%). Not only are they not too stable (46.5%, 47%) or controllable (44%, 55%) but unlikely to finish at one's will (33%, 37%). More 'spectacular' is the literal performance of the body during EAEs. Survey respondents acknowledge the regular presence of strong corporal reactions (56.5%, 43%) and that one in 5/3 EAEs wept — an extreme form of physical response. Given this level of emotional and corporal arousal, it is not surprising that EAEs were said to remain very strongly imprinted in memory (63.5%, 63.5%) and considered as or more powerful than other extraordinary life experiences (91.5%, 77%).

2. METHODOLOGY

The survey devoted 13 questions to gauge embodiment and emotion during EAEs (See Appendix 1). Four consecutive statistical analyses were applied to the collected data. The first was a general examination and produced using the mathematical engine of *StudentVoice* —the online survey provider contracted to encode the questionnaire and then collect and organize the data entered by the participants (www.studentvoice.com). The information provided above comes from this first level of study (Analysis #1).

The second analysis consisted of *Pearson's Chi-Square* tests of each variable. The objective was to verify that there was a significant difference in the probability of answering one way or another to a particular question. The third round of statistical analysis also resorted to *Chi-Square* tests but studied the associations between the 13 variables to determine if there existed correlations between them. *Given* the nature of the test, this has to be done two at a time. Following standard statistical practices a *probability p-value* equal or below 5% (0.05) was recognized as reliable significance.[3] Lastly, since a Chi-Square test does not define the strength and nature of a relationship (only that there is a significant one), the fourth study considered such interaction using a descriptive statistical query. This was done by 'segmenting' the survey data by means of *StudentVoice* statistical software. This analysis allowed the comparison of, for example, how those responding "yes" or "no" to a particular question answered a second question, thus illuminating their correspondence at a higher level of statistical resolution.

3. SIGNIFICANCE OF THE VARIABLES OF EMBODIMENT & EMOTION IN EAES

Of the 13 mentioned questions (Appendix 1), there were 9 designed to directly gauged emotion and embodiment and 4 to provide supporting evidence. Below are the 9 main categorical variables. In parenthesis are the p-value obtained thru the significance test. The underlined number is the p-value calculated on the data combining English and Spanish survey results.

Body reactions (**0.00,** *0.073*, 0.00)

Weeping (**0.00**, *0.00*, 0.00)

Speed of Arousal —Sudden or Gradual (**0.00**, *0.193*, 0.00)

Type of Arousal —Surprising or Expected (**0.00**, *0.00*, 0.00)

Experiential Stability (**0.00**, *0.12*, 0.00)

Intensity (**0.00**, *0.00*, 0.00)

'Profoundity' (**0.00**, *0.00*, 0.00)

Vividness (**0.00**, *0.00*, 0.00)

Spontaneity (**0.00**, *0.00*, 0.00)

The 4 indirect categorical variables are:

Controllability (**0.34**, *0.00*, 0.20)

Willful Ending (**0.00**, *0.14*, 0.00)

Comparison with other 'very strong life experiences' (**0.00**, *0.00*, 0.00)

Fresh/Vivid Recall (**0.00**, *0.00*, 0.00)

The results of the Chi-Square tests support the significance of the responses to all the variables except in the Spanish responses to "Body Reactions", "Speed of Arousal", "Stability", and "Willful Ending". In the case of "Body Reaction", we can make waive a strict statistical interpretation given the overall survey results, the strong response given to this same question by the English participants, and (fundamentally) the borderline condition of the p-value (0.073, or 92.6% confidence). It should be noted that when we compound the English and Spanish results for each of the 'troubled' variables (i.e., we consider them as a whole), the variables pass the significance test. More problematic is "Controllability" in the English survey since not even compounding the dataset delivers enough significance. While this could be a serious problem if we studied it (or any of the other) specifically, the fact that a particular variable does not return significance does not require its elimination from a correlational study (Analysis #3 next). [4] In the end, most of the variables did pass the Chi-Square test which means that they can be trusted to deliver significant responses within their area of application (i.e., the question itself). This outcome also validates the general roster of questions devoted to probe into this matter. We only need to be cautions when we look at the data within any of the four variables with high p-values.

