

Intersemiotic Translation Across Digital Markets: Multimodal Adaptation of Chinese and US E-commerce Product Pages

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Article

Keywords: intersemiotic translation, multimodal discourse analysis, cross-border e-commerce, foreignization, cultural adaptation, corpus-based study

Posted Date: September 14th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10456052/v1>

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Additional Declarations: No competing interests reported.

Abstract

Cross-border e-commerce product pages constitute an underexplored site of intersemiotic translation, where verbal and visual resources are jointly reconfigured to negotiate cultural difference across markets. This study examines the multimodal translation strategies observed among Yiwu-based sellers when reconfiguring product pages for Chinese domestic (Taobao) and US-targeted (Alibaba.com) markets. Guided by intersemiotic translation theory, multimodal discourse analysis, and localization research, we examined linguistic, visual, and image-text dimensions through a three-dimensional annotation scheme. A corpus of 300 paired product pages (600 entries) across five product categories was annotated by trained coders with substantial inter-rater reliability (kappa ranging from .78 to .87). Chi-square analyses revealed a significant association between product category and linguistic strategy, chi-square (8, N = 300) = 103.52, $p < .001$, Cramer's V = .42, with hair accessories exhibiting the highest foreignization rate (76.4%) and daily necessities the lowest (8.0%). Scene type differed significantly across markets, chi-square(2, N = 600) = 42.75, $p < .001$, V = .27, with Chinese-style scenes dropping from 34.7% in CN listings to 13.3% in US listings while neutral scenes rose correspondingly. By contrast, cultural symbol retention and image and text relational structure showed no significant cross-market differences ($ps > .05$). These findings converge on what we term a cross-modal split configuration: linguistic foreignization co-occurs with visual decontextualization and structural stabilization, suggesting that different semiotic layers follow distinct adaptation logics. The findings extend intersemiotic translation theory by showing that different semiotic layers follow distinct translational logics in commercial digital media, while also offering practical insights for cross-border communication and localization.

Introduction

Cross-border e-commerce has developed into a rapidly expanding component of global trade. Digitally ordered exports from 43 developed and developing economies reached an estimated US \$2.5 trillion in 2021, representing approximately 13% of total global goods and services exports (UNCTAD, 2024). Despite this expansion, academic understanding of the communicative practices underlying cross-border product pages remains fragmented. A bibliometric review of 198 Web of Science indexed studies found that most research addresses isolated factors, such as consumer behavior, advertising, and supply chain management, without systematic attention to the semiotic operations through which products are presented across cultural contexts (Chen et al., 2022). The product page has also emerged as a site of intersemiotic translation, where linguistic choices, visual composition, and cultural symbolism are jointly reconfigured for different audiences. This gap carries particular significance for translation education and translator training, as the rapid expansion of cross-border e-commerce has generated a new category of multimodal translation tasks for which existing pedagogical frameworks offer limited preparation. These practices nevertheless provide valuable empirical evidence for understanding the competencies required in contemporary multimodal translation and localization environments. Understanding how non-professional translators and adapters navigate these tasks in

authentic commercial settings is a necessary precondition for designing evidence-based curricula that address the competences required in digitally mediated cross-cultural communication.

Yiwu, widely recognized as one of the world's largest small-commodity trading hubs, offers a natural laboratory for studying these practices. Large numbers of small and medium-sized sellers, enabled by digital platforms, now participate in international trade that was previously constrained by geographical and institutional barriers (Fan & Zhai, 2023). A typical product page illustrates the phenomenon. The Chinese domestic version of a festive lantern features a red-themed traditional scene under the title “春灯闹元宵” (Spring Festival Lantern); its US-targeted counterpart presents the same lantern against a white background as “Festival Lantern Decoration.” Such differences extend well beyond lexical translation to encompass visual framing, scene configuration, and the deployment of cultural symbols. What principles govern this multimodal adaptation?

This study addresses that question by analyzing 300 paired product pages sourced from Alibaba.com (US-targeted) and Taobao (Chinese domestic market). We draw on three bodies of scholarship, namely intersemiotic translation theory, multimodal discourse analysis, and e-commerce localization research, and develop a three-dimensional annotation scheme to capture (a) linguistic strategies, (b) visual dimensions, and (c) image and text relations. The following sections review each literature, identify the gaps that motivate the study, and present the research questions.

Intersemiotic Translation and the Foreignization and Domestication Continuum

Jakobson (1959) first distinguished intersemiotic translation, the reinterpretation of verbal signs through non-verbal sign systems, from intralingual and interlingual translation. Subsequent scholars have expanded this framework in ways that inform the present study. Gottlieb (2007) extended the notion of translation to accommodate polysemiotic text types such as film and television, arguing that translation across semiotic modes involves not merely code-switching but a fundamental reconfiguration of meaning-making resources. Kourdis (2015) framed translation as a semiotic act involving transitions between verbal and nonverbal systems, drawing attention to the interpretive and transformative nature of intersemiotic transfer. Pérez-González (2014) conceptualized audiovisual translation as a fundamentally multimodal practice, emphasizing how meaning emerges through interactions among different semiotic resources. More recently, Ketola (2016) demonstrated how image and text interact in the translation of picture books, showing that intersemiotic translation is not a unidirectional transfer from language to image but a dynamic, bidirectional negotiation between semiotic modes.

Parallel to this expansion, Venuti (1995) introduced the foreignization and domestication binary, arguing that translators navigate a continuum between retaining the source culture's markers (foreignization) and adapting them to target-culture norms (domestication). Although Venuti developed this framework primarily for verbal literary translation, it has been applied across an increasingly wide range of contexts. Torop (2002) broadened the scope further by conceptualizing “total translation,” arguing that culture

itself may be understood as a process of continuous translation. Katan & Taibi (2021) built on this perspective by emphasizing the cultural mediator role of translators, proposing that effective translation requires not just linguistic competence but deep cultural understanding of both source and target contexts. This view lends theoretical weight to treating e-commerce adaptation as a form of cultural translation, even when it is performed by non-professionals.

A common limitation of these theoretical works, however, is their near-exclusive focus on professional translators operating in literary, audiovisual, or institutional contexts. Non-professional adapters, such as e-commerce sellers in Yiwu who adapt product pages without formal training, remain almost entirely absent from the literature. These sellers operate under distinct constraints: commercial pressure, platform requirements, limited linguistic resources, and the absence of a metalinguistic environment. Their multimodal translation strategies may consequently diverge from those predicted by existing frameworks, particularly Venuti's unidimensional binary. Recent scholarship on non-professional translation has begun to address this gap in other domains such as fan subtitling and volunteer translation, but commercial e-commerce translation remains largely unexplored from an intersemiotic perspective. Research on fan translation, crowdsourced translation, and volunteer translation has demonstrated that non-professional adapters develop situated practices shaped by technological affordances, community norms, and task-specific constraints (O'Hagan, 2011). This omission has direct consequences for translator education. If existing curricula are built on models derived exclusively from professional practice in literary and audiovisual domains, they may fail to equip students with the multimodal competences needed to operate in commercial digital environments where translation is performed across semiotic modes simultaneously rather than within a single verbal channel (Kiraly, 2000). The growing presence of non-professional translation in global commerce suggests that translation pedagogy must expand its empirical base to include the strategies that untrained practitioners actually deploy, so that formal training can address the specific challenges these contexts present.

Multimodal Discourse Analysis

Multimodal discourse analysis (MDA) provides the analytical toolkit for examining how different semiotic modes collaborate to produce meaning. Halliday's (2014) systemic functional linguistics established that language operates as a social semiotic system, performing ideational, interpersonal, and textual meta functions simultaneously. Van Leeuwen (2005) extended this perspective to a broader range of semiotic resources, including images, color, typography, and everyday objects, arguing that all communicative acts draw on multiple modes whose contributions cannot be adequately understood in isolation. Building on this foundation, Kress and van Leeuwen (2006) developed an analytical framework for visual grammar, systematically revealing how visual elements such as composition, framing, and modality encode meaning in ways that parallel linguistic grammar. O'Halloran (2008) operationalized "intersemiotic mechanisms" through the systemic functional multimodal discourse analysis (SF-MDA) framework, providing tools for analyzing how meanings multiply across semiotic resources within the same text.

Of particular relevance to the present study is the work of Martinec and Salway (2005), who proposed a system for classifying image and text relations along logical-semantic dimensions. Their taxonomy distinguishes between relations of extension (where image and text provide different but compatible information) and elaboration (where one element specifies or restates the other). This classification has been productively applied to genres ranging from print advertisements to scientific diagrams, but its deployment in cross-cultural comparative designs remains rare. Bateman (2008) demonstrated how corpus methods can be systematically applied to multimodal documents, showing that recurring semiotic patterns can be identified across large collections of texts. His work provides methodological precedent for the corpus-based approach adopted here.

Despite this rich toolkit, the vast majority of MDA research examines single texts within single cultural contexts, such as a newspaper advertisement, a textbook chapter, or a museum display. Cross-cultural comparative applications are uncommon, and paired designs in which two versions of the same multimodal text are systematically compared are rarer still. In particular, Martinec and Salway's image and text relational framework has seldom been deployed to examine whether relational structures remain stable or shift when the same product addresses two different cultural audiences. This gap is directly relevant to the present study, which asks whether deep-level semiotic architecture behaves differently from surface-level adaptation.

E-Commerce Localization and Cultural Adaptation

A third literature addresses cultural adaptation in digital commerce. Hofstede's (2001) cultural dimensions framework has served as a common theoretical starting point for understanding how national cultures differ along measurable axes such as individualism, power distance, and uncertainty avoidance. Singh and Pereira (2005) applied this framework directly to website design, proposing the concept of a culturally customized website and demonstrating empirically that website content varies predictably across cultural clusters. Yunker (2003) emphasized that localization extends beyond textual translation to encompass visual design, page layout, navigation structures, and interactive elements, arguing that effective localization requires a holistic approach to user experience rather than piecemeal translation. Jimenez-Crespo (2018) introduced a translation studies perspective to website localization, defining it as a cognitive, textual, and technological process of adapting interactive web texts for different sociolinguistic contexts.

