
| RESEARCH ARTICLE

Symbolic Alienation and Semantic Failure: A Reflection on the Homogenization of Chinese New Energy Vehicle Design

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| ABSTRACT

Against the backdrop of the "New Four Modernizations" wave, China's new energy vehicle industry, while witnessing explosive growth in production capacity, has fallen into a severe dilemma of design homogenization. Based on Baudrillard's theory of "symbolic consumption" and Krippendorff's product semantics, this paper points out that current automobile design is undergoing alienation from "functional tools" to "intelligent simulacra". The visual paradigms represented by narrow-eyed headlamps and oversized central control screens are essentially rampant symbol stacking, which results in the impoverishment and failure of product semantics. This paper dissects the logic of symbol appropriation behind Xiaomi Auto, and criticizes how supply chain dividends and algorithmic convergence have led to the annihilation of brand uniqueness and the alienation of users' real needs. The study concludes that automakers must transcend the competition of visual symbols, reshape perceived quality from the perspective of embodied cognition, build a differentiated sensory moat and cultural narratives, and achieve a strategic leap from "cost performance" to "brand value".

| KEYWORDS

Symbolic Alienation; New Energy Vehicle Design; Homogeneity; Product Semantics; Brand Identity

| ARTICLE INFORMATION

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1. Introduction

While the ongoing electrification transformation has driven a dual leap in technology and production capacity of China's NEV industry, the pressing issue of design homogenization behind this prosperity has become increasingly prominent. The market is facing a paradox: while the underlying technology is advancing with each passing day, the design language as the carrier of brand identity is becoming increasingly homogenized. This is reflected in the stereotyped narrow-eyed headlamps, fastback profiles, through-type taillights, the overuse of large screens, and the disappearance of physical buttons. The solidification of this visual paradigm not only causes aesthetic fatigue, but also reduces the inherent value of design itself. In response to this phenomenon, this paper conducts a reflection based on Jean Baudrillard's semiotic political economy and Klaus Krippendorff's product semantics. Some scholars have pointed out that the symbolic consumption in the current NEV field has shown obvious characteristics of "involution". The automakers' homogeneous pursuit of visual symbols is essentially a passive catering to the symbolic logic of the consumer society, rather than active brand value construction^[1]. Current automobile design is undergoing alienation from a "functional tool" to an "intelligent simulacrum", which separates itself from real user experience, degenerates into superficial visual symbol stacking, and leads to the impoverishment of product semantics. This paper conducts an in-depth analysis of the "symbol appropriation strategy" represented by Xiaomi Auto, and reveals how supply chain dividends and algorithmic convergence jointly undermine brand uniqueness and ignore users' real needs. This paper argues that to break the involution, automakers must abandon the superficial competition of visual symbols, improve perceived quality from the

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perspective of embodied cognition, and find a path from the "price war" to the highland of "brand value" through differentiated sensory experience and cultural narratives.

1. The Picture of Symbolic Alienation in NEV Design

1.1 The Fixation of "Signifier" in Visual Paradigm and Semantic Impoverishment

China's NEV market is presenting a contradictory pattern of prosperity: while technology is developing and upgrading at a high speed, the design language has rapidly evolved into a general scheme with low recognition. From the perspective of Baudrillard's semiotic political economy, this phenomenon can be profoundly explained: in a consumer society, the use value of goods is increasingly occupied by "sign value", and consumption is no longer to meet consumer needs, but to obtain the social status or identity approval represented by symbols. Under this logic, automobile design has undergone essential changes. The abuse of narrow-eyed split headlamps, through-type taillights, hidden door handles, and the large central control screen in the interior has constituted the current standard visual paradigm of NEVs. This minimalist style originally originated from the pursuit of aerodynamics (drag coefficient, Cd value), but now it has become a pure "signifier". These design elements no longer take functions such as lighting or door opening as the core design considerations, but simply act as a visual symbol of "I am an intelligent electric vehicle". As Klaus Krippendorff, a leading scholar in design studies, pointed out in *Product Semantics*, design should convey meaning through form. However, when all brands adopt the same set of formal language, "entropy increase" occurs in product semantics, leading to the ambiguity and failure of meaning. This generalized visual paradigm not only dispels the design personality of different brands, but also makes China's NEV design fall into the awkward situation of "having form but no style, having symbols but no culture", making it difficult to form a design language system with local recognition^[2]. This self-replication of symbols makes the market fall into aesthetic fatigue where "it is difficult to distinguish brands beyond 100 meters", and the innovation of design is stifled by the risk-averse thinking that complies with industry standards.