4. SIGNIFICANT CORRELATIONS AMONG THE 13 VARIABLES

We will next consider the correlations among these 13 variables using the Chi-square test. Chart 1 shows a summary in a visually friendly format. Those interested in seeing the actual p-values may refer to Chart 2 in Appendix 2.

Of the 72 possible correlations, there are only 3 cases where no relationships between variables were found, 17 have split results (either English or Spanish data bear no dependency between variables),

	Sudden	Surprising	Weeping	Body Reactions	Stability	Intensity	Profoundity	Vividness	Spontaneity	Controllability	Willful Ending	Comparison	Vivid Recall
Sudden		+	+	+		+	+	+	+	+	+	+	+
Surprising	+		+	+		+	+	+	+	+	+	+	+
Weeping	+	+		+	+	+	+	+	+	+	+	+	+
Body Reactions	+	+	+		+	+	+	+	+	+	+	+	+
Stability			+	+		+	+	+	+	+	+		+
Intensity	+	+	+	+	+		+	+	+	+	+	+	+
Profoundity	+	+	+	+	+	+		+	+	+	+	+	+
Vividness	+	+	+	+	+	+	+		+	+	+	+	+
Spontaneity	+	+	+	+	+	+	+	+		+	+	+	+

Chart 1: Summary of Chi-square test results analyzing the dependency or independency among the 13 variables (study done in pairs). A "+" means that there is correlation between the variables (i.e., p-value < 0.05). A black box communicates no correlation between the variables (i.e., p-value > 0.05). A black triangle represents no correlation in the result of the English (if on the left side) or Spanish (if on the right side) survey.

and 52 show variable correlations that are agreed by both survey groups. Overall these results fair well in terms of the appropriateness of the chosen dimensions to gauge the phenomena. Should there have been widespread independency among the variables, we would have concluded that there were no significance or relevancy in the variables used to measure the event in the first place.

"Spontaneity" and "Profoundity" have the most number of correlations with other variables (11.5 of 12 possible) with only one negative —with the Spanish "Weeping" and English "Controllability" respectively. This means that both play an important role in attaining and/or sustaining EAEs in general and embodiment and emotion in particular. Second in cross-correlational impact are "Intensity", "Weeping" and "Sudden Arousal" with 11, 10.5 and 10 correlations of the 12 possible, respectively. After that, "Body Reactions" and "Vividness" follow with 9.5 and last come "Surprising" and "Stability" with 9 and 8.5.

This ranking is only relatively useful because it is very different when we consider either the Spanish or English data in isolation. In fact, all but 1 of the 17 split correlations come from statistical 'rejections' of the Spanish survey variables. Without going into a discussion of the effect or impact of language and culture in EAEs, body and feeling (a topic to be covered in the future), it is evident that there are important differences. It is important to note, however, that "Body Reactions" is one the variables displaying most differences between Spanish and English responses. Let us note that Spanish survey respondents reported body reactions in less than one-half of their EAEs (much less than English speakers). It is this particular response that sets up much of the discrepancies between the two groups in terms of the topic that preoccupies us here. However, if we now turn our attention to "Weeping" we will observe a reverse pattern. Here Spanish speakers acknowledge a much higher level of expression than the English group. We can speculate that, perhaps, it is this higher facility to let themselves cry that lessen the body reactions of Spanish survey participants. Possibly by repressing tears, Anglo-speakers channel their heightened emotional state into the body —effects that are socially invisible and therefore more acceptable within their cultural mileau (Elkins 2001). For this reason, a much better measurement of the literal reactions of the body could be to combine "Body Reactions" and "Weeping". When we remove all overlapping between EAEs said to have both of them at the same time and add up EAEs reported to produce either one, the percentage of explicit and dramatic corporal manifestation goes up to **60.7%** and *58.9%*.

We should not allow these correlation discrepancies between Spanish and English surveys to obscure the fact that, on the whole, there is much overlap between the two groups: 55 agreements against only 17 disagreements. This is a 66% coincidence. This considerable commonality provides a good foundation from where to aboard the next level of analysis.