More recent work has begun to address the specific context of cross-border e-commerce. Guo et al. (2021) examined how live-streaming features shape consumers' purchase intention in cross-border e-commerce, showing that such features increase perceived value and reduce perceived uncertainty within a stimulus–organism–response framework. Chau et al. (2000) investigated how the presentation mode of product information—image-plus-text versus text-only, schematic versus paragraph—affects consumers' recall and perceived information quality in online shopping, finding that the benefit of visual information depends on consumers' prior familiarity with the product. However, these contributions share a common limitation: they approach cultural adaptation primarily from a marketing or business

perspective, focusing on commercial metrics such as consumer behavior, purchase intent, and conversion rates.

Fine-grained semiotic analysis, of the kind that would reveal how linguistic strategies, visual symbols, and image and text structures are coordinated on a single product page, remains largely absent from this literature. Chen et al. (2022) confirmed this gap in their bibliometric review, noting that the cross-border e-commerce literature lacks systematic theoretical integration across disciplines. The present study addresses this gap by positioning cross-border product pages as a form of intersemiotic translation and examining how linguistic and visual resources are coordinated across markets.

The Present Study

The convergence of these three gaps defines the research space. Intersemiotic translation theory has yet to account for non-professional adapters operating in multimodal commercial contexts. MDA tools have rarely been applied to cross-cultural comparative designs involving paired versions of the same products. E-commerce localization research has not conducted micro-level semiotic analysis of how linguistic, visual, and relational dimensions interact on product pages. The present study addresses these gaps with a corpus of 300 paired product pages and the following research questions:

RQ1: What linguistic adaptation strategies (foreignization, domestication, or NA) are employed in US-targeted product pages, and do these strategies vary significantly across product categories?

RQ2: How do scene types and cultural symbols in product images differ between Chinese domestic and US-targeted versions?

RQ3: Does the image and text relational structure remain stable across the two market versions, or does it shift alongside linguistic and visual adaptation?

Method

Research Design

This study employs a corpus-based comparative design combining quantitative frequency analysis with qualitative case examination. Following Bateman (2008), who demonstrated how corpus methods can identify recurring semiotic patterns across multimodal documents, a paired design was adopted: the US-targeted and Chinese domestic versions of the same product form a natural controlled contrast. This design holds product-level variables constant (material, function, manufacturer), ensuring that observed differences can be attributed to cross-cultural adaptation strategies rather than product characteristics. The sequential mixed-methods logic follows Gillings et al. (2024): quantitative patterns guide case selection, and qualitative analysis enriches interpretation. This approach allows us to move beyond simple frequency counts to examine how semiotic choices interact within individual product pages.

Corpus Construction

The corpus comprises 300 paired product pages (600 entries) sourced from Alibaba.com (US-targeted) and Taobao (Chinese domestic market). Sellers were classified as Yiwu-based when their platform profiles indicated Yiwu as the registered business location or store location, and identical or near-identical products are listed on both platforms. Products were sampled across five categories to capture a gradient from strong to weak cultural attributes: festive decorations (n = 90), jewelry and pendants (n = 70), hair accessories (n = 55), daily necessities and apparel (n = 50), and others (n = 35). The category distribution reflects the actual composition of Yiwu’s export commodity structure: festive decorations and jewelry together account for over half the corpus because these categories dominate the city’s cross-border trade volume. Three types of content were extracted from each listing: product titles, key descriptions (where available), and primary product images. Data were collected between January and March 2026. Product identification followed a systematic screening procedure. Candidate listings were first retrieved through platform-based searches using category-specific Chinese keywords. Products were then screened according to three criteria: (1) seller identity consistency across platforms, (2) product specification similarity, and (3) visual similarity between product images. Product pairs were retained only when the same underlying product could be reliably identified across the two market versions.

Several inclusion criteria governed selection. First, products had to be available on both platforms from the same or clearly identifiable seller, verified through store names, product specifications, and image matching. Second, physical product specifications had to be identical or highly similar, ensuring that differences between the two versions could be attributed to adaptation choices rather than product variation. Third, both listings had to include at least one product image. Products were excluded if either listing was inactive, incomplete, or if seller identity could not be confirmed across platforms. A total of 347 candidate pairs were initially identified; 47 were excluded due to mismatched specifications (n = 22), missing images (n = 14), or unverifiable seller identity (n = 11), yielding the final corpus of 300 pairs.

Annotation Scheme

A three-dimensional annotation scheme was developed, drawing on Venuti (1995) for linguistic strategies, Kress and van Leeuwen (2006) for visual dimensions, and Martinec and Salway (2005) for image and text relations. Table 1 summarizes the scheme.

Table 1
Three-Dimensional Annotation Scheme

Dimension	Variable	Options	Operational Definition
Linguistic	Translation of culturally loaded terms	FOR / DOM / NA	FOR: retains source-culture markers (e.g., Chinese Lantern). DOM: replaces with target-culture generic (e.g., Lantern). NA: no culturally loaded term present.
Visual: Scene	Scene type	Chinese-style / Western-style / Neutral	Chinese-style: identifiable Chinese environments. Western-style: identifiable Western environments. Neutral: solid backgrounds, gradients, or product-only display.
Visual: Symbol	Cultural symbol presence	Present / Absent	Present: at least one directly recognizable symbol with specific cultural affiliation. Absent: none.
Image and Text	Relational structure	Extension / Elaboration	Extension: image and text provide different information. Elaboration: one element specifies or restates the other.
<i>Note.</i> FOR = foreignization; DOM = domestication; NA = not applicable. Linguistic strategy coding follows Venuti (1995). Scene typology based on Kress and van Leeuwen (2006). Image and text classification follows Martinec and Salway (2005).			

In the linguistic dimension, coders first determined whether the Chinese product name contained a culturally loaded term. Culturally loaded terms were operationally defined as words or phrases carrying specific cultural connotations beyond their denotative meaning, including references to Chinese festivals (e.g., “春节” Spring Festival), traditional aesthetics (e.g., “国潮” classical style, “国风” national trend), cultural artifacts (e.g., “中国结” Chinese knot), or geographic and ethnic markers (e.g., “苏州” Suzhou, “汉服” Hanfu). If no culturally loaded term was present, the pair was coded NA. If a culturally loaded term was present, coders examined the English version: retention of the source-culture marker (e.g., “Chinese Lantern,” “Hanfu Style”) was coded as foreignization (FOR); replacement with a generic target-culture term (e.g., “Lantern,” “Traditional Dress”) or complete omission was coded as domestication (DOM).

In the visual dimension, scene type was classified as Chinese-style (identifiable Chinese environments, including traditional furniture, Chinese festival decorations, calligraphy scrolls, or recognizably Chinese domestic or commercial settings), Western-style (identifiable Western domestic or commercial settings, including Western holiday decorations or recognizably European or American interiors), or Neutral (solid backgrounds, gradients, product-only displays, or generic settings with no identifiable cultural markers). Cultural symbol presence was binary: any directly recognizable symbol with a specific cultural affiliation (e.g., the character “福,” red couplets, a national flag, traditional patterns such as cloud motifs or dragons) counted as Present; the absence of any such symbol was coded as Absent.

For image and text relations, the complementary extension category applied when image and text provided different but compatible information, for example when a product image showed physical

appearance while the title specified material and size. The complementary elaboration category applied when one element specified or restated the other, for example when the image depicted a product feature that the title also described verbally. This binary distinction follows Martinec and Salway's (2005) broader taxonomy but collapses the finer-grained subcategories for operational reliability.

Annotation Procedure and Inter-Rater Reliability

Annotation proceeded in two phases. In the pilot phase, two trained coders independently annotated 40 product pairs (13.3% of the corpus) to calibrate coding decisions and resolve ambiguities. The pilot revealed three types of recurring difficulty: borderline cases between foreignization and domestication (e.g., "Oriental Lantern," which retains some cultural marking but avoids the specific term "Chinese"), ambiguous scene classifications (e.g., minimalist wooden backgrounds that could be read as either Chinese or neutral), and cases where image and text relations involved mixed extension and elaboration within a single listing. For the first type, a decision protocol was established: if the English term retained any source-culture marker not commonly used in target-culture product descriptions, it was coded as foreignization. For the second, coders were instructed to apply the "naive viewer" test: would a viewer unfamiliar with the product's origin identify the scene as culturally specific? For the third, coders classified the dominant relation based on the primary image and title rather than secondary images or descriptions.

Following pilot refinements, the full corpus was annotated by the first coder, and a randomly selected subset of 100 product pairs (33.3%) was independently annotated by the second coder. Inter-rater reliability was assessed using Cohen's kappa. Results indicated substantial to excellent agreement: linguistic strategy, kappa = .87; scene type, kappa = .84; cultural symbol presence, kappa = .91; image and text relation, kappa = .78. All values indicated substantial to almost perfect agreement according to the interpretation guidelines proposed by Landis and Koch (1977). The lowest agreement was observed for image and text relations, consistent with the inherent subjectivity of semantic classification in multimodal texts. Discrepancies were resolved through discussion and consensus before final analysis.

Data Analysis

Quantitative analysis proceeded in two stages. First, descriptive statistics were calculated for each annotation dimension, including frequency distributions, percentages, and cross-tabulations by product category and market version. Second, Pearson's chi-square tests of independence were conducted to examine whether categorical semiotic features differed systematically across product categories or market versions. Specifically, analyses tested associations between (a) product category and linguistic strategy, (b) market version and scene type, (c) market version and cultural symbol presence, and (d) market version and image-text relational structure. When chi-square assumptions were violated because of sparse expected frequencies, exact tests or Monte Carlo simulated p-values were applied. Effect sizes were reported using Cramer's V, interpreted according to Cohen's (1988) conventional benchmarks while considering the degrees of freedom of each contingency table. Standardized

residuals exceeding |1.96| were examined to identify cells contributing most strongly to significant associations. All analyses were conducted in R version 4.3.2 using the stats and vcd packages.

Given that the corpus consisted of matched product pairs, each product was represented across two market contexts. However, the present analyses focused on comparing the distributional patterns of semiotic features across market-specific listings rather than modeling item-level transitions between versions. Therefore, each listing was treated as the analytical unit for categorical distribution comparisons.

Qualitative analysis centered on in-depth examination of representative cases. From each product category, one to two pairs were selected based on their typicality relative to the quantitative patterns. Following Kress and van Leeuwen (2006), each case was analyzed across all three annotation dimensions to reveal how linguistic, visual, and relational choices interact within a single product page. Cases were selected to illustrate both dominant patterns (e.g., foreignization in hair accessories) and less common configurations (e.g., domestication in festive decorations) to provide a comprehensive picture of the adaptation strategies at work.

