

Cognitive Dissonance to Brand Loyalty: Optimizing NEV Marketing Through Environmental Identity and Range Anxiety Mitigation – A Tesla-BYD Comparative Analysis

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Abstract: The rapid adoption of new energy vehicles (NEVs) hinges on resolving consumer cognitive dissonance between environmental aspirations and practical barriers. This study investigates how Tesla and BYD transform dissonance into brand loyalty by leveraging environmental identity and mitigating range anxiety. Through a mixed-method approach—analyzing consumer surveys (n=1,200) and corporate strategy documents—we identify distinct pathways: Tesla's premium branding converts eco-consciousness into status symbolism, while BYD's "Dynasty Series" cultural narratives reframe affordability as patriotic sustainability. Our findings reveal that range anxiety reduction (via supercharging networks or blade battery technology) mediates environmental identity's impact on trust by 37%. Crucially, Tesla's direct customer control model amplifies experiential assurance, whereas BYD's dealer partnerships enhance accessibility but dilute messaging coherence. The research proposes a Dissonance-to-Loyalty (D2L) Framework, demonstrating that targeted anxiety mitigation can increase repurchase intent by 24% for premium segments and 31% for mass markets. These insights optimize NEV marketing for divergent consumer psychographics amid subsidy reductions.

Keywords: Cognitive Dissonance, Brand Loyalty, Environmental Identity, Range Anxiety Mitigation, Comparative Marketing Strategy.

I. INTRODUCTION: THE NEV ADOPTION PARADOX: ENVIRONMENTAL INTENT VS. CONSUMER HESITATION

Global climate imperatives have accelerated consumer awareness of transportation emissions, with over 70% of surveyed individuals expressing environmental concern as a key motivator for considering new energy vehicles. Despite this intent, adoption rates lag significantly behind conventional vehicles, particularly in emerging markets. This paradox stems from unresolved practical barriers: range anxiety dominates consumer hesitation, cited in 68% of market studies as the primary deterrent, alongside charging infrastructure gaps and cost sensitivity. Industry leaders like Tesla and BYD exemplify divergent approaches to bridging this gap, yet systematic analysis of how their strategies convert ecological intent into purchase commitment remains underexplored. This disconnect between aspiration and action frames a critical challenge for sustainable mobility transitions.

Sustainable consumption inherently generates cognitive dissonance, a psychological tension arising when individuals hold conflicting beliefs—in this case, pro-environmental values versus perceived NEV limitations. Consumers experience dissonance when their environmental identity clashes with anxieties about vehicle reliability, cost, or convenience. Traditional marketing often exacerbates this tension by emphasizing ecological benefits while underaddressing pragmatic concerns. The automotive sector thus requires strategies that actively resolve dissonance through integrated solutions, transforming psychological friction into brand trust. This study positions cognitive dissonance theory as the lens to decode consumer ambivalence in high-involvement green purchases.

This research aims to achieve three interconnected objectives. First, it deconstructs how Tesla's premium ecosystem and BYD's cultural-affordable positioning differentially mitigate cognitive dissonance. Second, it quantifies the mediating role of range anxiety reduction in converting environmental identity into brand loyalty. Third, it proposes the Dissonance-to-Loyalty Framework, a novel model for segment-specific NEV marketing that prioritizes psychological barrier resolution over generic sustainability messaging. By empirically validating the nexus of consumer psychology, technology accessibility, and brand strategy, this work advances theoretical discourse on sustainable consumption while offering actionable pathways for industry practitioners navigating subsidy reductions.

II. LITERATURE SYNTHESIS

Environmental identity, defined as the extent to which individuals incorporate nature into their self-concept, increasingly predicts sustainable consumption. Empirical studies confirm its role in high-involvement purchases like new energy vehicles, where ecological values outweigh economic rationality. Clayton's identity theory posits that strong environmental identities trigger morally aligned behaviors, including NEV adoption. However, its influence remains moderated by contextual factors such as infrastructural access and social norms. Whitmarsh's cross-cultural analyses further reveal that environmental identity manifests differently across markets—acting as a status symbol in individualistic societies versus a collective duty in communitarian cultures. This variance underscores the need for segmented marketing strategies that align with identity expression modes. Gaps persist in understanding how automakers leverage this identity through brand narratives to override cost or convenience barriers.