1.2 The Simulacrum of Intelligence under "Screen Stacking"

The alienation of interior design is manifested in a more radical "de-physicalization". The disappearance of physical buttons, the popularization of column shifters, and the crude small instrument screens (dubbed "Yadi screens") have become mainstream configurations, while the oversized central control screen stands abruptly in the center of the cockpit. This design trend is packaged by the industry as "intelligentization" and "sense of technology", but from the perspective of design ethics, it constitutes what Baudrillard called "simulacra" — that is, the simulation and substitution of reality without an original. Automakers simulate "intelligence" by stacking screen sizes and improving resolution, simplifying the complex embodied behavior of driving into two-dimensional touch operations. This abuse of screens not only destroys the spatial aesthetics and material hierarchy of the interior, but also causes a deep nihilism of experience. Design no longer focuses on the driver's tactile feedback, blind operation performance and spatial wrapping feeling, but focuses on how to display more information flow on the screen. This design tendency of "cell phoneization" of automobiles essentially covers up the laziness of design thinking and the saving of mold opening costs, sacrificing the depth and warmth of human-vehicle interaction.



Figure 1 Through-type taillight design of new energy vehicles (from the Internet)

2. In-depth Critique of the Multidimensional Harms of Homogenized Design: Symbolic Alienation and Semantic Failure

2.1 The "Integrated" Design Approach of Xiaomi Auto from the Perspective of Semiotic Political Economy

The entry and success of Xiaomi Auto SU7 provide an excellent analytical sample for this study. The public opinion field is full of controversy about its "tribute" to Porsche, but it is too superficial to only stay at the moral accusation of "plagiarism". From the perspective of Jean Baudrillard's semiotic political economy, Xiaomi has actually adopted a highly efficient "symbolic appropriation" strategy. Baudrillard pointed out that in late capitalist society, the "utility" of goods gradually retreats to a secondary position, while the "sign value" — that is, the social status, taste and class difference represented by goods — has become the main driving force of consumption. Xiaomi Auto has a deep insight into this logic: in a market with highly homogenized design and high original risk, as a latecomer brand, the cost of educating users to accept a new set of design language is extremely high. Therefore, Xiaomi did not try to create new signifiers, but accurately extracted the widely recognized symbols of "speed", "performance" and "class" from ultra-luxury brands such as Porsche and McLaren (such as specific body proportions, wheel arch curves, and front face posture). By transplanting these high-value symbols representing "million-level value" to industrial products at the 200,000-yuan level, Xiaomi completed a perfect "symbolic dimensionality reduction strike". The inherent essence of this approach is to reduce user cognitive costs and aesthetic risks with the help of mature symbolic capital. In an era of information overload, consumers tend to embrace "highly deterministic" symbolic consumption, even if the aesthetic is "borrowed". Xiaomi's success shows that in the current Chinese automobile market, when in-depth original design cannot be immediately converted into symbolic premium, "integrated design" has become the most efficient commercial method. However, the victory achieved based on "simulacra" is tactical rather than strategic, short-term rather than long-term. Although it has gained sales in a short period of time, it has further intensified the "symbol bubble" of the entire industry, degenerating design from "creating meaning" to "pasting symbols", which will cause further loss of the subjectivity of Chinese automobile design.



Figure 2 Integrated design clues of Xiaomi SU7 (from the Internet)

2.2 The Disappearance of Brand Identity and the "Entropy Increase" of Product Semantics

The most serious harm caused by industry homogenization is the demise of brand identity and the "entropy increase" of product semantics. The symbolic appropriation of Xiaomi Auto is a popular case of a single brand, but the convergence of visual design across the industry will make all brands lose their own characteristics together.

