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Article

# Façade Psychology Is Hardwired: AI Selects Windows Supporting Health

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**Abstract:** This study uses generative AI to investigate the influence of building façade geometry on human physiological and psychological health. Employing Christopher Alexander's fifteen fundamental properties of living geometry and ten emotional descriptors in separate tests, ChatGPT evaluates simple, contrasting window designs. AI analyses strongly and consistently prefer traditional window geometries, characterized by symmetrical arrangements and coherent visual structure, over fragmented or minimalist-modernist alternatives. These results suggest human cognitive-emotional responses to architectural forms are hardwired through evolution, privileging specific geometric patterns. The findings challenge contemporary architectural preferences and standard window archetypes by emphasizing the significance of empathetic and health-promoting façade designs. This novel use of AI suggests integrating neurodesign principles into architectural education and practice to prioritize urban vitality through psychological well-being.

**Keywords:** AI, architecture, Christopher Alexander, empathetic design, façades, healing environment, large-language models, living geometry, neurodesign

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## 1. Introduction

### 1.1. Building Façades Influence Human Psychological Health

The external appearance of buildings communicates distinct and specific architectural styles that define the built environment. Urban regions covering immense areas around the world shape people's psychological states, by influencing the neurological reactions of everyone who experiences them. And yet, standard design thinking posits — erroneously, as this paper suggests — that defining the visual urban environment is entirely the privilege of the individual architect. In fact, the effect of urban information on the human body is immense and it affects human health in both the short and long terms [1–9].

It follows that a major responsibility for a design, especially from those individuals who approve it before building, is to make sure that no harm is done to a city's users. While there are strict guidelines in place for the more obvious physical dangers to public health, unconscious psychological effects of the façade's design are so far neglected. For this reason, architectural culture and the public encourage artistic innovation without any constraints. Indeed, departures from design precedent are celebrated by architects without ever thinking about the possibly negative consequences of their choices.

The most basic components of geometry act directly, though unconsciously, to affect the bodily and mental state of a user. Cognitive and neuromuscular functions are therefore shaped by the visual environment in which a person finds him/herself immersed. Alarming, an extensive 20<sup>th</sup> Century design tradition seems to privilege geometrical elements that could generate anxiety. This fact tends to be ignored while the public focuses on other aspects of design. Investigating health effects of the visual exposure to building façades should become a priority.

### 1.2. Christopher Alexander's Fifteen Fundamental Properties of Living Geometry

Living geometry is defined by a set of descriptors including coherence, fractal scaling, harmony, nested symmetries, and visual balance [10–13]. People instinctively “know” living geometry (though they may not be aware of the actual term), so any study of design preferences must take this into account. The human body responds positively to living geometry, indicating that people’s preferences are set to it, and the body’s reactions are unconsciously activated by its presence. Subjective “likes and dislikes” accumulate on top of hard-wired responses based on living geometry, which can be submerged but never erased.

Generative AI already knows the 15 fundamental properties, listed as follows:

1. Levels of scale
2. Strong centers
3. Thick boundaries
4. Alternating repetition
5. Positive space
6. Good shape
7. Local symmetries
8. Deep interlock and ambiguity
9. Contrast
10. Gradients
11. Roughness
12. Echoes
13. The void
14. Simplicity and inner calm
15. Not-separateness

These geometric properties can be used together with a large-language model by uploading a more extensive description, included here as a supplementary file at the end of this paper. A useful approach is to investigate the existence of “living geometry” as a set of design and tectonic principles by discovering how far it is represented in each built example. Similar methods are used by Bin Jiang [14], Danny Raede [15], and the present author [15]. Testing for the 15 properties provides an objective measure of how far a structure satisfies a specific set of geometric criteria. This paper will establish that the human body preferentially seeks out these 15 properties to maintain its health and well-being.

### 1.3. AI preferences based on ten emotional indicators

Having brought the issue of how environmental geometry affects the human body to general attention, many new techniques of gathering data are available to settle this question today. Those include portable physiological sensors, portable eye-tracking devices, and emotional responses from both real and virtual environments [16–26]. Sensors consistently measure the psycho-physiological effect of different building façades on the people experiencing them. It is easy to correlate sets of geometrical and other qualities that enhance human health, and also identify specific qualities that have the opposite effect. Designers can extract guidelines from exhaustive surveys for improving public health through the sensitive design of the external built environment.