Results

Linguistic Strategies (RQ1)

Of the 300 product pairs, foreignization was the most frequent linguistic strategy (n = 147, 49.0%), followed by domestication (n = 91, 30.3%) and NA (n = 62, 20.7%). However, this overall distribution masked substantial category-level variation. Table 2 presents the distribution of linguistic strategies by product category.

Table 2
Distribution of Linguistic Strategies by Product Category

Category	FOR	%	DOM	%	NA	%	N
Festive Decoration	55	61.1	25	27.8	10	11.1	90
Jewelry/Pendants	39	55.7	23	32.9	8	11.4	70
Hair Accessories	42	76.4	10	18.2	3	5.5	55
Daily Necessities/Apparel	4	8.0	14	28.0	32	64.0	50
Others	7	20.0	19	54.3	9	25.7	35
Total	147	49.0	91	30.3	62	20.7	300
Note. FOR = foreignization; DOM = domestication; NA = not applicable.							

A chi-square test indicated a significant association between product category and linguistic strategy, $X^2(8, N = 300) = 103.52, p < .001$, Cramer's $V = .42$. This represents a medium-to-large association.

Standardized residual analysis (see Fig. 2) revealed the primary cells driving this association. Hair accessories exhibited a significant overrepresentation of foreignization ($z = 3.21$) and underrepresentation of NA ($z = -2.48$), indicating that culturally loaded terms were not only present but overwhelmingly retained in their foreignized form. Daily necessities and apparel showed the reverse pattern: a significant overrepresentation of NA ($z = 5.87$) and underrepresentation of foreignization ($z = -4.12$), reflecting the culturally neutral character of products in this category. The Others category showed a significant overrepresentation of domestication ($z = 2.87$), suggesting that sellers of miscellaneous products tend to replace culturally specific labels with generic equivalents.

Two patterns merit emphasis. First, the three product categories with the strongest cultural aesthetic attributes, namely hair accessories (76.4%), festive decorations (61.1%), and jewelry (55.7%), all showed foreignization rates above 50%, whereas the two more functionally oriented categories fell well below. This gradient suggests that the perceived cultural value of a product directly shapes linguistic strategy choice: the more culturally distinctive the product, the more likely sellers are to retain source-culture labels as markers of authenticity and differentiation. Second, the NA category concentrated heavily in daily necessities and apparel (64.0%), confirming that culturally neutral products simply do not trigger translation strategy decisions. The absence of a culturally loaded term in the source language removes the foreignization versus domestication choice entirely, leaving these products outside the scope of the linguistic adaptation continuum.

Visual Strategies (RQ2)

Scene type.

Scene type distributions differed substantially across markets. In CN listings, neutral scenes accounted for 59.0% ($n = 177$), followed by Chinese-style at 34.7% ($n = 104$) and Western-style at 6.3% ($n = 19$). In US listings, neutral scenes rose to 83.0% ($n = 249$), while Chinese-style scenes dropped to 13.3% ($n = 40$) and Western-style remained at 3.7% ($n = 11$).

A chi-square test confirmed this difference as significant, $X^2(2, N = 600) = 42.75, p < .001$, Cramer's $V = .27$, a medium effect. The shift was driven primarily by the movement from Chinese-style to neutral scenes; Western-style scenes were nearly absent in both markets. This finding rules out a simple domestication-to-target-culture reading: sellers did not replace Chinese scenes with Western ones but rather shifted to culturally unmarked backgrounds. The practical logic is intuitive: a plain white or gradient background is cheaper to produce, easier to maintain across platform requirements, and offends no cultural sensibilities.

Category-level analysis revealed that this decontextualization was most pronounced in festive decorations, where Chinese-style scenes dropped from 45.6% (CN) to 22.2% (US), and hair accessories, where they dropped from 34.5% to 18.2%. In both categories, the decline in Chinese-style scenes was

almost entirely absorbed by increases in neutral scenes rather than by the introduction of Western-style scenes. Daily necessities, already dominated by neutral scenes in the CN version (78.0%), showed minimal cross-market change, consistent with the category's low cultural loading.

Cultural symbols.

Despite the significant shift in scene type, cultural symbol retention rates showed no significant cross-market difference. Symbols were present in 64.7% of CN listings ($n = 194$) and 62.7% of US listings ($n = 188$), $X^2(1, N = 600) = 0.18, p = .671, V = .02$. This near-zero effect size indicates that cultural symbols were retained at almost identical rates regardless of target market. As Fig. 4 shows, this pattern held across all five product categories, with the largest retention rates in festive decorations (CN: 87%, US: 84%) and the smallest in daily necessities (CN: 34%, US: 36%).

The dissociation between scene type (significant) and cultural symbol retention (non-significant) is a key finding. It means that sellers stripped away the contextual setting (the Chinese-style background, the festival arrangement, the traditional interior) while leaving the cultural symbols themselves intact. A red lantern photographed in a Chinese New Year scene for the domestic market was re-photographed against a white background for the US market, but the lantern itself, complete with golden tassels and the character “福,” remained unchanged. This selective adaptation pattern, removing context while preserving content, constitutes what we later describe as visual decontextualization.

Image and Text Relations (RQ3)

Image and text relational structure remained stable across market versions. Complementary extension was the dominant pattern in both CN listings (78.7%, $n = 236$) and US listings (76.7%, $n = 230$). The chi-square test was non-significant, $X^2(1, N = 600) = 0.24, p = .624, V = .02$ (Fig. 5). The dominance of extension reflects the informational logic of the product page genre: images display physical appearance (color, shape, size), while titles and descriptions specify functional attributes (material, dimensions, usage context). This division of labor appears to be genre-driven rather than culturally driven, as it persists unchanged across the two market versions.

The stability of image and text relations is particularly notable when viewed alongside the significant changes observed at the linguistic and visual scene levels. While sellers actively adapted what was said (linguistic foreignization) and what was shown (scene decontextualization), they did not alter how saying and showing were related. This finding suggests that the logical-semantic architecture governing multimodal coherence operates at a deeper structural level than the surface-level semiotic choices within each individual mode.

Summary of Findings

Table 3
Summary of Statistical Tests

Comparison	X ²	df	N	p	V	Effect
Language x Category	103.52	8	300	< .001	.42	Large
Scene x Market	42.75	2	600	< .001	.27	Medium
Symbol x Market	0.18	1	600	.671	.02	Negligible
Image-Text x Market	0.24	1	600	.624	.02	Negligible
Note. Effect size classification follows Cohen (1977): V = .10 (small), .30 (medium), .50 (large).						

Representative Cases

To illustrate how the quantitative patterns manifest at the level of individual product pages, we present three representative cases spanning the cultural loading gradient.

Case 1

Festive lantern (foreignization with visual decontextualization).

The Chinese domestic listing for a red paper lantern featured the title “春节小灯笼” (Spring Festival Small Lantern, Classical Palace Lantern) accompanied by an image of the lantern hanging from a wooden beam in a traditional Chinese interior, with red couplets visible in the background and warm golden lighting evoking a festive atmosphere. The US-targeted version retained the cultural label in the title (“Chinese New Year Red Paper Lantern, Classical Palace Style”), constituting foreignization. However, the product image was fundamentally transformed: the same lantern appeared against a plain white background with studio lighting, removing all traces of the traditional interior. The cultural symbol (the lantern itself, including the character “福” printed on its surface) was fully retained, but its contextual anchoring was eliminated. The image and text relation remained extension in both versions: the image showed physical appearance while the title specified product type and cultural origin. This case exemplifies the cross-modal split configuration at its most explicit: linguistic foreignization, visual decontextualization, and structural stabilization co-occurring within a single product adaptation.

Case 2

Hair clip (foreignization with symbol retention).

A traditional Chinese hair clip (“汉服发夹,” Hanfu Classical Style Hair Clip) demonstrated a similar pattern with notable variation. The CN listing showed the clip worn by a model in traditional Hanfu attire, positioned against a Chinese garden background with soft-focus bamboo and a stone bridge. The US listing retained the cultural marker in the title (“Chinese Hanfu Style Vintage Hair Clip”), again constituting foreignization. The image was replaced with a product-only display on a neutral gradient background, but the clip itself, featuring a carved jade-colored flower motif with dangling pearl chains,

was identical. The intricate traditional design elements served as cultural symbols that were preserved intact. Interestingly, the US listing added a second image showing the clip in a model's hair against a neutral background, providing additional visual information not present in the CN listing. Despite this addition, the dominant image and text relation remained extension. This case illustrates that sellers may add visual information in the US version while still maintaining the overall relational structure.

Case 3

Kitchen sponge (NA with minimal adaptation).

A set of household cleaning sponges (“海绵擦,” Dishwashing Sponge Cleaning Cloth) represented the other end of the cultural loading spectrum. The CN title contained no culturally loaded term, resulting in an NA linguistic coding. The US title (“Kitchen Cleaning Sponge Set, 5 Pack”) reflected a straightforward translation without any cultural adaptation dimension. Both listings featured the product on a plain white background, with no cultural symbols or culturally specific scene elements in either version. The image and text relation was extension in both cases, with images displaying color, size, and texture while the title specified material, quantity, and usage. The near-total absence of cultural adaptation in this case confirms that the cross-modal split configuration is driven by cultural loading: when a product carries minimal cultural significance, there is little for the adaptation process to operate on.

Discussion

This study examined how Yiwu-based e-commerce sellers adapt product pages across Chinese and US markets, analyzing 300 product pairs through a three-dimensional annotation scheme. The results reveal a consistent configuration in which linguistic, visual, and relational adaptation operate at different speeds and in different directions. Below, we interpret each finding, situate it within the existing literature, and draw out theoretical and practical implications.

Linguistic Foreignization as Commercial Strategy

The dominance of foreignization (49.0% overall) is the most striking linguistic finding, particularly its concentration in culturally aesthetic product categories: hair accessories (76.4%), festive decorations (61.1%), and jewelry (55.7%). This pattern partially aligns with Venuti's (1995) foreignization principle but demands reframing. In Venuti's formulation, foreignization constitutes an act of cultural resistance, a refusal to domesticate the foreign text for the target reader's comfort. In the present corpus, foreignization functions differently in commercial digital media than in literary translation, retaining labels such as “Chinese” or “Retro Chinese” signals cultural authenticity and functions as a market differentiator. The product's “Chineseness” is not an obstacle to be overcome but a selling point to be highlighted.