2.2.1 From "Strong Semantics" to "Weak Semantics": A Product Semantics Perspective

Klaus Krippendorff, a well-known expert in design theory, proposed that design is not only to create functions, but also "to endow artificial products with due meaning". Product form can be regarded as a language to inform users of "who I am". In the golden age of internal combustion engine (ICE) vehicles, leading brands have established highly recognizable "product semantic assets" through long-term accumulation. BMW's "double kidney grille" and "Hofmeister kink" are not only physical parts for heat dissipation and ventilation, but also important signifiers of "sports and handling"; Rolls-Royce's "Parthenon" grille conveys the

meaning of "power and dignity" through the solemnity of vertical lines. These design elements have built a strong visual language framework, so that users can still clearly identify the brand even when the logo is covered. The core value of product semantics is to establish an emotional connection and cognitive consensus between brands and users through stable design language, and the continuous weakening of semantics will directly lead to the continuous loss of brand design assets^[3]. In the current context of NEV design, this "strong semantics" is rapidly disappearing. In order to pursue the ultimate drag coefficient (Cd value) to obtain a slight improvement in battery life, automakers generally adopt the logic of "wind tunnel determines shape", which results in the extreme convergence of front face design: the closed grille greatly reduces brand recognition, the split narrow-eyed headlights reduce the sense of eye contact, and the highly uniform fastback shape eliminates the difference in body contour.

2.2.2 Visual Entropy Increase: The Elimination of Brand Uniqueness

This phenomenon leads to "semantic entropy increase" in the field of automobile design. In a thermodynamic system, entropy increase indicates the disorder and chaos of the system; in the field of design, semantic entropy increase represents the disappearance of differences and the homogenization of information. When more than ten brands such as NIO, Xpeng, Li Auto, and IM Motors all adopt the combination of "through-type light strip + closed front face + hidden handle", these design elements become "general symbols", which no longer represent a specific brand, but only point to the abstract category of "electric vehicles". Brands have lost their visual anchors, plunging consumers into a dilemma of choice.

2.2.3 The Collapse of Brand Equity and the Inevitability of Price Wars

According to David Aaker's brand equity theory, brand association is the core of brand equity. If design cannot provide unique association, the brand's premium ability will collapse accordingly. For new power brands with a short establishment time, this is equivalent to long-term damage to brand equity. When technical parameters (such as 0-100km/h acceleration time, battery range, chip computing power) gradually converge due to supply chain dividends, and design loses its recognition, consumers cannot generate emotional projection, and market competition will inevitably evolve into the most primitive "price war". The collapse of HiPhi Auto is a warning: although it has a cool mecha shape, its design has not been converted into stable brand recognition by consumers due to the lack of clear and coherent brand semantic core. Homogenization is not only a simple lack of aesthetics, but also a problem of business strategy. This phenomenon exposes the collective aphasia of Chinese automobile brands in self-narration.

2.3 The Dwarfing and Instrumentalization of Design Value

In the wave of homogenization, the value of the design discipline itself is being dwarfed. Design should be a bridge connecting technology and humanities, and a creative activity to solve problems. However, in the current industry context, design has been alienated into an execution tool for "configuration list". The publicity focus of automakers has shifted from "styling aesthetics" and "design philosophy" to quantifiable industrial parameters such as "screen size", "pixel density", and "number of lamp beads". This kind of thinking reduces design to a vassal of engineering data, and designers lose the power to define products and are reduced to "artists" or "stylists". When design no longer pursues the resonance of the soul, no longer explores the deep logic of form and function, but only meets the defensive demand of "competitors have it, I must have it too", the innovative vitality of the industry is stifled. What is more terrible is that this instrumental thinking has spawned a large number of "pseudo-innovations". For example, some models blindly stack "smart light curtains" or special-shaped steering wheels. Although they look gorgeous on the parameter list, they actually push up the BOM cost and maintenance expenses, and lack interactive value in actual use. This phenomenon of "innovation for innovation's sake" is exactly the embodiment of the loss of design value — design no longer serves experience, but serves traffic and marketing gimmicks.

2.4 The Alienation and Neglect of Users' Real Needs from the Perspective of Norman's Psychology

The essence of homogenization is "production and marketing-centered" rather than "user-centered". This inversion of design logic directly leads to the alienation of users' real needs, even at the cost of safety. The theory of Donald Norman, a master of cognitive psychology and design, provides us with a powerful weapon to criticize this phenomenon.

2.4.1 Hidden Door Handles: The Lack of Affordance

Norman put forward the concept of "affordance", which means that the physical characteristics of an object should directly imply its usage method. The traditional door handle provides a clear visual signal of "pullable" with its convex physical image, which is a design with almost no learning cost. However, the current popular hidden door handles forcibly cancel this affordance in order to pursue the so-called "sense of technology" and reduce the drag coefficient. When the handle retracts into the door, it

interrupts the first layer of interaction between people and the car, and users will fall into the dilemma of "not knowing where to start". More seriously, this design has a great safety risk that it cannot pop up in the case of freezing in cold weather or power failure in traffic accidents, which is a typical design that violates user experience. It violates the basic ethical norm that design should be "people-oriented", but it has been promoted by the whole industry because it caters to the aesthetic paradigm of "technology symbols".