Sidestepping other studies that are actively engaged in measuring user responses to building façades, this paper applies generative AI large-language models to study the effect. AI takes the place of an enormous pool of subjects who could be asked for their façade preferences. The advantages of using AI are many: there is no need to employ a group of individuals; results are immediate; the volume of information accessed by large-language models far exceeds most practical surveys of people. There are, of course, technical questions to consider so that AI surveys are accurate enough to take seriously, and those problems are discussed here.

The world's stored knowledge to which AI has access is mined for people's preferences in building façades. Such an exercise has to resolve the problem of subjective taste and personal opinion. Innate preferences depend upon emotional feedback from what is being experienced. One cannot simply ask a subject what he/she "likes" but has to dig deeper into unconscious bodily responses. Those have been hard-wired by human evolution to help guarantee survival.

One way to circumvent difficulties of subjectivity is by asking a large-language program to evaluate ten distinct emotional qualities perceived in a building's façade. This approach is totally different from evaluating geometrical qualities such as Alexander's 15 fundamental properties. While each emotional quality could be influenced by prior learning, with some more so than others, it is conjectured that their totality provides a largely objective measure. Intuitively, the subjective component of each quality may be canceled by the collective objectivity of all the others in the group. While this ambiguity is especially true of "beauty", several authors are investigating the biological basis for beauty [27–31] with promising results.

Below are ten proposed qualities that elicit a positive-valence feeling from experiencing a built structure, and which are used in the present investigation:

1. beauty;
2. calmness;
3. coherence;
4. comfort;
5. empathy;
6. intimacy;
7. reassurance;
8. relaxation;
9. visual pleasure;
10. well-being.

These ten inherent and observable qualities are based on objective psychological responses from a person's body. The properties are specific enough to use generative AI in testing images for them. Other possible visual factors may draw attention and fascination, but not in an unambiguously positive manner, so they are not included in the above list. The present experiment deliberately departs from a direct mathematical analysis of living geometry, to instead rely strictly on emotional and psychological responses. Combining the above ten qualities is expected to offer an evaluation that is sufficient for the purposes of AI prompting.

Two distinct AI experiments are described here: (i) Evaluating window designs in a building's façade to gauge the presence of living geometry. The first test is achieved using Christopher Alexander's Fifteen Fundamental Properties as a convenient and practical measure for living geometry. Those 15 geometrical descriptors combine to define living geometry represented in any design, façade, or setting. (ii) Supporting those findings by performing an independent evaluation, using an AI large-language model, for the above 10 emotional descriptors. The results from these two independent AI experiments turn out to agree completely. The goal is to prove that emotional responses correlate directly with mathematical content.

Generative AI matches textual cues to predefined criteria. AI-generated evaluations may introduce interpretative biases, as outcomes depend on textual descriptions rather than direct visual input. Consequently, the lack of direct sensory processing cannot capture subtle visual nuances and contextual details that influence human perceptions. Yet this is accurate enough for the present analysis.

#### 1.4. Comparing Pairs of Visuals

This paper applies the method of pairwise comparison to evaluate window shape and positioning. Which one of a pair of similar examples generates a greater positive feeling as a result of

embodying the above ten qualities? Such a relative question is easier to answer than a direct evaluation of each individual quality, which necessitates an absolute estimate of how intensely that particular quality is perceived. In that case, one has to judge whether a quality is present or not; or make a comparative judgment on a Likert scale of 1 to 5, or 1 to 10. That involves more work.

Christopher Alexander faced the same problem of measuring qualities responsible for living structure (which includes living geometry plus other relevant factors such as color, etc.). His solution was to resort to pairwise comparisons in what he terms the “Mirror of the Self Test” [12] (Chapter 8). This practical method proved successful and has inspired pairwise evaluations of buildings using eye-tracking simulation software [32–35]. It is now standard procedure to visually scan a pair of images and determine where the eye is attracted during the first 3 seconds of scanning in pre-attentive gaze, which is an unconscious reaction.