5. STATISTICAL DESCRIPTIVE STUDY OF 23 CORRELATIONS

Having established the universe of statistically correlated variables, we can look more closely at the relationships themselves. This means that we must bring comparative statistical studies to consider the likely nature and strength of the relationship (Analysis #4). Notice that the relationship needs to be considered from both sides. Since a detailed discussion of the 52 common (English-Spanish) correlations would not fit the length of this paper, I will present 23 that exhibit powerful interactions in terms of directionality and strength. We will follow the format sketched above: first the statistical result, then a short interpretive analysis followed by a conclusion. An "*" means that the particular statistics that precedes it were not found significant by Analysis #2 and therefore can only secondarily assist our reading. The statistical results will be summarized in the following format:

VARIABLE 1 < > VARIABLE 2

Variable #1 *and* Variable #2 (Difference between (a) and (b); (a) Response to Variable #2 by those that answered YES to Variable #1 versus (b) Response to Variable #2 by that those that answered NO to Variable #1)

Variable 2 *and* Variable 1 (Difference between (a) and (b); Response to Variable #1 by those that answered YES to Variable #2 versus Response to Variable #1 by that those that answered NO to Variable #2)

Let us now move into the presentation of the findings. When appropriate (i.e., similarities), I have included two or three correlations together.

BODY REACTIONS < > WEEPING

Body Reactions and Weeping **(+16.9%; 24.5% vs. 7.6%)** *(+20.2%; 36.6% vs 16.4%)*

Weeping and Body Reactions **(+28.7%; 79.3% vs. 50%)** *(+36.5%; 68.3% vs 31.8%)*

Analysis: EAEs with body reactions involve **three**/*two* times more weeping than those without any corporal sensations. On the other hand, EAEs that cause crying generate more body reactions than those that don't (**one-and-a-half**/*two* times as much).

Conclusion: there is a strong positive correlation between body reactions and weeping, with the former taking the lead. The more body reactions the more likelihood of weeping.

BODY REACTION < > PROFOUNDITY / BODY REACTION < > SPONTANEITY

Body Reactions and Profoundity **(+6.5%; 91.6% vs 84.1%)** *(+10.8%; 96.4 % vs 85.6%)*

Profoundity and Body Reactions **(+14.3%; 58 % vs 43.7%)** *(+30.1%; 45.5% vs 15.4%)*

Body Reactions and Spontaneity **(+12.1%; 83.6% vs 71.5%)** *(+10%; 94.2 vs 84.2%)*

Spontaneity and Body Reactions **(+18.8%; 60.7% vs 41.9%)** *(+25.9%; 45.9% vs 20%)*

Analysis: while the presence of body reactions indicate increasing profoundity/spontaneity, profoundity/spontaneity has a much bigger effect in eliciting body responses. In other words, a profound or spontaneous experience will tend to cause body reactions more readily than corporal sensations catapult oneself into a profound or spontaneous phenomenological state.

Conclusion: there is a positive correlation between body reactions and experiential depth/spontaneity but it is the latter which most likely holds the initiative.

WEEPING < > INTENSITY / WEEPING < > PROFOUNDITY

Weeping and Intensity **(+15.3%; 92.2% vs 76.9%)** *(+14.2%; 96.1% vs 81.9%)*

Intensity and Weeping **(+13.4%; 20.3% vs 6.9%)** *(+29.7%; 39.2% vs 9.5%)*

Weeping and Profound **(+8.3%; 95.7% vs 87.4%)** *(+9.5%; 97.1% vs 87.6%)*

Profound and Weeping **(+13.3%; 19% vs. 5.7%)** *(+25.3%; 29.1% vs 3.8%)*

Analysis: while weeping foretells intensity and profoundity, it is intensity/profoundity the one most likely to cause weeping (by increasing 3, 4 and even 8 times its occurrence from not-intense or not-profound experiences).

Conclusion: there is a positive correlation between weeping and experiential intensity/profoundity but the relationship depends on intensity/profoundity to provoke weeping.