2.4.2 Full Touch Interaction: The Chaos of Signifiers

The replacement of traditional physical buttons with screen touch interaction in interior design is one of the important reasons for the poor user experience of vehicles. In order to achieve a visually minimalist style, automakers hide many high-frequency usage scenarios (such as air conditioning adjustment, rearview mirror adjustment, glove box opening) in the secondary or even tertiary menus of the car screen. Good interaction design requires clear "signifiers" to indicate the position and status of the operation. Physical buttons enable drivers to perform "blind operation" through position memory and tactile feedback, while the full touch screen causes the lack of tactile dimension, forcing drivers to call visual resources to verify whether the operation is successful. This not only greatly increases the cognitive load of the driver, but also causes distraction and increases the probability of accidents. This practice of sacrificing safety shows the neglect of users' real needs by automakers: they blindly highlight the "intelligent" symbol similar to mobile phones, rather than emphasizing the convenience, safety and control experience in real dynamic driving scenarios^[4].



Figure 3 Hidden door handle design of new energy vehicles (from the Internet)

3. Industrial Dilemma under Efficiency Priority and Future Exploration

3.1 Industrial Dilemma under Efficiency Priority

3.1.1 Supply Chain Dividends and Time Pressure

At present, China has the world's largest, most mature and most responsive NEV supply chain system, which is the core dividend supporting Chinese automakers to overtake in the global market, but also a major shackle on design independence and originality. For example, Tier 1 suppliers often provide very similar basic hardware solutions to various OEMs in order to share the remaining mold opening and R&D costs. Those ready-made general LED matrix modules and size-standardized integrated LCD screen solutions provide major automakers with a scheme to control costs and reduce trial and error risks. When the procurement department of an automaker finds that directly applying the supplier's mature large screen solution and module can greatly reduce the vehicle's R&D cycle and cut BOM costs, adhering to original design from scratch seems extremely

unworthy of investment. What is more serious is that the current Chinese NEV market has changed from the development rhythm of traditional mechanical industry to that of "fast-moving consumer goods" similar to smart phones, and a NEV is gradually defined as a fast-moving consumer product. Unlike the long R&D cycle of up to 48 or even 60 months of traditional luxury brands, NEV brands are accustomed to greatly compressing the R&D cycle to an extreme 12 to 18 months. Under the survival anxiety of extreme involution and vicious competition in the current automobile market, the entire R&D team will be led to a highly tense state of fatigue. Enterprises have no patience, sufficient time and trial and error space to carry out in-depth styling proportion deliberation and ergonomic verification. Therefore, directly copying the "hit" schemes with obvious symbolic characteristics that have been verified by the market within the scope of compliance has become the safest and most commercially logical defensive strategy in the eyes of automakers, but it also has a significant negative impact on automobile design from the physical hardware level^[5].

3.1.2 The Loss of Designers' Decision-making Power and Algorithmic Convergence

The current NEV industry advocates the transformation of the attribute of vehicles to "large mobile intelligent terminals", and the power structure within automakers has also undergone earth-shaking reconstruction. In the golden age of traditional fuel vehicle R&D, the styling design center often had a high veto power in the product definition stage, and designers led the vehicle form with their keen artistic intuition and insight into brand history. However, under the current prevailing "Internet thinking car building" mindset, product managers have replaced the highest decision-making power of design with a large number of background data algorithms. When conducting product research, modern automakers often fall into a blind superstition of "data portraits". They rely heavily on massive online user surveys, item-by-item comparative analysis of competitor configurations, and aesthetic preference models generated based on algorithms to reversely define products. However, this seemingly objective data cannot balance the decision-making of designers, and their objections about the loss of the brand's unique assets are gradually ignored. Although this extreme "data-driven" decision-making mechanism is feasible in terms of statistical principles, it covers up a serious logical trap: data does not have forward-looking, and data is only a lagging response to what has happened. Excessive reliance on data to interfere with design decisions will essentially make brand assets more mediocre. It cannot predict or even create the next wave of aesthetics as keenly as a talented designer. It can only simulate mass production of mediocre industrial behaviors supported by a large amount of past data^[6].