Comparing similar pairs of window compositions through a large-language model derives a consistent set of design criteria. These AI experiments select designs that obey living geometry, without having been programmed to do so. The results identify more traditional design styles as better suited to human health and well-being, arising from AI independently of professional opinion. This means that future window design should incorporate older templates to be perceived as emotionally and psychologically comfortable. Otherwise, a person looking at a façade will see it as an alien structure.

### *1.5. Controversial and Diverging Hypotheses*

This paper’s results turn out to be controversial. First, the standard design toolkit for windows on a building’s façade is questioned as being non-optimal for human psychological health. Second, the professional motives that lead architects to apply standard typologies are also put into doubt. Without wishing to do so, generative AI resurrects the controversy of opposing tastes between architecture professionals and the public. Up until now, contemporary society and the decision-making groups that determine what gets built on a large scale favor the tastes of trained architects. This trend continues despite strong and vociferous opposition from the public.

It has been common practice to frame this debate as occurring between “experts” and “novices”; but it is now time to abandon those labels [36–39]. The reason is that an expert opinion is normally given more weight than the opinion of a novice, yet how can we value an expert whose opinions contradict human physiology? Such conditioned beliefs are entirely subjective and, moreover, could harm human health. A new evaluation of expert knowledge on the effects of architectural form comes from scientific data, and no longer from the accepted architectural narrative [40–43]. Today, architectural knowledge as taught in the schools is never exposed to verification and is validated instead by tacit messages [44–47].

The literature and media unfortunately prejudice opposite opinions on how to design building façades. This makes an analysis of reactions to different façades unnecessarily problematic. Ordinary persons react spontaneously through their body’s evolved biological responses. Labeling as “novices” people with unsullied neurological sensitivity biases and skews the situation. Labeling individuals who diverge from the biological basis of beauty because their training suppresses human neurological responses as “experts” endows them with an undeserved authority. Those “experts” falsely condemn natural reactions to buildings as due to ignorance.

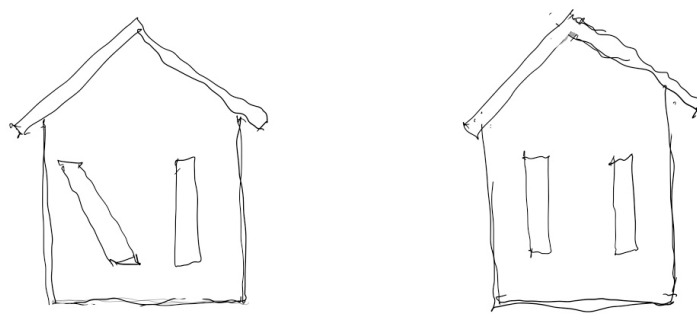
### *1.6. Attractive, Engaging Façades Are the Key to the Lively Pedestrian City*

As argued by Christopher Alexander and Jan Gehl, the heart of the city must encourage pedestrian use. To do so, the façades surrounding and defining urban spaces must offer informational interest and positive-valence emotional feedback. Otherwise, no pedestrian wishes to occupy that open space; and will either avoid it or traverse it as quickly as possible. The informational content of urban space has been treated in depth in the literature [48–55]. Contrary to some postulates on how urban space is thought to work, the attractiveness of the enveloping façades plays a crucial role in the success of the space itself. This goes for urban plazas just as much as ordinary streets.

Bringing in generative AI as an investigative tool opens up interesting possibilities for further research. The results derived in this paper go beyond the simple aesthetics of building façades, by contributing in a major way to how a city defines its pedestrian realm. People feel that they belong to a city only if they connect emotionally with its façades [56–59]. Obsessed with efficiency, engineering, materials, and tectonics, architects and planners apparently forgot this necessary mechanism. The profession does not yet prioritize a basic aspect of design that cooperates with urbanism to improve cities.