The significant overrepresentation of foreignization in hair accessories ($z = 3.21$) and its significant underrepresentation in daily necessities ($z = -4.12$) suggest that the choice between foreignization and

domestication is governed less by ideological commitment than by commercial logic tied to the product's cultural positioning. When a product's appeal derives partly from its cultural origin, as is the case with traditional hair accessories or festival decorations, foreignization becomes a rational market strategy. When a product's appeal is primarily functional, as with kitchen utensils or basic apparel, cultural marking is unnecessary and potentially counterproductive.

This finding extends the foreignization and domestication framework in two ways. First, it demonstrates that the binary operates differently in commercial versus literary contexts: where Venuti's translator resists dominant norms, the e-commerce seller leverages cultural markers as selling points. This commercial instrumentalization of foreignization has not been systematically described in the translation studies literature, which has overwhelmingly focused on professional, ideologically motivated translation practices. Second, it identifies product category as a moderating variable that existing intersemiotic translation theory has yet to systematically account for. The unit of analysis may need to shift from "text" to "product category" when the framework is applied to commercial multimodal contexts, because the same seller may foreignize one product while domesticating another based on the product's cultural positioning rather than any overarching translation philosophy.

Visual Decontextualization

The visual data reveal a complementary but distinct pattern. Scene type shifted significantly across markets ($V = .27$), with Chinese-style scenes declining from 34.7% to 13.3% and neutral scenes rising correspondingly. Crucially, this shift did not produce Western-style scenes: sellers moved toward cultural neutrality rather than toward the target culture. At the same time, cultural symbol retention showed no significant cross-market variation ($V = .02$). The combination of these two findings constitutes what we term visual decontextualization: cultural symbols are retained but stripped of their original contextual anchors.

This strategy can be understood through Van Leeuwen's (2005) theorization of semiotic resources. When cultural symbols, such as a lantern or the character “囍,” are detached from their contextual settings, they function as what might be called floating signifiers: they carry a generic sense of “Chineseness” without activating the specific cultural scripts that might alienate unfamiliar buyers. The scene, in Kress and van Leeuwen's (2006) visual grammar, constitutes the representational setting that anchors participatory meaning; removing it opens the symbol to broader interpretive possibilities. A red lantern displayed against a plain white background can be read as an exotic decorative object, a festival accessory, or simply an attractive lamp, depending on the viewer's cultural frame of reference.

For e-commerce sellers, this represents a practical solution to a cross-cultural communication dilemma: how to signal cultural distinctiveness without imposing unfamiliar cultural narratives. The strategy is economical in both semiotic and financial terms. Semiotically, it preserves the product's cultural identity while reducing the interpretive burden on the target-culture buyer. Financially, neutral backgrounds are cheaper and faster to produce than culturally specific scene arrangements. Platform conventions may

also play a role: Alibaba.com's product listing guidelines encourage clean, white-background photography, which naturally favors decontextualization.

The category-level variation in decontextualization is also informative. Festive decorations showed the steepest decline in Chinese-style scenes (from 45.6% to 22.2%), consistent with the hypothesis that products most strongly associated with specific cultural practices (e.g., Chinese New Year celebrations) require the most active decontextualization when presented to non-Chinese audiences. By contrast, daily necessities, already dominated by neutral scenes in the domestic market, showed minimal cross-market change. This suggests that visual decontextualization is a targeted strategy applied selectively to products whose domestic presentation relies on culturally specific settings.

Structural Stabilization

The non-significant difference in image and text relations ($V = .02$) represents a theoretically important null finding. While linguistic labels and visual scenes adapted to the target market, the logical-semantic architecture governing how images and text relate to each other remained stable. Complementary extension dominated in both markets (CN: 78.7%, US: 76.7%), suggesting that the deep structure of multimodal product pages is more resistant to cultural adaptation than the surface-level content within each mode.

This finding aligns with Kress's observation that multimodal texts are governed by an overarching integrative code that coordinates meaning-making across modes. It also suggests, however, that this code may operate at a level of abstraction that is relatively insensitive to cultural variation, at least in the e-commerce product page genre. The criteria for determining extension and elaboration, following Martinec and Salway (2005), focus on the abstract logical relationship between image and text rather than on culturally specific content. Our data suggest that while surface-level semiotic resources serve local market adaptation, the deep-level relational architecture reflects stable genre-driven communicative conventions rather than culturally variable meaning-making practices.

One possible explanation for this stability is that it reflects the functional requirements of the product page genre itself. Regardless of cultural context, a product page must accomplish two communicative tasks: showing what the product looks like and specifying what it does. The extension relation, where image and text provide complementary rather than redundant information, is the most efficient way to accomplish both tasks simultaneously. This genre-level constraint may override any cultural preferences for different image and text configurations, producing a stable relational structure across markets.

Another possible explanation involves the production process itself. Unlike linguistic labels (which require active translation decisions) and visual scenes (which require re-photographing or re-editing), image and text relations are emergent properties of the overall page design rather than individual semiotic choices. Sellers may not consciously manage relational structure, which would explain why it remains stable even as they actively adapt other dimensions. If this interpretation is correct, it suggests

that some aspects of multimodal adaptation are products of deliberate strategy while others are residual structural properties of the genre.

Toward a Cross-Modal Split Configuration

Taken together, the three levels manifest a consistent configuration. At the linguistic level, foreignization dominates, producing cultural labelling. At the visual level, scenes are decontextualized while symbols are retained. At the image and text level, relational structure remains stable. We describe this as a cross-modal split configuration: a systematic pattern in which different semiotic layers follow distinct translational logics within the same multimodal text.

This configuration cannot be captured by Venuti's unidimensional binary, which applies a single foreignization or domestication verdict to a text as a whole. Our findings demonstrate that a product page may simultaneously foreignize at the linguistic level (retaining "Chinese" in the title) and decontextualize at the visual level (removing the Chinese scene), while maintaining a stable information architecture. This is not incoherent but rather reflects different functional demands operating on different semiotic layers. Language can mark cultural origin because labels are low-cost, easily searchable, and contribute to product differentiation. Visual scenes must be neutralized because they carry higher processing load, risk alienating unfamiliar viewers, and incur production costs. Relational structure remains stable because it is governed by genre conventions rather than cultural adaptation.

The practical implication for cross-border sellers is that adaptation need not be all-or-nothing: linguistic, visual, and structural resources can be calibrated independently according to category-specific demands. Sellers of culturally distinctive products can retain and even emphasize cultural markers in product titles (foreignization), adopt clean, culturally neutral product photography (decontextualization), and maintain the standard extension-based information architecture. Sellers of functionally oriented products face fewer adaptation demands overall, as their products carry fewer cultural markers to begin with.

We frame this as a configuration rather than a strategy to avoid overstating the degree of conscious intentionality. The sellers in this corpus are non-professional adapters who may not articulate their choices in semiotic terms; the configuration may emerge from a combination of platform conventions, intuitive commercial judgment, and trial-and-error optimization. Future research using seller interviews or think-aloud protocols could shed light on the degree of deliberateness underlying these patterns.

Theoretical Implications

The findings carry implications for three bodies of theory. For intersemiotic translation theory, the cross-modal split configuration challenges the assumption that translation strategies apply uniformly across semiotic modes within a single text. Venuti's foreignization and domestication binary, developed for verbal literary translation, needs to be expanded into a multi-dimensional framework when applied to

multimodal texts. Our data suggest that each semiotic layer may follow its own adaptation logic, governed by a combination of cultural positioning, production economics, and genre conventions.

For multimodal discourse analysis, the stability of image and text relations across culturally different market versions raises questions about the cultural sensitivity of relational categories. If extension and elaboration are culturally invariant at the genre level, as our data suggest, then Martinec and Salway's (2005) taxonomy may capture universal cognitive or communicative structures rather than culturally variable meaning-making practices. This hypothesis requires testing across a wider range of genres and cultural contexts.

For e-commerce localization research, the findings demonstrate that micro-level semiotic analysis can reveal adaptation patterns invisible to macro-level commercial metrics. The overall process is therefore better understood as intersemiotic translation rather than localization alone, because linguistic, visual, and relational resources are reconfigured simultaneously across semiotic modes. This perspective integrates translation studies and marketing approaches to cross-cultural communication in ways that neither tradition has achieved independently. For translation education, the cross-modal split configuration offers a pedagogically operationalizable framework that moves beyond the unidimensional foreignization and domestication binary. The three-dimensional annotation scheme developed in this study could be adapted as an instructional tool for training students to make independent adaptation decisions at the linguistic, visual, and structural levels when producing multimodal translations in commercial contexts.

Limitations

Several limitations warrant consideration. First, although the corpus of 300 pairs is substantially larger than most existing studies of e-commerce multimodal adaptation, it remains limited to products sourced from a single geographic hub (Yiwu) and two specific platforms (Taobao and Alibaba.com). The extent to which the observed patterns generalize to sellers in other regions or platforms (e.g., Amazon, Shopee, eBay) remains an empirical question. Second, the annotation scheme captures broad categories rather than fine-grained semiotic detail; a more granular typology of cultural symbols or scene elements might reveal additional patterns within the broad trends reported here.

Third, this study examines product pages as static artifacts and does not address the temporal dimension of adaptation, specifically how pages evolve over time in response to market feedback, platform algorithm changes, or seller experience. A longitudinal design could address this limitation. Fourth, the absence of consumer reception data means that the communicative effectiveness of the identified strategies remains untested. Whether foreignization, decontextualization, and structural stabilization produce measurable effects on purchase intention, trust, or perceived authenticity is a question for future experimental research. Fifth, the cross-modal split configuration is described at the level of aggregate corpus patterns; individual product pages may exhibit configurations that diverge from this central tendency. Case-by-case variation deserves further qualitative investigation.

Future Research

Future research could address these limitations in several directions. Expanding the corpus to include additional platforms (Amazon, eBay, Shopee) and source regions (Guangzhou, Shenzhen) would test the generalizability of the cross-modal split configuration. Longitudinal designs could track how adaptation strategies evolve as sellers gain market experience and platform algorithms change. Consumer-facing experimental studies could assess whether foreignization, decontextualization, and structural stabilization produce measurable effects on purchase intention, trust, or perceived authenticity across different consumer segments.