BODY REACTIONS < > STABILITY / BODY REACTION < > CONTROL

Body Reactions and Stability **(– 11.4%; 41.5% vs 52.9%)** *(–16.7%; 34.6% vs 51.3%)*

Stability and Body Reactions **(–12.5%; 50.4% vs 62.9%)** *(–18.7%: 29.3% vs 48%)**

Body Reactions and Control **(–19.4%; 36% vs 55.4%)** *(–21.1%; 52.7% vs 31.3%)*

Control and Body Reactions **(–20.6%; 45.9% vs 66.5%)*** *(–21.2%; 31.5% vs 52.7%)*

Analysis: EAEs with body reactions are felt less stable than those without and vice-versa: those reporting higher experiential stability witness less body reactions than those acknowledging instability. Similarly, EAEs with body reactions are felt less under control than those without dramatic corporal

sensations. In fact, the more one wants to assert control on the experience, the less the probability of witnessing any corporal effects. The similarity of results between the two populations regarding "Stability" and "Controllability" ease a bit the doubts of considering the not significant variables marked with a "*" (analysis #2).

Conclusion: there is a strong but fairly balanced negative correlation between Body Reactions and Stability/Control.

Commentary: Notice that controllability here necessarily implies conscious volition, that is, an 'intellectual' decision to manage the situation. Since body reactions cannot be truly willed into being, it is natural to find this lack of correlation. It is probable that body reactions are part of what makes the experience 'instable' and felt 'out-of-control', that is, beyond the range of normal behavior, perception or psychological response.

INTENSITY < > STABILITY

Intensity and Stability **(–15.3%; 43.5 % vs 58.8%)** *(–17.6%; 42.9% vs 60.5%)*

Stability and Intensity **(–8.1%; 74.8% vs 82.9%)** *(–16.1%; 81.8% vs 97.9%)**

Analysis: consistently with Stability < > Body Reaction, intensity seems to preclude stability. The more intense an experience, the more instable it is felt. This also suggests the existence of a positive correlation between intensity and body reactions, something statistically proven in the English survey responses but not in the Spanish poll (See Chart 1 and 2). Results of the correlation statistics of the Spanish data that begins with "Stability" needs to be seen with suspicion due to "*".

Conclusion: there is a negative correlation between stability and intensity in EAEs that shows either balance (Spanish data) or intensity leading (the English group).

INTENSITY < > SUDDEN AROUSAL / INTENSITY < > SURPRISE

Intensity and Sudden Arrousal (+19.5%; 53% vs 43.5%) (+19%; 55. 4% vs 36.4%)

Sudden Arousal and Intensity (+11.8%; 85% vs 73.2%) (+8%; 92.4% vs 84.5%)*

Intensity and Surprising (+8.5%; 76.4% vs. 67.9%) (+16%; 76.5% vs 60.5%)

Surprising and Intensity (+2.5%; 81% vs 78.5%) (+13.8%; 91.2% vs. 77.4%)

Analysis: Intensity is a better predictor of sudden arousal and surprise than a rapid onset of the experience or its being surprising. The fact that EAEs unfold at high intensity has a marked influence in this correlation. Notice that surprise plays a more subdue role in English speakers than in Spanish speakers. Spanish statistical results of the impact of suddenness on intensity are very soft as they occur within a variable not showing significance (analysis #2)

Conclusion: there is a positive correlation between Intensity and Sudden Arousal/Surprise with the former likely to provoke the latter.

SUDDEN AROUSAL < > SURPRISING EXPERIENCE

Sudden Arousal and Surprise (+8.5; 78.7% vs 70.2%) (+10%; 89.9% vs 79.9%)*

Surprise and Sudden Arousal (+10.4%; 61.5% vs. 51.1%) (+19.4%; 55.3% vs. 35.9%)

Analysis: Sudden EAEs are reported to be more surprising than gradual EAEs (+8.5%, +10%) and vice versa: surprising EAEs tend to arise more suddenly than those expected (+10.4%, +19.4%). The fact that answers to "Sudden Arousal" were not found statistical significant in the Spanish survey (Analysis #2) diminishes our ability to count otherwise strong numbers towards measuring the strength of the interaction between these two variables. As a result, we must opt for a balanced strength.

Conclusion: there is a positively balanced correlation between Sudden Arousal and Surprise.