## 2. ChatGPT Evaluates Window Preferences Using the Properties of Living Geometry

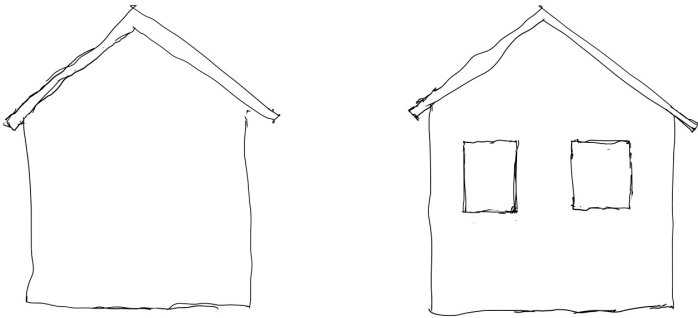
The goal is to evaluate the visual impact of experiencing windows on a building's façade from the outside. This study is not concerned with the view through a window from the inside. Ten line drawings of window designs and alignments in a façade were prepared to illustrate the simplest geometrical features through contrasting pairs. Each pair was presented to ChatGPT 4.5 for evaluation using Christopher Alexander's 15 fundamental properties (with an uploaded list given in the "Supplementary Materials" at the end of this paper). Figures 1 to 10 below were used in this AI experiment.



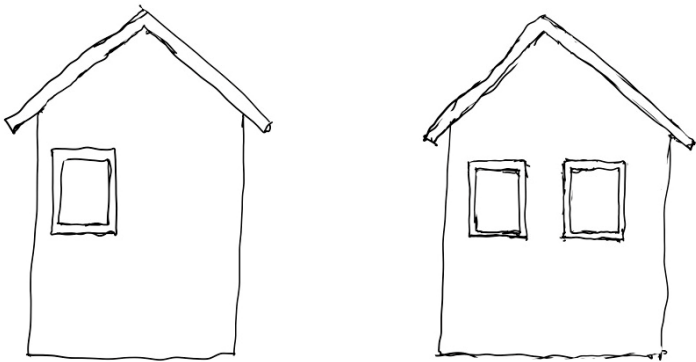
**Figure 1.** Two narrow windows in a façade. Drawing by the author.



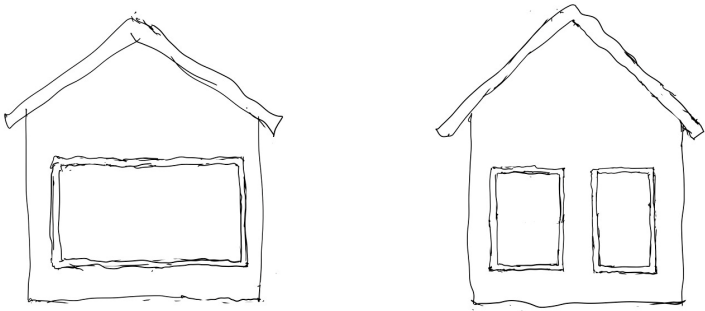
**Figure 2.** Two windows defining contrasting symmetries. Drawing by the author.



**Figure 3.** Either none or two windows in a façade. Drawing by the author.



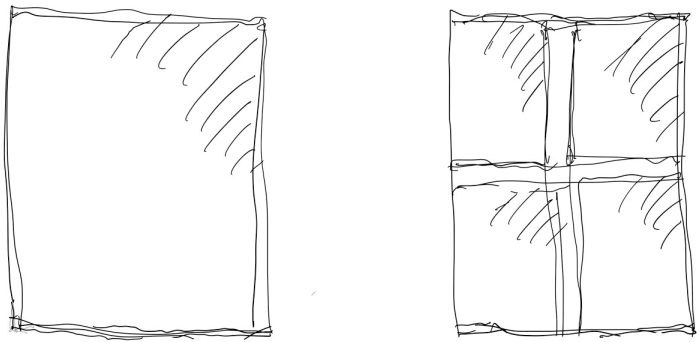
**Figure 4.** One or two windows with thin frames. Drawing by the author.



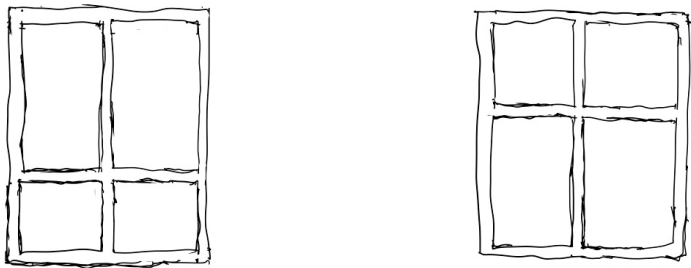
**Figure 5.** A picture window versus two windows of the same height. Drawing by the author.