Range anxiety—the fear that a vehicle's battery will deplete before reaching a charging point—represents the most cited psychological barrier to NEV adoption. Its operationalization extends beyond perceived range limitations to encompass charging infrastructure density, recharge time, and battery degradation. Standardized scales like the Range Anxiety Assessment Scale quantify it through multi-dimensional items assessing trip planning constraints and safety margin concerns. Egbue's longitudinal data demonstrates that range anxiety reduces purchase intent by 19–34%, disproportionately affecting women and rural populations. Crucially, its impact interacts with environmental identity: high eco-identity consumers tolerate greater anxiety thresholds, though only up to a critical inflection point. Despite technological advancements extending battery range, consumer perceptions lag, indicating that psychological mitigation requires communication strategies beyond technical specifications.

In disruptive markets like electric mobility, brand loyalty transcends transactional satisfaction to encompass ecosystem integration and value alignment. Oliver's loyalty framework identifies three pillars in NEV contexts: cognitive loyalty driven by technological trust, affective loyalty rooted in environmental ethos, and conative loyalty expressed through advocacy. Disruption intensifies the role of affective drivers, as seen in Tesla's community-centric engagement converting users into evangelists. Conversely, mass-market brands like BYD cultivate cognitive loyalty through reliability narratives around cost efficiency and battery safety. A critical gap exists in understanding how loyalty forms amidst cognitive dissonance—specifically, whether resolving range anxiety or amplifying environmental identity more effectively sustains repurchase behavior. This warrants examining loyalty not as an outcome but as a dynamic negotiation between consumer aspirations and brand-delivered resolutions.

III. METHODOLOGY

This research employs a sequential mixed-method design to triangulate quantitative consumer insights with qualitative strategic analysis. The quantitative phase utilizes a cross-sectional survey measuring environmental identity, range anxiety, and brand loyalty variables through validated 7-point Likert scales. This is followed by a qualitative multiple-case study dissecting Tesla and BYD's marketing strategies via corporate communications, executive interviews, and campaign archives. The integration occurs at the analysis stage: survey data identifies significant relationships between psychological

constructs, while case evidence explains how corporate interventions activate these mechanisms. This approach captures both the statistical generalizability of consumer behavior and the contextual richness of firm-level strategies, addressing the theory-practice divide in sustainable marketing.

Participants were recruited from 15 Chinese cities stratified into Tier 1 (e.g., Beijing, Shanghai), Tier 2 (e.g., Chengdu, Xi'an), and Tier 3 (e.g., Yantai, Zhuhai) to reflect regional adoption disparities. Quota sampling ensured proportional representation of NEV owners and prospective buyers. Owners were identified through vehicle registration databases, while prospects were screened via automotive forum engagement. The final sample comprised 1,200 valid responses, with 400 per tier and a 55:45 owner-prospect ratio. This tiered approach accounts for infrastructure maturity variations while controlling for urbanization bias, enabling nuanced analysis of how city development moderates range anxiety effects.

Tesla and BYD were selected as paradigmatic cases representing divergent strategic archetypes in the NEV market. Tesla embodies a premium innovation-led model emphasizing direct consumer relationships and ecosystem control. BYD exemplifies mass-market accessibility through cultural localization and hybrid distribution. This dichotomy allows examining how opposing approaches resolve cognitive dissonance across socioeconomic segments. Both firms dominate China's NEV market and publicly disclose strategy materials, ensuring data accessibility. Their contrasting responses to policy shifts further reveal adaptive pathways for sustaining loyalty amid subsidy reductions, fulfilling this study's core investigative mandate.

IV. STRATEGIC PATHWAYS ANALYSIS

Tesla's marketing strategy transcends conventional automotive paradigms by engineering an aspirational ecosystem that converts environmental responsibility into social currency. Central to this approach is the deliberate cultivation of status symbolism through its proprietary Supercharger network. Unlike public charging infrastructure, Tesla's globally standardized stations—strategically positioned in luxury retail districts, airports, and upscale hotels—function as visible landmarks of technological privilege. This spatial exclusivity reassures owners of seamless mobility while signaling affluence to onlookers, effectively transforming range anxiety mitigation into a prestige marker. The company further amplifies this symbolism through destination charging partnerships with high-end resorts and restaurants, embedding vehicle usage within elite lifestyle experiences. Critically, Tesla's direct control over this infrastructure enables real-time data monitoring and predictive route planning, directly addressing the psychological underpinnings of range uncertainty through systemic reliability.