BODY REACTIONS < > SUDDEN AROUSAL

Body Reactions and Sudden Arousal **(+15%; 65.2% vs 50.1%)** *(+14.6%; 60.3% vs 45.7%)*

Sudden Arousal and Body Reactions **(+14.9%; 62.4% vs. 47.5%)** *(+13.5%; 49.8% vs.36.3%)**

Analysis: sudden arousal provokes more body reactions than a gradual beginning. At the same time, experiences causing body reactions arrive more suddenly than those that do not. Despite this balance in numbers (one of them not too trustable due to "*"), it stands to reason and experience that suddenness may have a slight phenomenological lead over body reactions.

Conclusion: there is a strong positive correlation between Body Reaction and Sudden Arousal with the latter more likely to take the lead.

INTENSITY< > PROFOUNDITY / INTENSITY < >VIVIDNESS / PROFOUNDITY< >VIVIDNESS

Intensity and Profound **(+12.4%; 91.7% vs. 79.3%)** *(+19.4%; 93.8% vs. 74.4%)*

Profound and Intensity **(+23.6%; 82.2% vs 58.6%)** *(+26.5%; 90.1% vs 53.6%)*

Intensity and Vividness **(+11.8%; 88.2% vs. 76.4%)** *(+11%; 85.4 % vs 74.4%)*

Vividness and Intensity **(+16.5%; 82.64vs 66.1%)** *(+20%; 88.5% vs 68.4%)*

Profound and Vividness **(+9.5%; 87.5% vs 77%)** *(+35.1%; 86.9% vs 51.8%)*

Vividness and Profound **(+10.6%; 91.3% vs 80.7%)** *(+23.3%; 94.3% vs 71%)*

Analysis: Since EAEs are overwhelmingly described as intense, profound, and vivid, we would expect that the presence of one of these qualifiers will call forth the others. The statistics support this expectation. EAEs considered intense are more profound and vivid than those not reported as intense. EAEs experienced as vivid are felt more profound and intense than those not vivid. And profound EAEs are more intense and vivid than those not experienced as profound. However, this three-way relationship is not totally equal. Our descriptive statistics suggest that profoundity has a bigger impact on the others than those on it.

Conclusion: there are positive correlations among Profoundity, Intensity and Vividness with the former having more impact on the latter two than vice-versa.

Commentary: while these three experiential dimensions have visceral, emotional, and mental implications, their first and most clear effect is felt rather than thought, sensed rather than reasoned, and immediate instead of mediate. In other words, they are clear signs of embodiment and emotion.

SPONTANEITY

Commentary: Spontaneity is the art of being natural or unburden of preconceived notions of how things ought to be so that a given situation is let happen as it will. It is an oxymoron to control spontaneity although it is possible to manage oneself to facilitate its progress. However such act is one of surrendering control, in other words steering oneself away from steering. Spontaneity is hard to describe or explain but we all know it when we see or feel it. Spontaneity can be most readily and naturally expressed through our body and emotions. While it is possible to be intellectually spontaneous, it takes quite a bit of skill and is therefore not common. Since spontaneity is correlated with 11.5 of the 12 variables, embodiment and feelings permeate and define EAEs thoroughly.

SPONTANEITY < > SUDDEN AROUSAL

Spontaneity and Sudden **(+21.5%; 63% vs 41.5%)** *(+33.4%; 55.6% vs 22.22%)*

Sudden and Spontaneity **(+14.2%; 84.5% vs 70.3%)** *(+8.7%; 95.5% vs 86.2%)**

Analysis: spontaneous EAEs are one-and-a-half/two times more likely to start suddenly than those that are not. The reverse holds true in direction (more sudden phenomenologies were more

spontaneous) but not in power. While the little trustable "*" Spanish statistics manage to match the statistical direction/strength of its English counterpart, it doesn't provide us with enough confidence to make a final determination.

Conclusion: there is a positive correlation between Spontaneity and Sudden Arousal with the former likely to affect the latter more substantially than vice-versa.

