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Review

Evaluating and Classifying Apple Brand Names: Criteria and Trends over a Century

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Abstract: Globally, fruit breeders and marketers create trademarked brand names for new varieties which can be protected indefinitely, extending returns on breeding investments. Brand names help promote and differentiate fruits, acting as quality signifiers and simplifying consumer choices. This study introduces brand name evaluation criteria, identifies name classification frameworks, and audits North American and international apple names, covering plant varietal denominations and both trademarked and non-trademarked names. Key criteria for a good brand name include trademarkability, memorability (simplicity, distinctiveness, meaningfulness, sound associations, mental imagery, and emotional impact), and marketability (appropriate brand image and marketing support). Two modified frameworks were used to classify apple names. The audit revealed that the prevalence of using 'Namesake' names associated with 'Real or Fictitious Persons/Places' has significantly decreased (North America: 4.9 times since the 1920s). The use of 'Compounding' names has remained frequent (North America: 25% in the 2020s). Some categories have seen an increased usage as follows: 'Product Unrelated—Metaphoric' (North America: 17.5 times) and 'Unusual Spellings' (not recorded until the 1980s, recently 6%) names. Since the 1960s, the following categories have remained consistent: 'Sensory', 'Product/Benefit Related', 'Product Unrelated—Non-Metaphoric', and 'Blending' names. The findings support fruit and vegetable industries in distinguishing their products through effective brand naming.

Keywords: brand naming strategies; trademarked fruit names; marketing in horticulture; naming trends; historical name analysis

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1. Introduction

Globally, fruit breeders and marketers are increasingly creating trademarked brand names for new fruit varieties. Unlike generic varietal names, the use of these trademarked brand names can be controlled and protected indefinitely. This protection helps extend the return on investment involved in the lengthy processes of breeding, testing, selecting, and commercializing a new fruit variety. Trademarked brand names not only assist in the promotion and differentiation of a commodity-like fruit but also act as signifiers of quality to consumers. This simplifies their buying process, adds symbolic value to the product [1–4], and builds valuable brand equity for the trademark rights' holder [5].

Previously, Arthur and Bejaei [6] reviewed the literature on the brand name creation process, including aspects of trademarking. However, understanding the process alone does not answer what makes a brand name good or what criteria to use when evaluating potential brand names. Complicating matters, what makes a brand name good does not automatically translate into a strong trademark name. Trademark names must also differ

from plant varietal denominations (PVDs) or generic names, as well as from any other same-fruit denominations. Other marketing aspects may impact name selection, such as the domain name availability or how acceptable a name is in a foreign language. Selecting a new fruit brand name today is particularly challenging.

"Names breathe life into things" [1] (p. 175). A good brand name is created based on a foundation of preliminary background research to understand the context into which a new name will ultimately be launched [6,7]. Such research can include information about everything from the fruit market structure, supply chain participants to consumers, to specific competing products, their marketing strategies, and consumer perceptions of the intrinsic qualities of the new and competing fruit itself, such as texture, sweetness, or tartness. Extrinsic to the fruit, consumers' thoughts and emotions about a fruit, their purchase and consumption behaviors, and the cultural contexts are also particularly important. The language used in the context of a fruit is crucial.

Morais and Lerman [8] argued that language is a strategic tool in branding. A market-based brand language audit, which includes brand names, taglines, slogans, jingles, packaging language, and all marketing materials from online to print, to video and audio, is a necessary step in the brand name creation process. Such an audit can include a comprehensive review of linguistic devices (e.g., words, terms, slogans, catchphrases, the rhythm of the words, etc.) and their intended meanings used within the relevant marketplace. This can illuminate how competitors try to distinguish their products via language and identify potential differentiating language opportunities [8]. Through such an audit, the specific language of a marketplace can be studied and formalized, highlighting issues to avoid and opportunities for effective naming.

Apples have a long history of being marketed by their varietal names, which have essentially functioned as brand names, and evidence suggests that apple names influence consumers' valuation of a new variety [9]. With the more recent implementation of trademarked brand names, apples serve as an ideal subject for a brand name audit, which is a subcomponent of a comprehensive brand language audit.

The main objectives of this study were to introduce the literature on brand name evaluation criteria and to audit apple names, including PVDs and brand names, whether trademarked or not. Specifically, the study aimed to (1) discuss the criteria for evaluating potential new apple names; (2) identify frameworks that can be used to classify fruit names; (3) audit apple PVDs and trade names by categorizing them into classifications; and (4) conduct statistical analyses on apple names to investigate the distribution of name categories, changes over time, geographical differences, and underlying structures and associations within the name category data.

Overall, this study underscores the importance of brand names in the fruit industry and the complex considerations involved in their creation. The insights gained from this research can guide breeders, marketers, and industry stakeholders in developing effective brand names that enhance consumer perception, build brand equity, and ultimately contribute to the success of new fruit varieties.