Qualitative interviews with sellers could illuminate the decision-making processes underlying the patterns observed in this study. Are sellers consciously choosing to foreignize product titles while neutralizing visual scenes, or does this configuration emerge from separate, uncoordinated adaptation practices? Computational approaches, including automated image feature extraction and multilingual natural language processing, could enable analysis at a much larger scale while controlling for variables that manual annotation cannot easily capture. Finally, comparative studies examining adaptation in other language pairs (e.g., Chinese to Japanese, Chinese to Arabic) would test whether the cross-modal split configuration is specific to the Sino-US context or reflects more general principles of multimodal cross-cultural adaptation.

Conclusion

This study analyzed 300 paired product pages to examine the multimodal semiotic strategies employed by non-professional adapters in cross-border e-commerce. The findings converge on a cross-modal split configuration: linguistic foreignization co-occurs with visual decontextualization and structural stabilization, with product category serving as a key moderating variable. This configuration extends intersemiotic translation theory by demonstrating that different semiotic layers within a single multimodal text can follow opposing adaptation logics, a pattern not captured by Venuti's unidimensional foreignization and domestication binary. For multimodal discourse analysis, the stability of image and text relations across culturally different market versions raises productive questions about the cultural sensitivity of relational categories. For e-commerce localization, the findings demonstrate that micro-level semiotic analysis can reveal adaptation patterns invisible to macro-level commercial metrics. Practically, the results suggest that cross-border adaptation is most effective when calibrated independently across linguistic, visual, and structural dimensions, with culturally aesthetic products favoring foreignization and functionally oriented products favoring domestication or cultural neutrality. These findings also inform translation education by providing an empirically derived framework for training multimodal translation competence in commercial digital contexts. More broadly, the findings demonstrate that commercial digital media provide a productive empirical setting for extending intersemiotic translation theory beyond literary and audiovisual texts.

Declarations

Ethical Approval

This article does not contain any studies with human participants performed by any of the authors.

Informed Consent

Informed consent was not required because this study did not involve human participants.

Conflict of Interest

The authors declare no competing interests.

Author Contribution

L.Q. conceived the study, designed the methodology, collected and coded the data, performed the statistical analyses, interpreted the findings, wrote the manuscript, prepared all figures and tables, and approved the final manuscript.

Data Availability

The anonymized coding dataset, annotation manual, and R analysis script supporting the findings of this study are provided as Supplementary Information. Due to copyright restrictions and platform policies, the original product page images and webpage screenshots cannot be publicly shared. Additional materials are available from the corresponding author upon reasonable request.