SPONTANEITY < > SURPRISE

Spontaneity and Surprise **(+27.6%; 81.6% vs 53%)** *(+17.9%; 88% vs 61.1%)*

Surprise and Spontaneity **(+27.9%; 84.8% vs 56.9%)** *(+21.1%; 93.7% vs. 72.6%)*

Analysis: spontaneous EAEs are significantly more surprising than not spontaneous phenomenologies. The reverse is true. Surprising experiences encourage more spontaneity than those that are not. The two variables are very much tied in weigh.

Conclusion: there is a balanced positive correlation between Spontaneity and Surprise.

SPONTANEITY < > INTENSITY / SPONTANEITY < > PROFOUNDITY / SPONTANEITY < >VIVIDNESS

Spontaneity and Intensity **(+17%; 83.8% vs 66.8%)** *(+9.2%; 89.2% vs 80%)*

Intensity and Spontaneity **(+19%; 82 %vs 63%)** *(10.9%; 91% vs 79.1%)*

Spontaneity and Profound **(+5.1%; 90.4% vs 85.3%)** *(+12.5%; 92.5% vs. 80%)*

Profound and Spontaneity **(+11.9%; 79.7% vs. 67.8%)** *(+18.7%; 91.1% vs 72.4%)*

Spontaneity and Vividness **(+6.1%; 86.7% vs 80.6%)** *(+24.6%; 86.4% vs 61.8%)*

Vividness and Spontaneity **(+12.1%; 79.4% vs. 67.3%)** *(+8.5%; 84.8% vs 76.3%)*

Analysis: Although there exists a clear dependency between Spontaneity and Intensity, Profoundity or Vividness, Analysis #4 suggests that spontaneity may be more easily facilitated by any of the three (with the exception of Vividness for the Spanish group) instead of the other way around.

Conclusion: there is a positive correlation between Spontaneity and Intensity/Profoundity/Vividness with the latter having a slightly stronger effect on the former.

SPONTANEITY < > CONTROL / SPONTANEITY < > END AT WILL

Spontaneity and Control **(–41.1%; 34.5% vs 76.6%)** *(–45.1%%; 43.8% vs 88.9%)*

Control and Spontaneity **(–28.2%; 62.7% vs 90.9%)*** *(–19.9%; 78.1% vs 98%)*

Spontaneity and End at will **(–26.5%; 27.6% vs 54.1%)** *(–22.9%; 31.4% vs 54.3%)*

End of Will and Spontaneity **(–18.6%; 66.5% vs 85.1%)** *(–13.1%; 80.2% vs 93.3%)**

Analysis: Terminating an EAE at will and having it under control are at the opposite end of experiential spontaneity. Thus, not surprisingly, we find the data and statistics backing up common sense once again (giving more reassurance that this quantitative analysis of qualitative matters is not so far from the mark). Spontaneous experiences are less than one-half as controllable as those not-spontaneous. Controlled phenomenologies are one third/quarter as spontaneous as of those not under control. Similarly, willful ending happens one half/third times less often than when the EAE is running spontaneously. Let us notice that descriptive statistics marked as "*" may be only secondarily considered as they failed the internal significance test (Analysis #2). However, their numbers coincide with those of the other group (not statistically compromised) and common sense.

Conclusion: there is a strong negative correlation between spontaneity and experiential Controllability/ Willful Ending in which the former has much more impact on the latter than vice-versa.

CONTROL < > STABILITY

Control and Stability **(+20%; 55.5% vs 35.5%)*** *(+23.4%; 57.7% vs 34.3%)*

Stability and Control **(+19.3%; 53.5% vs 34.2%)** *(+23.4%; 63.5% vs 40.1%)**

Analysis: the descriptive statistics behind this correlation prove common sense right: exercising control over an experience (i.e., monitoring and steering it toward some consciously desired outcome) creates phenomenological stability. Given the relation of these two variables with other more emotionally and physically bound variables, they provide us with a good reminder of the week influence that mental/conscious management play in EAEs. Results marked with an "*" need careful interpretation since their internal statistics were found not significant (Analysis #2).

Conclusion: there is a strong and balance positive correlation between experiential Stability and Control.

Commentary: corporal reactions and weeping are supreme literal examples of how the extraordinary exalts us to a point that totally bypasses volitive control: it is very hard (often impossible) to consciously command oneself to have goose bumps, shivers, or weep.