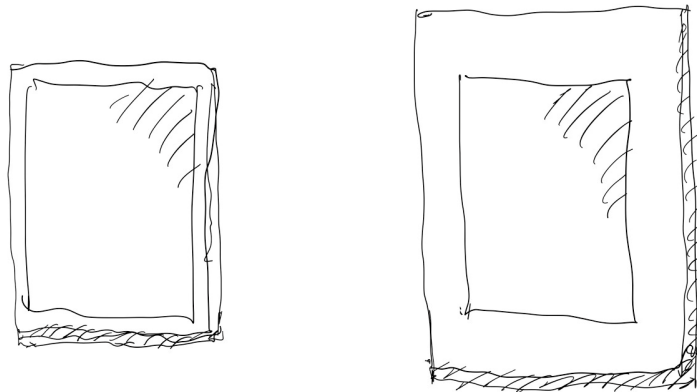
**Figure 6.** Horizontal or vertical windows. Drawing by the author.



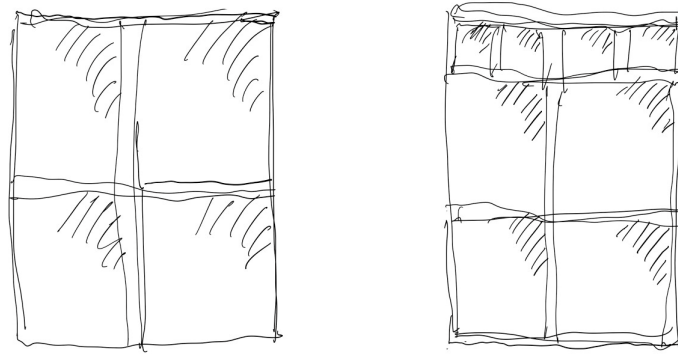
**Figure 7.** Windows with and without muntins. Drawing by the author.



**Figure 8.** Muntins in two different proportions. Drawing by the author.



**Figure 9.** Thin versus wide window frames. Drawing by the author.



**Figure 10.** Muntins subdivide windowpanes to define smaller levels of scale. Drawing by the author.

ChatGPT's answer for this experiment is reproduced below for the specific instance of Figure 1. The text details how the software deals with the question.

Prompt to ChatGPT 4.5: "Use the uploaded list of Christopher Alexander's 15 properties to evaluate the comparative degree of living geometry in the attached pair of figures. Find how each property is present in the figure on the LHS compared to the RHS figure, and note which side wins. Then give the result as a double sum ( $m, n$ ) for the respective counts of properties:  $m$  = total for the winning properties for the LHS, and  $n$  = total for the winning properties for the RHS."

Answer: "Based on the detailed description of Christopher Alexander's 15 fundamental properties, the comparative evaluation of the attached pairs of figures yields the following results. Pair shown in Figure 1:

1. Levels of Scale. LHS: Not clearly present. RHS: Not clearly present. Winner: Neither.
2. Strong Centers. LHS: Disrupted and weak. RHS: Clearly defined by symmetrical windows (strongly present). Winner: RHS.
3. Thick Boundaries. LHS: Thin boundaries. RHS: Thin boundaries. Winner: Neither.
4. Alternating Repetition. LHS: Irregular openings, weak. RHS: Simple repetition, no clear alternation. Winner: Neither.
5. Positive Space. LHS: Fragmented and incoherent. RHS: Clearly coherent (strongly present). Winner: RHS.
6. Good Shape. LHS: Irregular and fragmented. RHS: Clearly coherent and symmetrical (strongly present). Winner: RHS.
7. Local Symmetries. LHS: Clearly broken. RHS: Clearly symmetrical (strongly present). Winner: RHS.
8. Deep Interlock and Ambiguity. LHS: Weakly present. RHS: Simple form, no interlock. Winner: Neither.
9. Contrast. LHS: Asymmetric and clashing (not strong). RHS: Minimal contrast. Winner: Neither.
10. Gradients. LHS: Not present. RHS: Not present. Winner: Neither.
11. Roughness (informal coherent repetition). LHS: Informal but irregular and asymmetric (thus weak). RHS: Informal coherent lines (strongly present). Winner: RHS.
12. Echoes. LHS: No echoes. RHS: Simple echoes present in vertical shapes (weak). Winner: Neither (weak).
13. The Void. LHS: No coherent void. RHS: Simple central void slightly present (weak). Winner: Neither.
14. Simplicity and Inner Calm. LHS: Disrupted, fragmented. RHS: Clearly calm and coherent (strongly present). Winner: RHS.