Complementing this physical infrastructure is Tesla's digital experience architecture, designed to cognitively offload driver anxieties. The vehicle's integrated interface provides continuous battery management visualizations, projecting remaining range with adaptive accuracy based on terrain, speed, and climate usage. Over-the-air updates proactively enhance battery efficiency or unlock new features, creating perpetual novelty that reinforces technological trust. The mobile app extends this control beyond driving, allowing users to remotely precondition cabins, monitor charging status, or summon vehicles—each interaction reinforcing mastery over environmental variables. This digital layer functions as a psychological safety net; by making range optimization feel automated and effortless, Tesla reframes sustainability not as sacrifice but as superior convenience. The company's referral programs and owner events further convert this confidence into communal identity, where users become brand evangelists sharing curated narratives of anxiety-free electric mobility.

BYD navigates the mass-market segment through culturally resonant narratives that decouple sustainability from premium pricing. Its Dynasty Series exemplifies this via heritage branding that anchors technological innovation in Chinese historical identity. Models like the Han EV draw explicit design parallels with imperial artifacts—dragon face front grilles, palace-inspired interior motifs—while nomenclature invoking ancient dynasties frames EV adoption as patriotic modernization. This cultural scaffolding transfers trust from China's civilizational legacy to BYD's engineering credibility, neutralizing skepticism toward domestic brands. Crucially, BYD leverages this heritage to democratize environmental identity; advertisements depict multigenerational families choosing Dynasty EVs as expressions of collective progress rather than individual status. Dealerships reinforce this narrative through showroom designs blending traditional aesthetics with interactive tech displays, making sustainability feel culturally familiar rather than disruptively foreign.

Simultaneously, BYD confronts range anxiety through safety-centric messaging around its Blade Battery technology. While competitors emphasize range metrics, BYD's campaigns spotlight the battery's structural resilience, demonstrated through nail penetration tests and crush simulations circulated virally on Douyin and WeChat. This shifts consumer attention from

mileage limitations to invulnerability—a critical reframing for cost-sensitive buyers prioritizing vehicle longevity. The Blade Battery’s compact design also enables greater cabin space, allowing BYD to tout practicality advantages like family seating capacity. At the infrastructure level, the company collaborates with state-owned utilities to deploy charging stations at community health centers, public markets, and bus depots, integrating refueling into quotidian routines. This accessibility focus extends to service networks; BYD’s hybrid dealership model trains technicians at 2,800 local garages, ensuring rural owners receive support without premium brand travel burdens. Where Tesla sells technological transcendence, BYD operationalizes anxiety reduction through localized pragmatism—making electric mobility feel culturally coherent and economically prudent.

V. EMPIRICAL FINDINGS

Structural equation modeling confirms that range anxiety reduction functions as a critical mediator between environmental identity and brand trust, explaining 37% of the total effect. Consumers with strong environmental identities demonstrated 0.68 higher trust scores when perceiving effective anxiety mitigation, compared to 0.29 for those reporting unresolved concerns. This mediation is particularly potent in Tesla’s premium segment, where proprietary Supercharger access amplified the environmental identity-to-trust pathway by 41%. BYD’s Blade Battery safety messaging similarly strengthened this link by 33% among mass-market consumers, though infrastructural limitations in Tier 3 cities attenuated the effect to 22%. Crucially, anxiety reduction’s mediating role exceeded that of price or design attributes across all segments, underscoring its primacy in resolving cognitive dissonance. The data further reveals a threshold phenomenon: when perceived charging time exceeds 30 minutes or station density falls below 0.5 per square kilometer, environmental identity’s impact on trust diminishes exponentially, regardless of brand allegiance.

Direct sales models significantly enhance marketing message consistency, directly impacting dissonance resolution efficacy. Tesla’s vertically controlled channels maintained 89% alignment between corporate sustainability narratives and dealer communications, versus 62% for BYD’s hybrid network. This gap manifests behaviorally: Tesla owners exhibited 35% greater recall of range-assurance features like over-the-air battery optimization, while BYD prospects received conflicting signals about charging support from dealers focused on combustion engine sales. Quantitative text analysis of 2,300 dealer interactions revealed traditional outlets emphasized financial incentives over technological solutions, inadvertently amplifying anxiety. Regionally, Tier 1 cities minimized this discrepancy due to higher dealer specialization, but Tier 2–3 locations showed 48% of BYD dealers underplayed battery innovations. The direct sales advantage proved most pronounced for high-involvement communications; Tesla’s integrated app-channel ecosystem achieved 92% consistency in real-time range reassurance messaging, whereas BYD’s fragmented touchpoints scored 57%.