CONCLUSION

By bringing together a massive quantity of 'qualitative measurements' along categorical variables and then carrying out a four-level statistical analysis, this work is able to empirically demonstrate the significance of emotion and embodiment in exceptional architectural aesthetics. Additionally, the specific study of 23 correlations begins to map the psychological and physical effects of these experiences to an unprecedented level of phenomenological detail. Since no such empirical map existed before, this representation constitutes a big step forward. Yet, much is ahead. Next steps include the study of the remaining 29 correlations found to be significant by both groups as well as the 17 that only one of them did. Additionally, cross-relational analyses of the one-to-one dependencies and their characteristics need to be undertaken in order to build a larger and more accurate empirical depiction of EAEs. In this sense, even though Analysis #4 points at the direction and strength of a correlation, it is not statistically perfect. For this reason, a full completion of this study would demand correlational analyses among all the categorical variables at once using more powerful and sophisticated statistical methods and tools than those I used here (as available in SPSS —a complex and robust software with high statistical capabilities).

All things considered, however, we must keep in mind that this empirical mapping works on probability and not certainty. In other words, there will be phenomenologies that defy the statistical model. Such occurrence will not negate its validity. For example, some EAEs do unfold non-spontaneously and with little intensity but this doesn't deny the fact that the opposite is much more common or natural as clearly demonstrated by the results from this research. Here lies the rationale for this type of work: to deploy methods, collect data, and produce findings that convincingly demonstrate that certain properties, attitudes, approaches, and qualities, characterize a phenomenon more likely than others. And while such scientific effort could be accused of dissecting the frog (thus killing it and with it all possibility of appreciating its very life), there is also no denying that dissections do deliver quite important knowledge that often benefit both the frog and our understanding of it. I am not here saying that this 'dissection' will either fully explain or make us experience the embodied and emotional nature of an EAE but it will surely help us advance our comprehension. There is room and necessity for a respectful dialogue between phenomenology and science. This is what a science of 'qualia' and X-Phi are all about, as said earlier.

Lastly, it is hoped that this approach and the generated knowledge will strengthen our ability to validate theoretical/philosophical claims made elsewhere. For example, it is already clear that this study affirms many of the arguments advanced by Mearleau-Ponty (1962) in terms of the central role that sensation and the body play in our phenomenology of perception, specially applied to architecture. Another important application could be the development of methods to facilitate the onset of these remarkable experiences. It is likely that aesthetic appreciation, especially of the exceptional kind, has a higher probability of success if we approach architecture with states of embodiment and emotionality similar to those found in this study. Our architectural training too often blinds us from recognizing that subjective conditions are (perhaps) as important as objective circumstances (e.g., the place 'itself') when dealing with aesthetics. We need two to tango.

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APPENDIX 1

Survey Questions gauging embodiment and emotion during EAEs. The 9 in bold letters were designed to directly gauge them whereas the other four bring supporting information.

Question 4:The arousal of the extraordinary experience was… Gradual, Sudden, Don't recall

Question 5: The arousal of the extraordinary experience was… Surprising, Expected, Don't recall

Question 9: As it was happening, did your extraordinary experience of architecture make you weep? Yes, No, Don't Recall

Question 10: As it was happening, did your extraordinary experience of architecture make your body react (e.g., trembling, goose bumps, shivers)? Yes, No, Don't Recall

Question 13 While it lasted, did your extraordinary experience of architecture feel stable? Yes, No, Don't Recall

Question 14: While it lasted, did your extraordinary experience of architecture feel intense? Yes, No, Don't Recall

Question 15:While it lasted, did your extraordinary experience of architecture feel profound? Yes, No, Don't Recall

Question 16:While it lasted, did your extraordinary experience of architecture feel vivid? Yes, No, Don't Recall

Question 17: Was your extraordinary experience of architecture spontaneous?

Question 18: Was your extraordinary experience of architecture controllable?

Question 19: Was your extraordinary experience of architecture ended at your will?