15. Not-Separateness. LHS: Elements fragmented and separate. RHS: Connected and coherent (strongly present). Winner: RHS.

Results: LHS: 0 total. RHS clearly wins: properties (2,5,6,7,11,14,15) = 7 total.

Final result: (LHS, RHS) = (0,7)."

These results reflect significant differences in living geometry between the two sides in each pair, as per the definitions of Christopher Alexander's 15 properties. They are surprisingly accurate, given the deliberate simplicity of the figures. The 15 properties were meant to analyze coherent complexity in artifacts and structures, which these rough sketches hardly possess. The total counts for all the 10 figures are listed in Table 1 in Section 4 below.

Readers might find these results of interest, yet the point of this paper is broader: to introduce a simple yet powerful method to do similar analyses. Using large-language models to carry out substantive research offers an opportunity for anyone wishing to undertake such a project. There is no overhead; results are immediate; the experiments can be adjusted on the fly; the investigation can become an iterative procedure using feedback to improve accuracy. Just as important, everyone can very easily check another group's results and replicate their data. The only factor of concern is to use the correct prompt engineering, an art that is only now being developed.

A final note on the Figures. When conducting visual surveys with human subjects, especially in choosing between a pair of similar figures, the experimenters must usually account for Left-Right bias. This effect is due to reading in the West from Left to Right [60]. Mitigating any inherent L-R bias can be accomplished by switching some of the pairs so that the "better" choice is not consistently on the RHS, as it is here. However, as these figures were processed by a large-language model, it was not felt necessary to resort to any tricks to avoid inherent bias that is a specifically human factor.

### 3. ChatGPT Evaluates Window Preferences from Ten Emotional Responses

A second AI experiment was performed with the goal of introducing an emotion-based tool for judging the windows in the 10 figures. The separate results coming from emotion and from geometry could then be compared.

Prompt to ChatGPT 4.5: "Now do a different measurement of the same 10 figures in the already attached paper using 10 cognitive-emotional criteria. Evaluate the window arrangements in each pair shown in figures 1 to 10 to compare probable cognitive and emotional responses. Do this independently for the following ten criteria. Which one of the pair generates a greater feeling of beauty; calmness; coherence; comfort; empathy; intimacy; reassurance; relaxation; visual pleasure; well-being. Present the results as a pair of numbers (LHS, RHS) where LHS is the sum total of the preferences for the left figure, and RHS is the sum total of the preferences for the right figure. Give me a table of the final sums, and one detailed description of the analysis for Figure 1 only."

ChatGPT 4.5: "Here is the detailed analysis for Figure 1, based on the ten cognitive-emotional criteria. Cognitive-Emotional Evaluation (LHS vs. RHS).

1. Beauty: The RHS is symmetrical and balanced, strongly preferred for beauty. (RHS wins).
2. Calmness: The RHS's symmetry induces calmness; the LHS appears fragmented and stressful. (RHS wins).
3. Coherence: RHS clearly presents coherent geometry; LHS is irregular and lacks coherence. (RHS wins).
4. Comfort: RHS offers visual stability and predictability, which is comforting. (RHS wins).
5. Empathy: RHS's harmonious form fosters a feeling of empathy; LHS does not. (RHS wins).
6. Intimacy: RHS symmetrical windows suggest intimacy and human scale; LHS does not. (RHS wins).
7. Reassurance: RHS symmetry and order reassure viewers; LHS arrangement creates unease. (RHS wins).

8. Relaxation: The symmetry of the RHS strongly promotes relaxation; LHS disrupts relaxation. (RHS wins).
9. Visual Pleasure: RHS’s well-organized form provides visual pleasure; LHS feels visually unpleasant. (RHS wins).
10. Well-being: RHS aligns with perceptions of balance and psychological comfort; LHS negatively impacts sense of well-being. (RHS wins).
- Total for Figure 1 (Cognitive-Emotional Criteria): LHS = 0, RHS = 10.”