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Figures

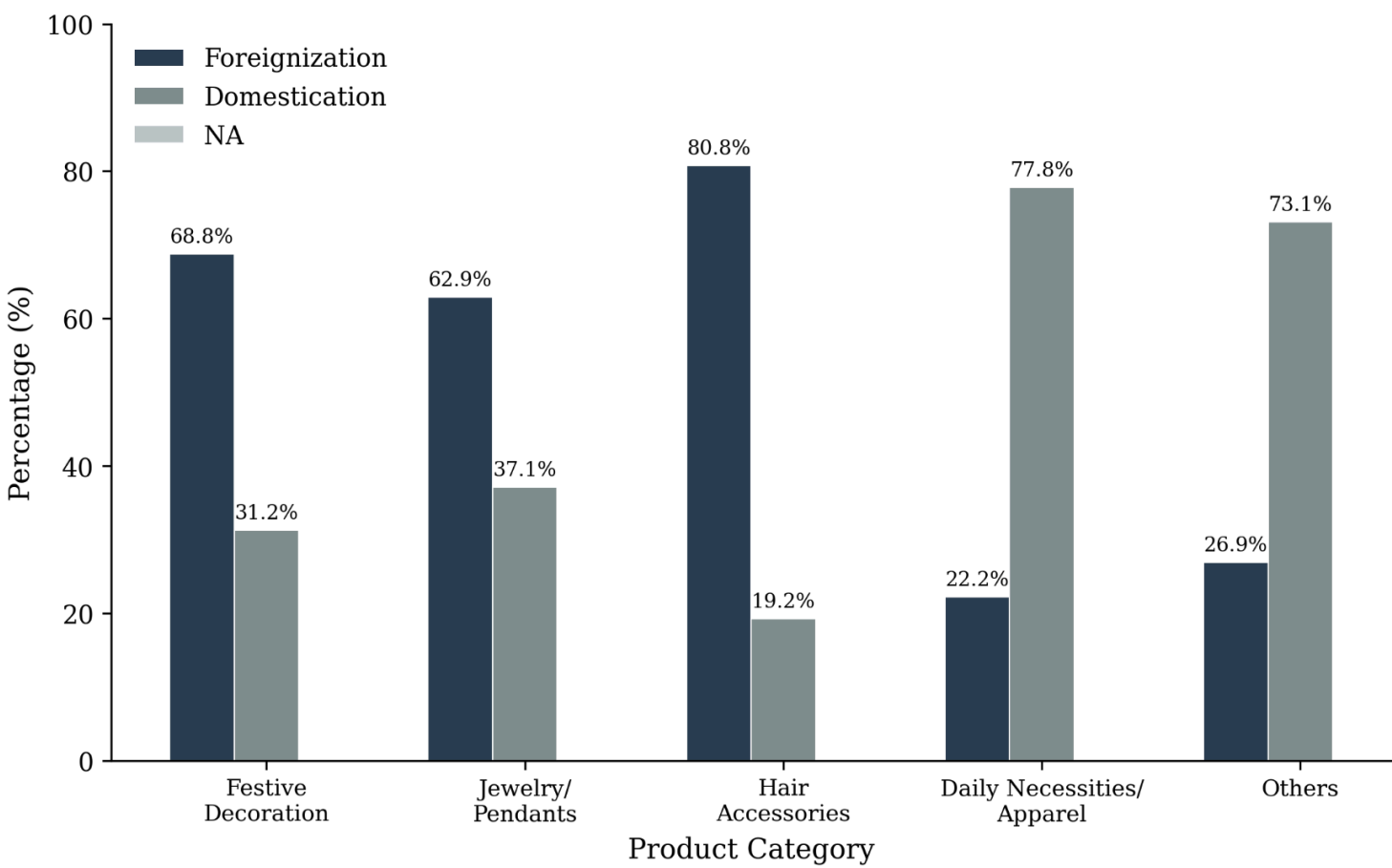


Figure 1

Distribution of Linguistic Strategies by Product Category

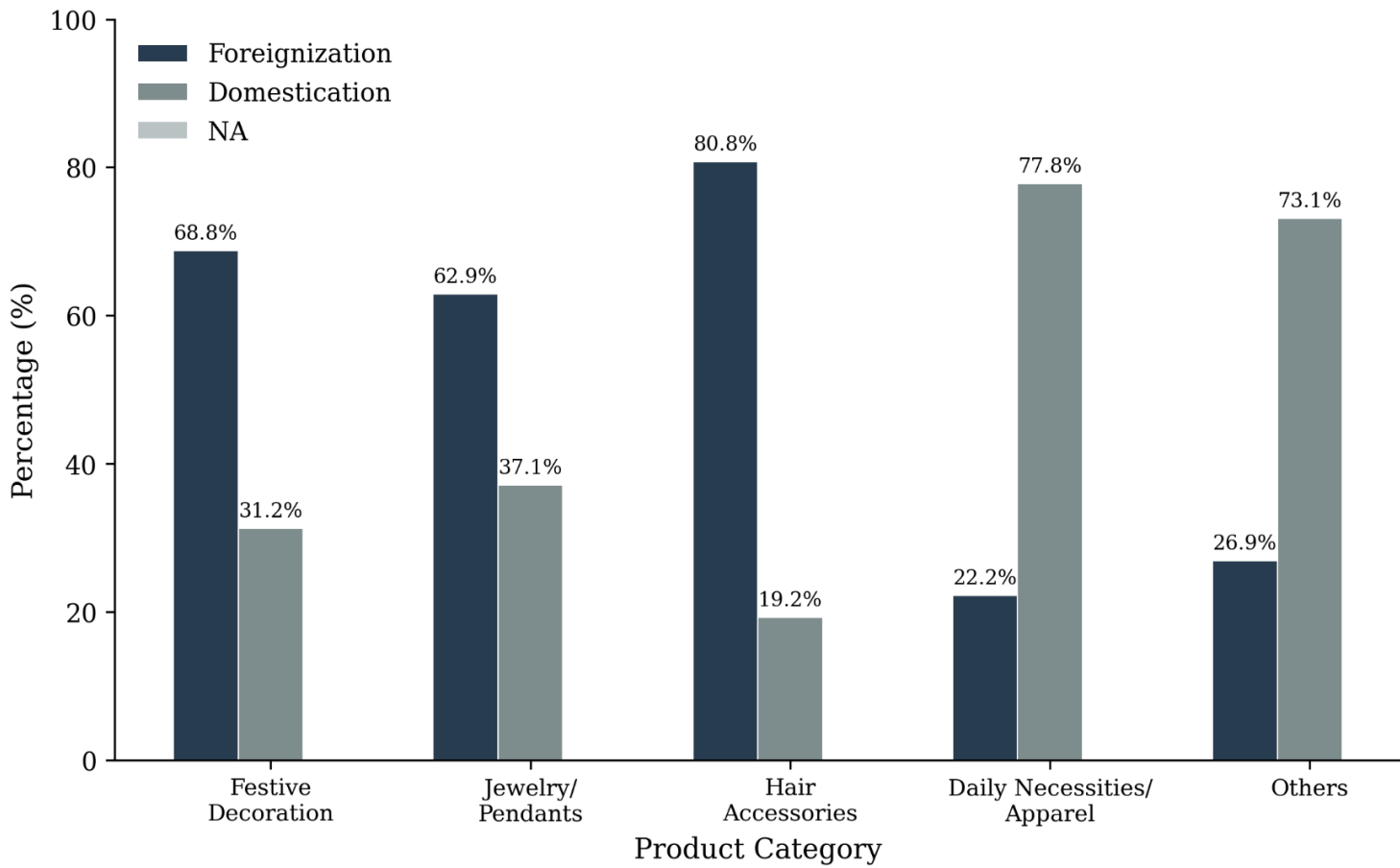


Figure 1
Distribution of Linguistic Strategies by Product Category

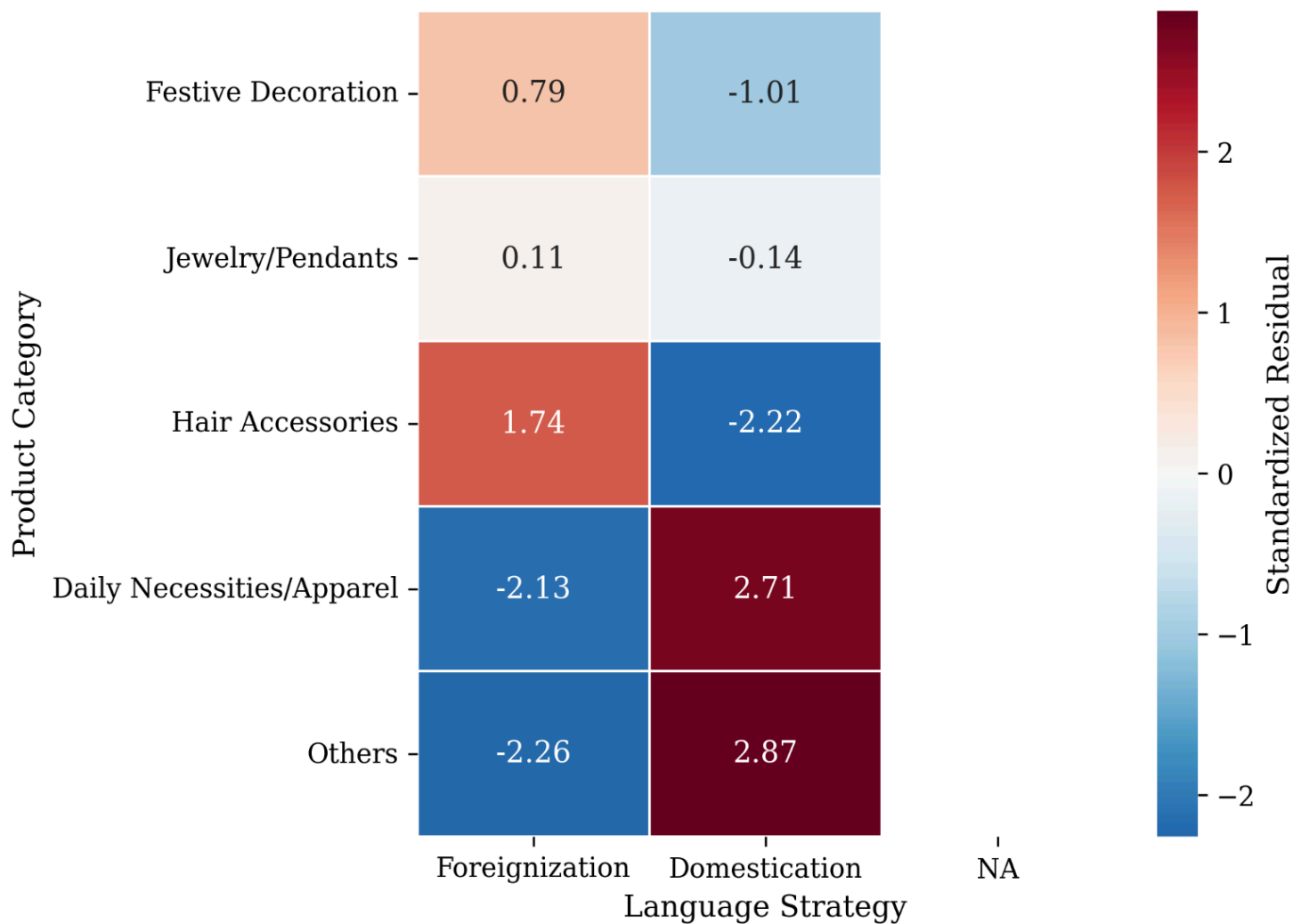


Figure 2

Standardized Residuals: Language Strategy by Product Category

Note. Residuals exceeding $|1.96|$ indicate statistically significant deviations from expected frequencies. Red cells indicate overrepresentation; blue cells indicate underrepresentation.

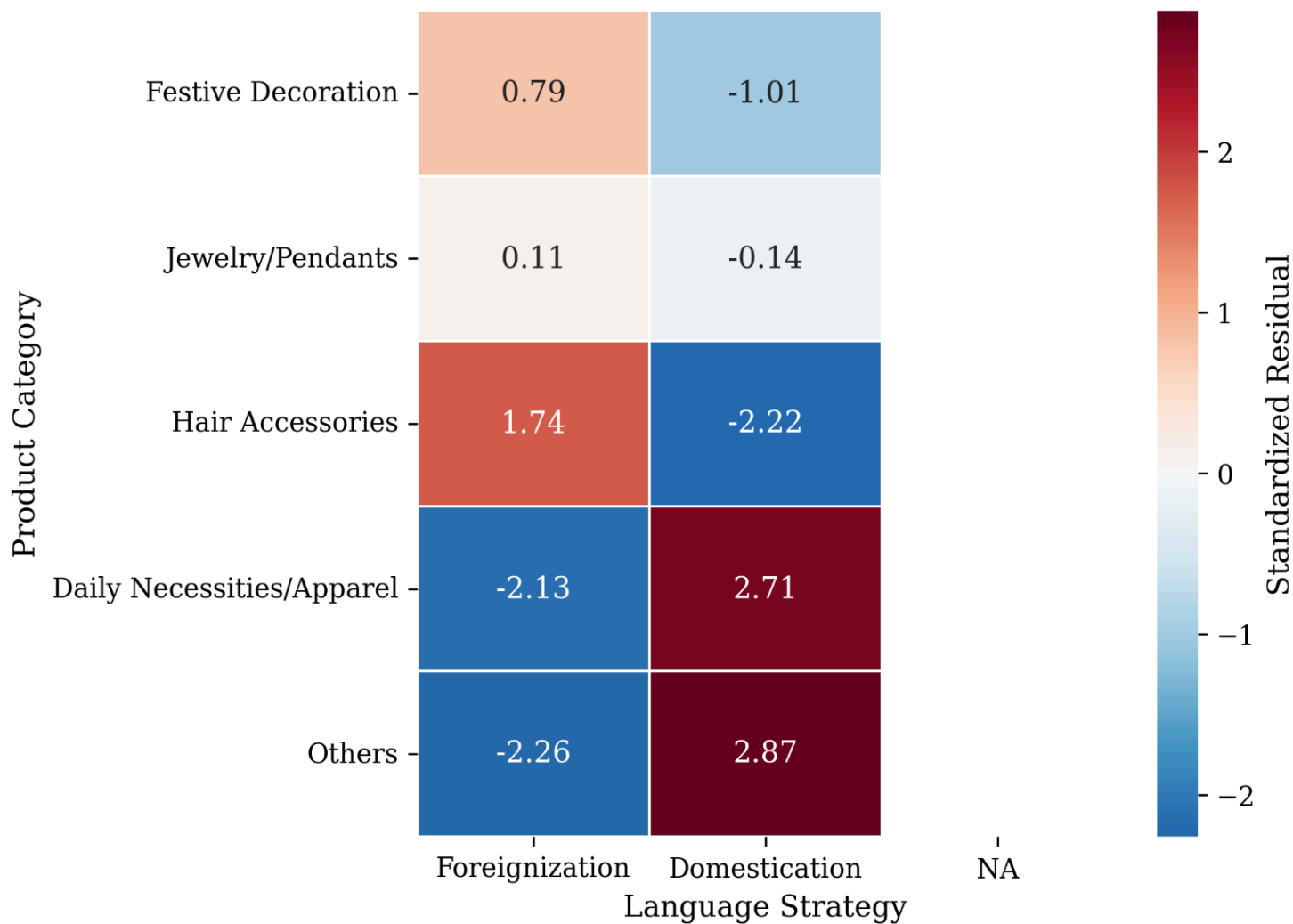


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Standardized Residuals: Language Strategy by Product Category

Note. Residuals exceeding $|1.96|$ indicate statistically significant deviations from expected frequencies. Red cells indicate overrepresentation; blue cells indicate underrepresentation.