Question 22: How vivid and memorable was your extraordinary experience of architecture in comparison with other very strong life experiences? Well above, Just above, Similar, Just below, Well below

Question 28:How fresh/vivid is your recollection of this extraordinary experience today? Strong (feels like yesterday), Moderate, Vague

APPENDIX 2

CHART 1: P-values obtained through significance tests of the correlations among 13 variables gauging embodiment and emotion in EAEs. The existence of a correlation is established by a p-value <0.05 while no correlation by a p-value >0.05. Underlined numbers indicate 'borderline' p-values (0.07>p<0.05) that are likely (and therefore accepted) to point at a dependency between the variables. N varies from 1,286 to 1,116 (survey in English) and 584 to 376 (survey in Spanish) depending on the question/variable. Black cells show at least one of the p-values to be above 0.05 (and beyond borderline condition), that is, prove no significant correspondence between the variables. As in the rest of the paper, bold numbers stand for English survey statistics whereas italics for Spanish poll data.

	Sudden	Surprising	Weeping	Body Reactions	Stability	Intensity	Profoundity	Vividness	Spontaneity	Controllability	Willful Ending	Comparison	Vivid Recall
Sudden		**0.000** *0.000*	**0.069** *0.024*	**0.000** *0.053*	**0.080** *0.215*	**0.000** *0.025*	**0.010** *0.057*	**0.001** *0.180*	**0.000** *0.000*	**0.000** *0.031*	**0.008** *0.085*	**0.006** *0.059*	**0.000** *0.000*
Surprising	**0.000** *0.000*		**0.025** *0.264*	**0.002** *0.754*	**0.455** *0.109*	**0.012** *0.000*	**0.000** *0.004*	**0.002** *0.007*	**0.000** *0.000*	**0.000** *0.081*	**0.002** *0.381*	**0.000** *0.001*	**0.000** *0.000*
Weeping	**0.069** *0.024*	**0.025** *0.264*		**0.000** *0.000*	**0.000** *0.008*	**0.000** *0.003*	**0.001** *0.028*	**0.000** *0.001*	**0.000** *0.094*	**0.000** *0.000*	**0.000** *0.614*	**0.001** *0.008*	**0.002** *0.070*
Body Reactions	**0.000** *0.053*	**0.002** *0.754*	**0.000** *0.000*		**0.000** *0.002*	**0.000** *0.111*	**0.002** *0.005*	**0.021** *0.536*	**0.000** *0.025*	**0.000** *0.002*	**0.000** **0.112**	**0.000** *0.000*	**0.000** *0.176*
Stability	**0.080** *0.215*	**0.455** *0.109*	**0.000** *0.008*	**0.000** *0.002*		**0.000** *0.000*	**0.000** *0.000*	**0.000** *0.007*	**0.002** *0.036*	**0.000** *0.000*	**0.000** *0.000*	**0.175** *0.339*	**0.051** *0.005*
Intensity	**0.000** *0.025*	**0.012** *0.000*	**0.000** *0.003*	**0.000** *0.111*	**0.000** *0.000*		**0.000** *0.000*	**0.000** *0.000*	**0.000** *0.056*	**0.000** *0.409*	**0.000** *0.002*	**0.000** *0.028*	**0.000**
Profoundity	**0.010** *0.057*	**0.000** *0.004*	**0.001** *0.028*	**0.002** *0.005*	**0.000** *0.000*	**0.000** *0.000*		**0.000** *0.000*	**0.004** *0.014*	**0.193** *0.010*	**0.001** *0.008*	**0.000** *0.016*	**0.000** *0.004*
Vividness	**0.001** *0.180*	**0.002** *0.007*	**0.000** *0.001*	**0.021** *0.536*	**0.000** *0.007*	**0.000** *0.000*	**0.000** *0.000*		**0.000** *0.002*	**0.001** *0.120*	**0.000** *0.380*	**0.000** *0.633*	**0.000** *0.000*
Spontaneity	**0.000** *0.000*	**0.000** *0.000*	**0.000** *0.094*	**0.000** *0.025*	**0.002** *0.036*	**0.000** *0.056*	**0.004** *0.014*	**0.004** *0.002*		**0.000** *0.000*	**0.000** *0.000*	**0.000** *0.000*	**0.000** *0.029*