Results of analyzing all 10 figures are listed in Table 2 in Section 4 below. This evaluation tool is even simpler to use, since the 10 emotional responses upon which it is based do not need to be explained to the software. ChatGPT draws upon a vast databank documenting human responses to visual patterns. It is worth remarking that, because of the sheer numbers involved, popular opinion overwhelms by far any responses due to architectural conditioning.

4. Results: Emotional Preferences Correspond to Geometrical Qualities in Window Design and Positioning

The results from ChatGPT 4.5 evaluating the ten figures using geometry are listed in Table 1, below.

**Table 1.** Comparative evaluation of pairs of window designs in a façade using Christopher Alexander’s 15 fundamental properties of living geometry. The totals indicate how many properties are strongly present in each façade of the pair (Left-Hand Side—LHS vs. Right-Hand Side—RHS), clearly showing the consistent preference for designs on the RHS across all ten figures.

Figure No.	LHS Score	RHS Score
1	0	7
2	2	6
3	0	6
4	1	6
5	1	7
6	1	6
7	0	7
8	2	7
9	0	7
10	0	7

These results must be joined by the separate evaluations of the 10 figures using the emotion-based prompt, listed in table 2.

**Table 2.** Comparative evaluation of pairs of façade window designs using responses to the ten emotional qualities. The totals indicate how many properties are strongly present in each façade of the pair (Left-Hand Side—LHS vs. Right-Hand Side—RHS). The comparative totals indicate the number of positive emotional responses (beauty, calmness, coherence, comfort, empathy, intimacy, reassurance, relaxation, visual pleasure, well-being) clearly favoring the right-hand side (RHS) window arrangements across all ten figures.

Figure No.	LHS Score	RHS Score
1	0	10
2	2	8
3	0	10
4	1	9
5	1	9

6	1	9
7	0	10
8	2	8
9	0	10
10	0	10

The coincidence of values in the columns for the LHS scores in both Tables 1 and 2 is not a misprint. It is curious to discover that the emotional evaluation of the 10 simple figures somehow seems more robust than when done using the geometrical criteria.

The experimental conclusions are that, overwhelmingly, the more traditional of each pair of windows in each of the figures is preferred. Those are represented by the RHS figures in all cases. Since the two distinct AI experiments reinforce each other, these results cannot be dismissed as some artifact of the software or opinion of the author.

5. Discussion: The Body Is Hard-Wired to Seek Specific Patterns in the Visual Environment for Survival

This paper applied the large-language model ChatGPT to determine how the geometry of building façades — specifically, window design and composition — affects users. In what amounts to a pilot study, even the simplest variations turn out to influence design choices. Adaptive design that promotes cognitive and psychological health must take these findings seriously.

Readers may reasonably question how ChatGPT, being fundamentally a text-based model, can determine emotional feedback defined by the ten descriptors (beauty, calmness, coherence, comfort, empathy, intimacy, reassurance, relaxation, visual pleasure, and well-being). A large-language model operates by predicting textual responses based on statistical patterns derived from extensive training on vast datasets. The database encompasses multiple sources of written material. ChatGPT’s assessments of emotional descriptors do not originate from direct sensory experiences, but rather from documented language patterns describing human emotional responses.

This tool has clear limitations. Unlike direct neurological or physiological measurements—such as biometric sensors or eye-tracking studies, which register emotional and physiological states—ChatGPT’s emotional evaluations are secondhand abstractions. Ideally, therefore, these AI-generated evaluations should be complemented by empirical validation.

Summarizing these findings leads to understandings in the list below:

1. ChatGPT turns out to be very useful in evaluating window design and placement using either emotional or geometrical criteria.
2. Results from emotional choices turn out to agree remarkably well with choices using the elements of living geometry.
3. Referring to work by other authors, large-language models are unexpectedly successful in discovering general human preferences.
4. Architects are trained to privilege designs that were revealed as non-optimal for cognitive and psychological health.
5. The ten emotional criteria introduced here turn out to be very efficient when combined into a diagnostic tool for healthy design.

What is remarkable is the consistency of choices, which uncovers a profound split between what the majority of the population prefers, and what the architectural industry is giving us. A survey of standard window typologies reveals that the building and construction industries have settled on mass-producing archetypes that fail the present tests. And yet nobody seems to raise the issue, as societies the world over accept these window designs without questioning them. It is difficult to

explain this phenomenon taking place in a market-driven economy except by reference to a mass movement.