3.2 Future Exploration of Perceived Value Leap

3.2.1 Technology-driven Form Evolution: V2G and Electronic Rearview Mirrors

Excellent design advances with technology, rather than staying at the decorative replication of superficial visual symbols. Take the emerging V2G (Vehicle-to-Grid) technology as an example, this technology is essentially completely transforming the traditional definition of automobiles as a single consumption-type industrial product into a huge mobile energy terminal that can interact with the urban power grid. In response to this profound attribute change, designers should deeply think about how to endow the invisible physical process of charging and discharging with a strong sense of ritual in reality. For example, we can innovate the external interactive light language, treat the light as a breathing individual, and use the rhythm of light, the sudden change and circulation of color to smoothly perform the flow state of energy, so that the light truly becomes a concrete carrier of energy visualization. In addition, the implementation and legalization of CMS (Camera Monitor System) regulations have provided more possibilities for the complete liberation of automobile side design. Electronic rearview mirrors not only reduce the vehicle's wind resistance and improve energy efficiency, but also upgrade the rearview mirror, a purely functional component, into an important design element, providing more room for imagination for designers. Excellent design is to transform the distant and cold technology into a good user experience^[7].

3.2.2 Reshaping "Perceived Quality" from Multi-dimensional Tactile Sensation

As the competition in the automobile market has fully shifted from the brutal "incremental" stage to the more tragic "stock game" stage, it has been proved to be short-sighted and ineffective to continue to apply homogenized design language while ignoring the significance of brand assets. Brands should improve the warmth of interaction logic in multiple dimensions such as vision, hearing, touch and smell through multi-dimensional tactile sensation, so as to build a moat that cannot be easily imitated by competitors. This requires the core focus of design to shift from superficial visual stimulation to the "perceived quality" element that represents the highest integration of technology and experience. At the same time, the decision-makers and design teams of automakers should reflect on the fanatical and blind advocacy of anti-human "de-physicalization" in order to cater to the minimalist trend. We should not cancel physical interaction, but should systematically introduce rigorous "Haptic Design" into the interior design of the cockpit. Excellent design is never to replace the complex center console design with a screen, but to create a more scarce and luxurious high-level physical interaction experience in the era of standardization. Excellent cockpit

design will greatly reduce the user's learning cost and quickly get used to the blind operation of the vehicle's functions. When the driver's line of sight must be firmly locked on the road ahead, his fingers can accurately reach the metal function roller button in the center control area by virtue of muscle memory, and capture the advanced experience brought by each toggle. The material of the physical buttons in the car is skin-friendly, and each press will receive a crisp, firm and not loose micro-feedback like a top mechanical watch. The high-level interactive experience focusing on "perceived quality" is far more able to meet consumers' desire for real quality than simply stacking a screen. Excellent multi-dimensional tactile sensation is often hidden in the details: the dull and secure sound quality when the door is closed; the quiet and delay-free motor tuning when adjusting the seat; the pressing frustration of the interior buttons without slight looseness and with a sense of luxury. In the final analysis, in the face of the fierce competition and involution in the current market, automakers should reshape "perceived quality" from multi-dimensional tactile sensation and attach importance to experience design. Only in this way can Chinese NEV brands truly jump out of the low-dimensional price war and finally precipitate the core brand assets that can survive the industry reshuffle cycle^[8].

Conclusion

The "homogenization dilemma" of Chinese electric vehicle design is essentially a product of the excessive overwhelming of innovation logic by cost efficiency and symbolic value in the early stage of industrial development. Ensnared by supply chain convergence and algorithmic decision-making, the market is filled with soulless technological simulacra. As the industry shifts from "incremental competition" to the brutal "stock game", the path that solely relies on material stacking and imitation has fallen into the quagmire of price wars, and new value anchors are urgently needed. To break the involution, automakers should commit to reshaping their core competitiveness from three dimensions: first, reconstruct brand semantics, abandon the general minimalist symbols, and instead excavate unique totems with cultural depth such as "New Oriental Functionalism" to establish an exclusive visual identification system; second, return to "embodied cognition", correct the blind "de-physicalization" tendency, reshape the precise texture of touch and hearing at key interaction points, and build an inimitable moat of "perceived quality"; finally, revise the decision-making mechanism, be alert to the blind obedience to big data, enhance the voice and ethical review function of the design team, and encourage anti-intuitive innovation to lead rather than cater to the times. The future of Chinese automobile design must break the risk-averse thinking and endow design with higher strategic weight. Only through the deepening of cultural narrative and the return of sensory experience can Chinese brands complete the fundamental leap from a "manufacturing power" to a "brand power".

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