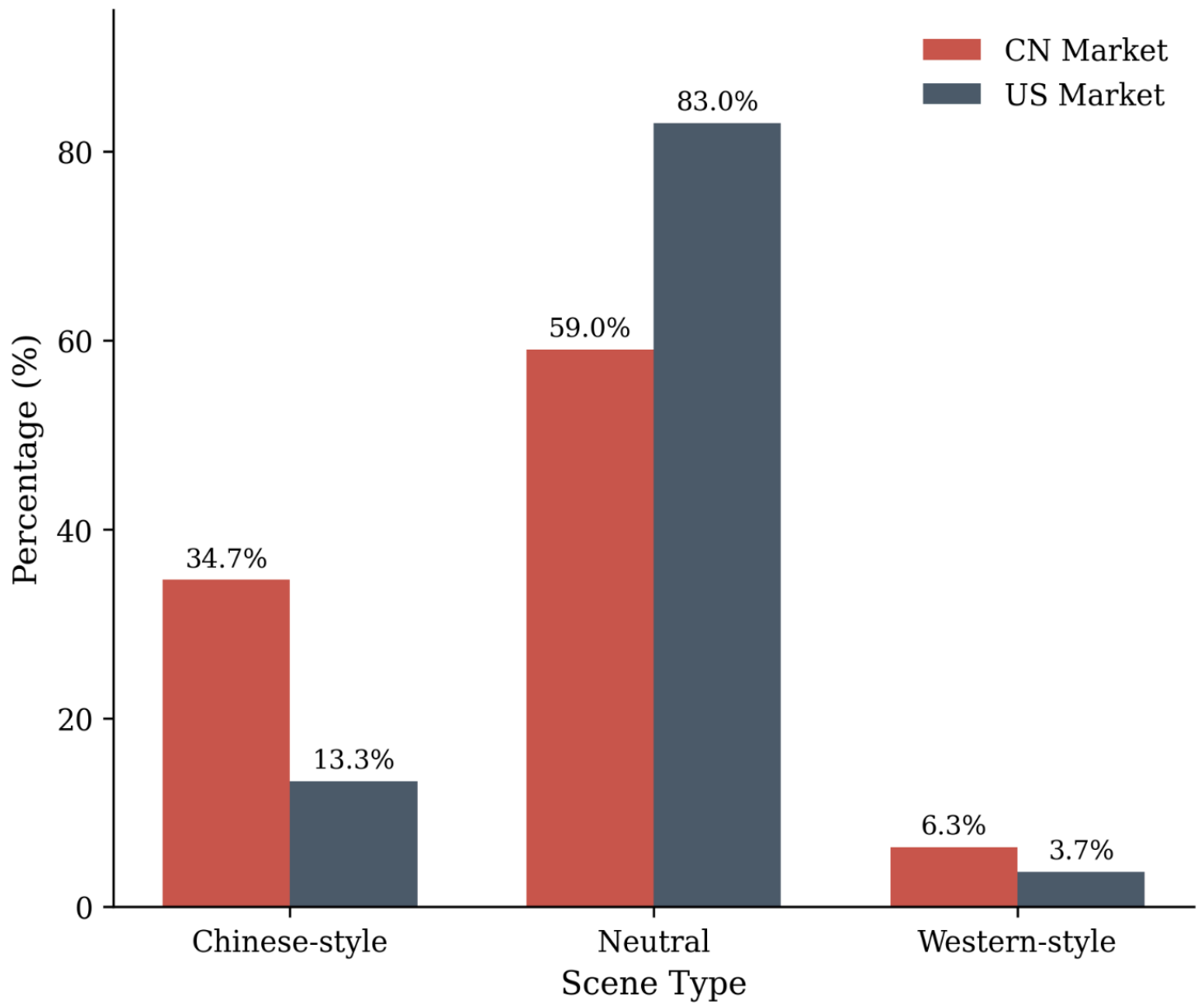


Figure 3

Scene Type Distribution by Market Version

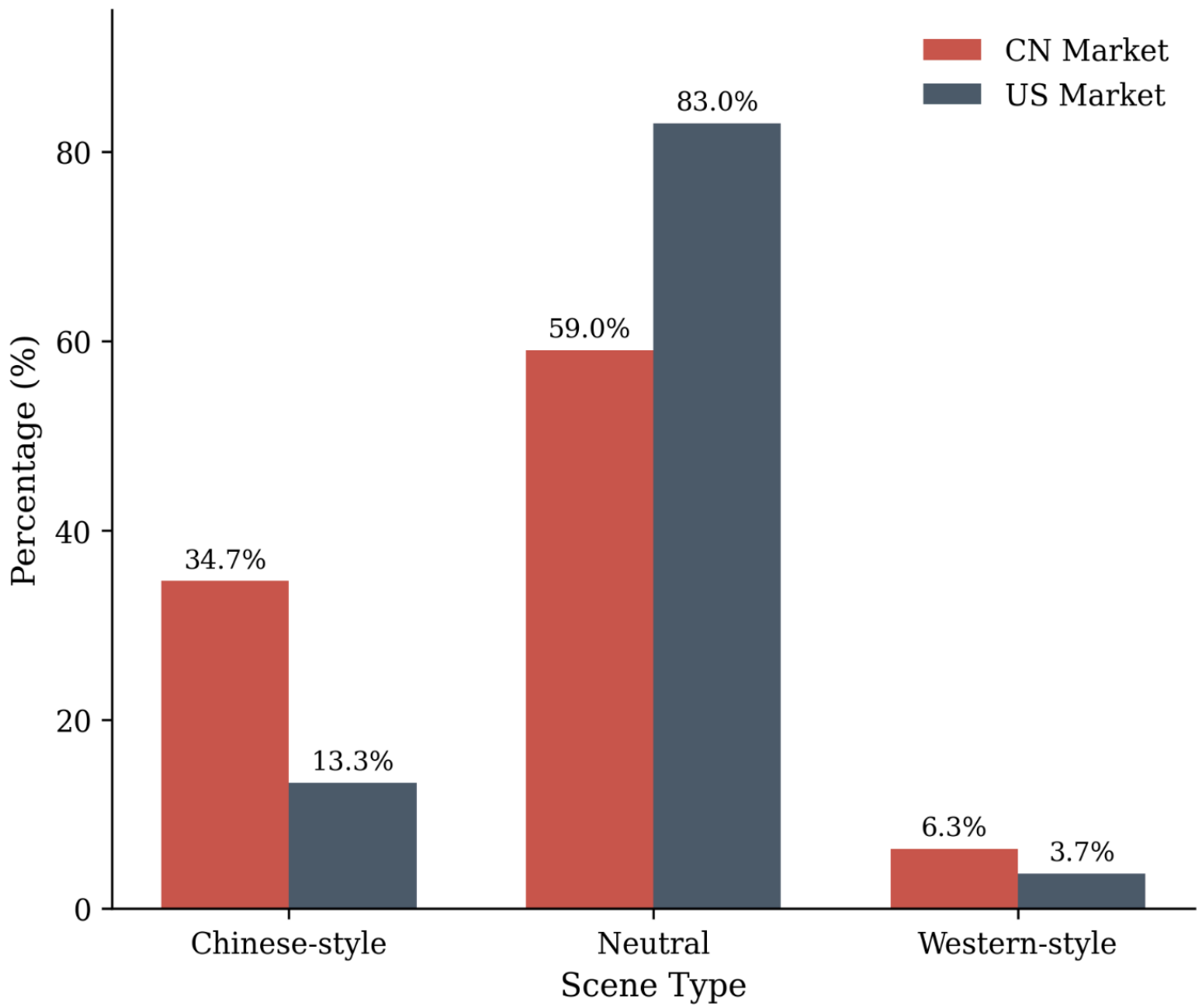


Figure 3
Scene Type Distribution by Market Version

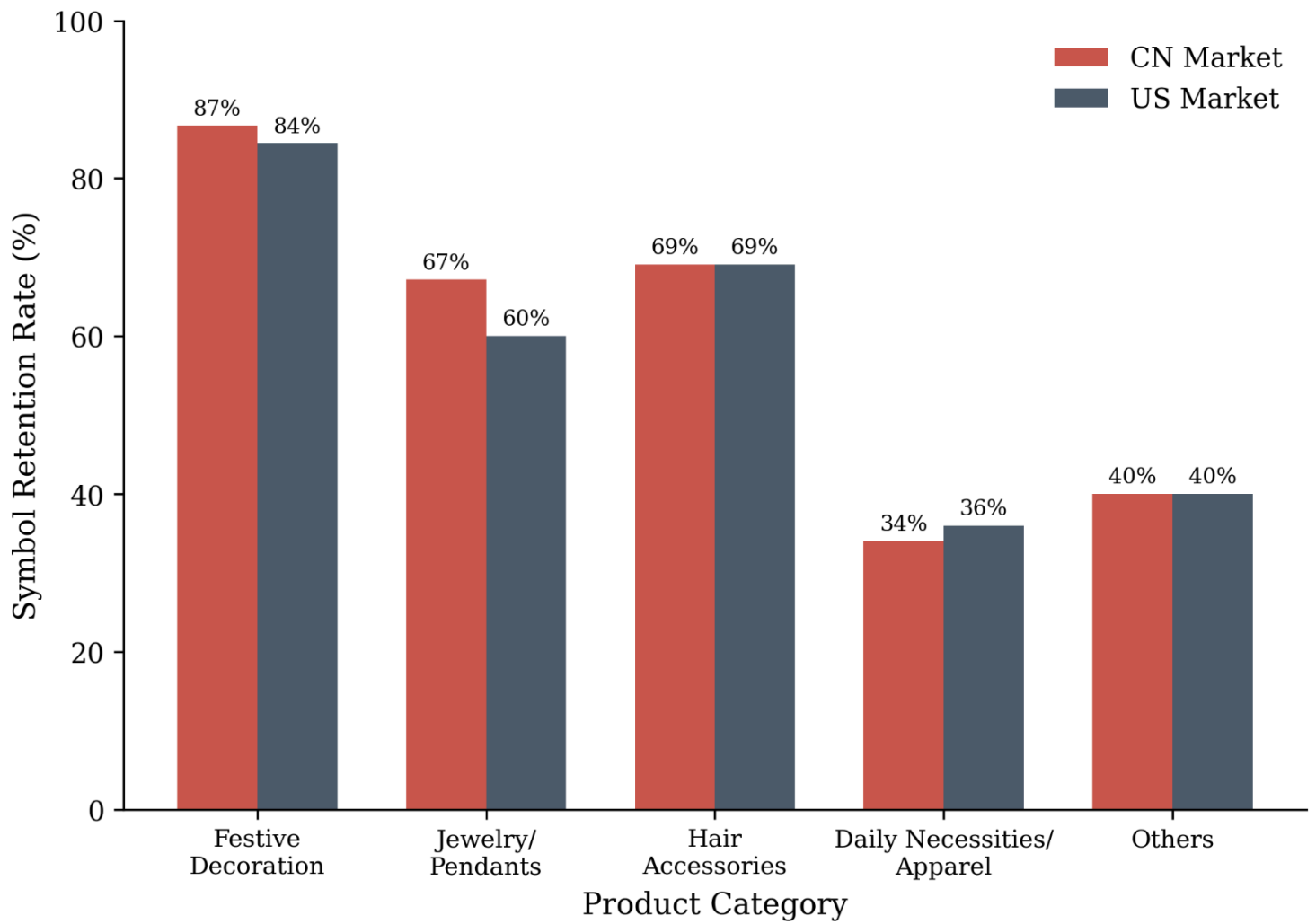


Figure 4

Cultural Symbol Retention Rate by Product Category and Market Version

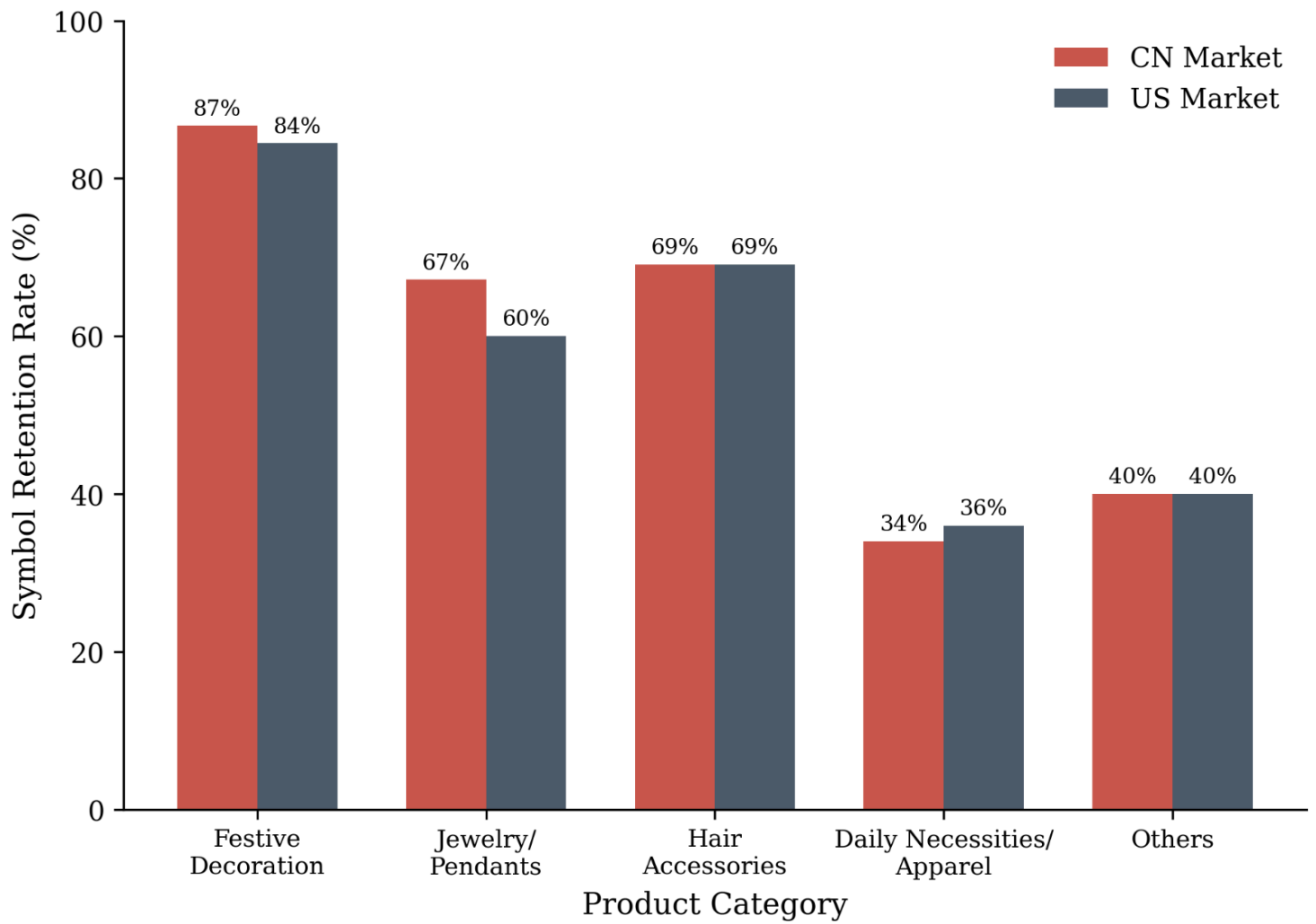


Figure 4