The controversial nature of these results was already mentioned. How do we interpret the finding that dominant architectural culture prefers designs that rank as less desirable for human health? This phenomenon is not only confined to an architectural elite of schools, prestigious prizes, and specialized discourse, but it is accepted by the general public. Both government and private clients approve and commission designs that embed precisely those geometrical characteristics that this paper questions. Such geometries are identified as “cutting-edge” and “progressive” and are selected to implement.

Contemporary architecture, going back to early Modernism at the beginning of the 20<sup>th</sup> Century, has favored geometries less supportive of psychological health. Addressing this question needs to delve into economic, historical, and ideological factors to deepen the analysis. Such an investigation is beyond the scope of the present paper, however.

Architects would never express their intentions in terms of “creating ugliness”. Education and professional training have systematically conditioned them to prioritize certain values over biologically-informed and human-centered approaches. Specifically, contemporary and modernist architectural theories—rooted in abstraction, conceptual provocations, minimalism, and novelty—strongly reject conventional notions of beauty. As a result, the architectural profession equates aesthetic innovation with a break from what it perceives as historical styles.

Many architects have internalized the notion that genuine artistic creativity involves disruption and provocation rather than empathetic resonance and psychological nourishment. Thus, a deeply entrenched ideological commitment rejects objective beauty that aligns with biological and neurological criteria. However, if personal creativity were the dominant factor, we would occasionally witness beautiful windows being produced, at least accidentally. Yet contemporary industrial windows are consistently standardized, uniformly ugly, and appear intentionally designed to minimize emotional and psychological engagement.

Clearly, a major program of future research is necessary to understand what is happening with architecture. If fashionable trends indeed contain unhealthy elements, then those must be identified by scientific means, and the public alerted to the fact. The present experiments with generative AI are only an indication of what is possible, meant to encourage extensive medical trials on how building façades affect people’s health. Academia and the profession have to change their perspective, from a detached concern with abstract form-making, to measuring how shapes and spaces influence the human body.

## 6. Conclusions

Ten rough sketches of similar window pairs were analyzed by the large-language model ChatGPT 4.5. Examples on the LHS of each figure deliberately allude to the types of windows and their placement favored by dominant architectural culture. Those were contrasted with windows from more traditional typologies: examples on the RHS of each figure. ChatGPT invariably picked all the traditional one as being more desirable. Some readers might find this result disconcerting; however, two independent generative AI experiments reinforced each other. Window preferences are explained by emotional responses, as well as from the human body’s innate preference for living structure. Human evolution has hard-wired those mechanisms.

The present pilot study can provide concrete recommendations for architects, policy-makers, and urban planners on how to implement these findings practically. It is a simple matter to revise standard window designs that are mass-produced globally. Once the market begins to demand the new (actually, traditional) archetypes, then industry will follow suit. But the public will not shift its taste until it understands the health benefits from doing so. For this reason, future research is needed using human-subject experiments in real-world scenarios, especially longitudinal studies of health outcomes in complex urban contexts.

In conclusion, the industry has standardized windows to systematically exclude known sources of biological resonance and emotional nourishment. A critical but overlooked factor is societal habituation. After decades of exposure to monotonous, uncompromising façades and window designs, public perception of what constitutes a healthy building aesthetic has shifted. Society has become resigned to these emotionally-deadening and sometimes unsettling designs. People may subconsciously avoid acknowledging the extent of systemic harm to avoid cognitive dissonance and feeling helpless. Thus, there is minimal pressure from the market to change existing practices.

**Supplementary Materials:** Detailed descriptions of Christopher Alexander's 15 fundamental properties can be downloaded at: [www.mdpi.com/xxx/s](http://www.mdpi.com/xxx/s). It is useful to upload this list when asking a large-language model to investigate visuals for these properties.

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**Acknowledgments:** Ann Sussman asked the author to sketch pairs of windows for her to analyze using emotion-detection sensors and eye tracking. Those sketches are used here for an independent analysis using ChatGPT 4.5. Thanks to her for triggering this investigation.

**Conflicts of Interest:** The author declares no conflicts of interest.

## Abbreviations

The following abbreviations are used in this manuscript:

AI	Artificial Intelligence
RHS	Right-hand side
LHS	Left-hand side

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