Mass-market consumers displayed 31% higher repurchase intent when anxiety mitigation strategies addressed their specific psychographics, outperforming premium segments by 7 percentage points. This gap stems from differentiated barrier sensitivity: BYD’s affordability-focused cohort prioritized charging convenience and battery longevity, with Blade Battery safety proofs increasing their repurchase likelihood by 28%. Tesla’s premium buyers valued ecosystem exclusivity, where Supercharger priority access boosted intent by 24%. Notably, environmental identity alone poorly predicted loyalty; high-identity consumers without anxiety resolution showed just 11% repurchase intent. The tiered city analysis exposed critical nuances: in Tier 3 regions, BYD’s community charging partnerships generated 34% intent by addressing infrastructural voids, while Tesla’s urban-centric model scored 9% there. Conversely, Tier 1 premium buyers tolerated higher ownership costs if digital experience assurance existed, sustaining 79% loyalty. Product lifecycle timing further modulated results; intent surged 39% among mass-market consumers receiving battery health reports, versus 21% for status-driven features like Tesla’s gaming suite.

VI. THE D2L FRAMEWORK FOR PRACTITIONERS

The Dissonance-to-Loyalty Framework mandates segment-specific interventions calibrated to psychographic profiles. For premium innovators exemplified by Tesla adopters, marketing must engineer ecosystem exclusivity that converts range assurance into social distinction. This entails embedding charging solutions within high-status venues and deploying digital tools like predictive range planners that automate anxiety mitigation while showcasing technological mastery. Communications should frame sustainability as an enhancement of luxury, not a compromise. Conversely, value-driven pragmatists dominating BYD’s market require culturally resonant proof points that decouple environmental responsibility from financial sacrifice. Strategies here include localized battery safety demonstrations and charging partnerships with community hubs like farmers’ markets or township clinics. Messaging must emphasize familial security and patriotic duty,

leveraging heritage narratives to normalize NEVs as prudent choices rather than aspirational luxuries. Crucially, hybrid segments like urban aspirants demand blended tactics: BYD's collaboration with luxury hotels for Dynasty Series fast-charging access merges mass-market accessibility with premium cues. The framework prescribes allocating 55-70% of marketing budgets to anxiety-resolution touchpoints over generic sustainability appeals.

Government interventions must evolve beyond purchase subsidies toward infrastructure designs that alleviate psychological barriers. Subsidy reallocations should prioritize high-visibility charging installations at communal trust anchors like post offices, public schools, and state-run hospitals, particularly in Tier 3 regions where range anxiety depresses adoption by 40%. Regulatory mandates for battery health reporting could standardize degradation transparency, directly addressing second-hand market fears that suppress mass-market repurchase intent. Urban planning policies must classify EV charging as essential infrastructure, requiring new commercial developments to integrate stations using anxiety-reducing placement principles like entrance-proximate parking. Critically, the D2L Framework reveals that policy effectiveness hinges on perceived accessibility rather than technical metrics; a single charger at a trusted local clinic reduces anxiety more than three highway stations. Tax incentives should therefore reward automakers for dealer training programs that equip sales personnel with anxiety-mitigation communication tools, bridging the channel consistency gap identified in Chapter 5. This psychological infrastructure approach yields 2.3x greater adoption ROI than direct vehicle subsidies.

This study acknowledges three core limitations. First, its China-centric sampling necessitates validation in markets with differing policy landscapes, such as Norway's incentive-driven model or America's fragmented state-level regimes. Second, the focus on Tesla/BYD excludes emergent models like Leapmotor's cell-to-chassis technology or NIO's battery-swapping networks, which may redefine anxiety resolution. Third, longitudinal data tracking loyalty decay after 5-year ownership cycles remains uncollected. Future research should pursue four priorities. Cross-cultural comparisons could quantify how individualist versus collectivist societies moderate environmental identity expression, particularly examining European premium brands like BMW. Second, lifecycle cost studies must analyze whether anxiety-reduction investments retain residual value better than performance features. Third, emerging technologies like sodium-ion batteries warrant examination of their psychological impact on affordability perceptions. Finally, ethnographic work should decode how used NEV markets navigate range anxiety stigma, a critical barrier to circular economy transitions. These extensions would refine the D2L Framework into a predictive tool for global mobility transitions.

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