Cultural Symbol Retention Rate by Product Category and Market Version

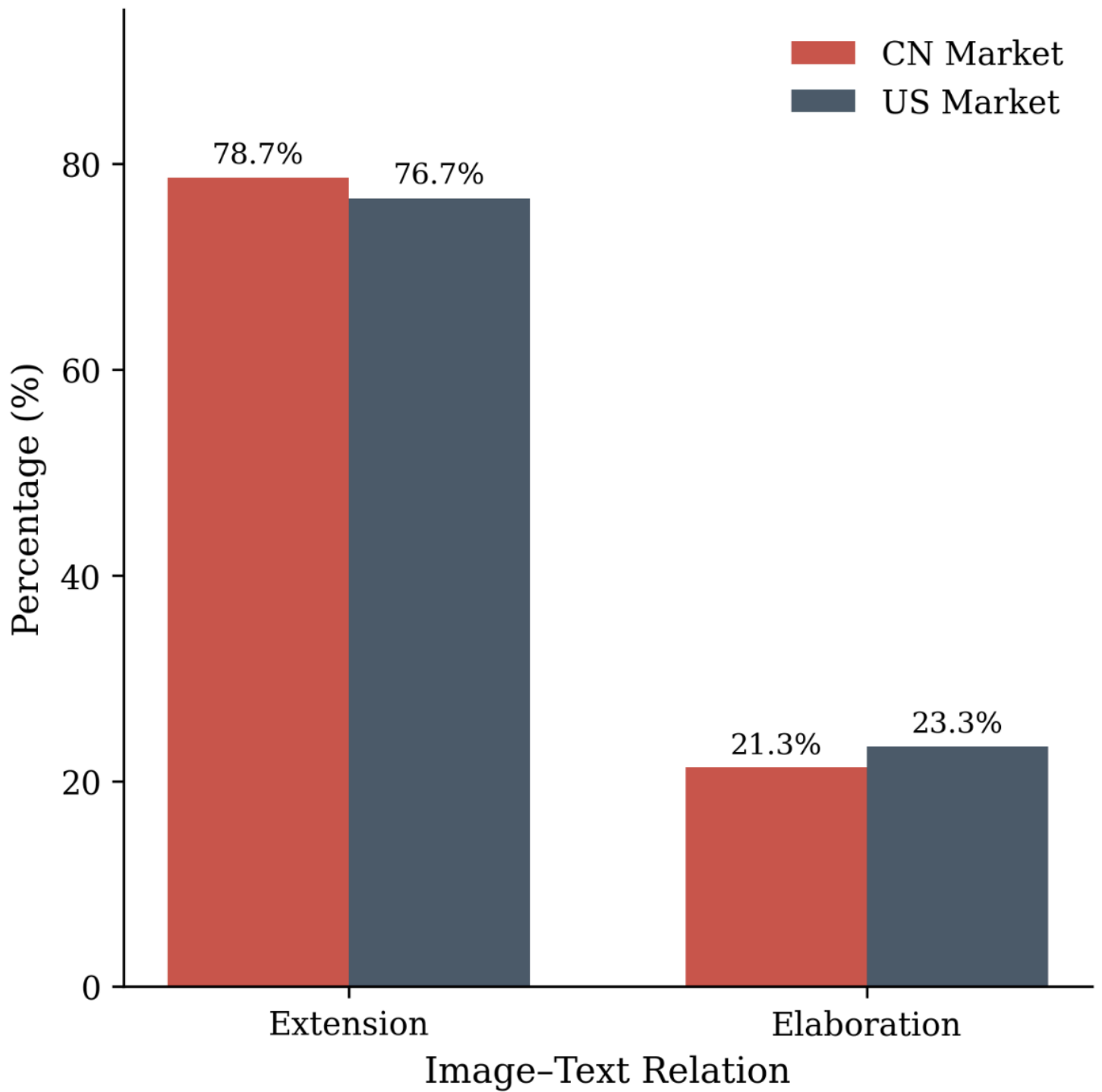


Figure 5

Image and Text Relational Structure by Market Version

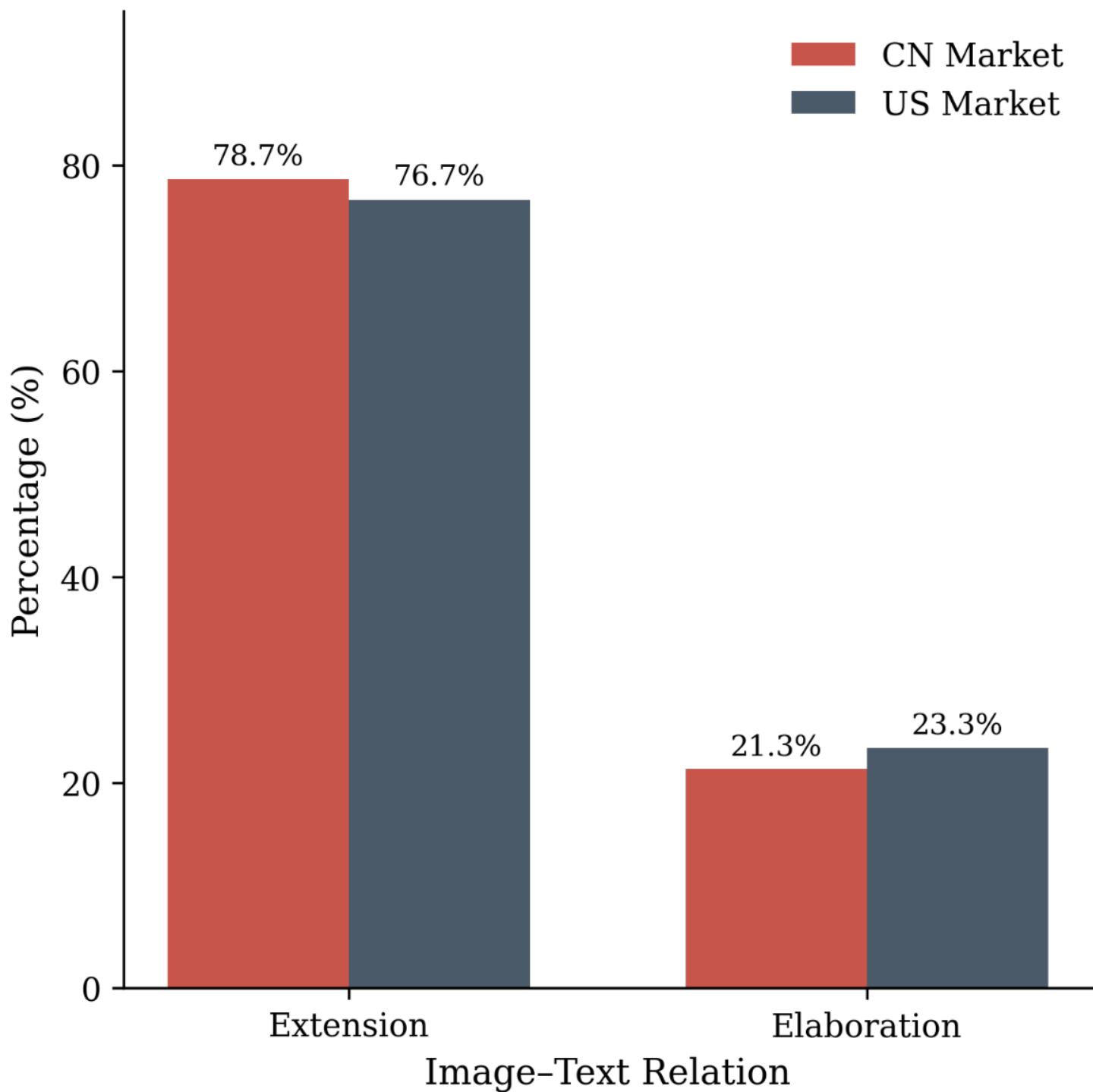


Figure 5

Image and Text Relational Structure by Market Version

Supplementary Files

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