2. Materials and Methods

This study comprised the following two segments: (1) A literature review to explore the criteria for selecting fruit brand names and to develop modified name classification frameworks, aligning with the first and second research objectives, respectively. These objectives include discussing criteria for evaluating potential new apple names and identifying frameworks that can be used to classify fruit names. (2) An audit of apple brand names over the past century to evaluate changes, addressing the third and fourth research objectives. These objectives involve auditing apple PVDs and trade names by categorizing them into

classifications and conducting statistical analyses on apple names to investigate the distribution of name categories, changes over time, geographical differences, and underlying structures and associations within the name category data.

2.1. Literature Review

For this review, a systematic literature review utilizing the snowballing method was employed. The process commenced with an initial search using brand name category, brand name evaluation criteria, and fruit brand name keywords in databases such as ABI/Inform (ABI/INFORM Collection, ProQuest, Ann Arbor, MI, USA), Business Source Ultimate (Business Source Ultimate | EBSCO, Ipswich, MA, USA), Cambridge Core (Cambridge Core—Journals & Books Online | Cambridge University Press, Cambridge, UK), JSTOR (JSTOR, Ithaka Harbors, Inc., New York, NY, USA), Emerald Insight (Discover Journals, Books & Case Studies | Emerald Insight, Emerald Publishing, Leeds, UK), ProQuest (ProQuest, Ann Arbor, MI, USA), Scopus (Scopus, Elsevier, Amsterdam, Netherlands), Web of Science (Web of Science, Clarivate, London, UK), and Google Scholar (Google Scholar, Google, Mountain View, CA, USA) to identify key articles pertinent to the research topic. Abstracts and full texts of the identified articles were screened for relevance. Backward snowballing involved examining the references cited in these initial articles to uncover additional relevant studies. Subsequently, forward snowballing was used to identify later articles that cited the initial selections. This iterative process continued until a saturation point was reached where no new significant articles were identified by early 2024. This method ensured comprehensive and exhaustive coverage of the literature by leveraging the network of citations and references. Efforts were made to avoid focusing on specialized linguistic articles or citing papers that did not concentrate on brand name classification and evaluation.

2.2. Name Auditing and Name Inclusion and Exclusion Criteria

The analysis included the names of dessert (eating) apples and dual-purpose culinary/dessert apples. Excluded from the analysis were the names for apple rootstocks, crab apples, and apples primarily used for cooking, juicing, or cider production. The Fruit and Nut Cultivar Database (www.fruitandnut.org), an American register of new fruit and nut varieties introduced in 1920 and maintained on behalf of the American Pomological Society and the American Society for Horticultural Science, provided an initial list of apple PVDs and, in some cases, their trade names. Additionally, an extensive search of plant breeder rights, patents, and trademarks was conducted between June 2021 and November 2023 for apple PVDs and trade names, including those in the USA, EU, UK, AU, NZ, and CA to gather apple names from a wider geographical area and more recent years. Internet searches were also performed to help find trade names and to link PVDs to trade names, including sources such as fruit tree nurseries, apple breeders, university and government apple breeding programs, apple marketers, scientific and industry online publications, nationalfruitcollection.org.uk, pomiferous.com, and orangepippin.com. The information collected included the PVD, trade name(s), geographic origin, and date of release or introduction, or if not known, the patent or plant breeder right grant date.

In this study, PVDs are enclosed in single quotation marks and trade names are presented in all-caps with or without a trademark symbol, as appropriate.

Apple trade names, or a PVD if no trade name could be confirmed, were included in the study. Both the PVD and trade name were included if either or both are used in the marketplace (e.g., 'Cripps Pink' and PINK LADY®). Multiple trade names associated with an apple variety were also included (e.g., DIWA® and JUNAMI® for 'Milwa'). However, a trade name used for more than one apple variety was included only once in the analysis

(e.g., the PINK LADY® brand name is used for a number of varieties that are 'Cripps Pink' clones or sports).

Nonsensical code PVDs (e.g., 'B3F45') were excluded from the analysis as they are unlikely to be marketed to consumers using their PVD. Umbrella or family brand names (e.g., MELINDA®) were excluded because they are associated with various varieties and/or apple brands, often from diverse geographic origins and time periods (e.g., MELINDA® EVELINA®, and MELINDA® 'Fuji'). Names were also excluded if a release date or introduction date, or patent/breeders' right grant date, could not be found.

Names were subsequently categorized into two modified name classification frameworks, which will be discussed in the Results and Discussion section. For example, names like 'Liberty' were placed in the 'Namesake' category, reflecting the original intent behind their naming. This classification aligns with the New York State Agricultural Research Station's tradition (at the time) of naming apple varieties after locations in New York, such as the town of Liberty.

2.3. Statical Analysis

Statistical analysis of brand name auditing data was conducted using JMP 18.0.1 software (SAS Institute Inc., Cary, NC, USA). In addition to descriptive statistics and Chi-square tests, multiple correspondence analysis (MCA) was used to investigate the association between variables. MCA is a statistical method for categorical data analysis and shows the relationships, or lack thereof, between two or more categories of data while providing an excellent graphical representation of the results.

3. Results and Discussion

3.1. Literature Review to Identify Criteria for Evaluating Fruit Brand Names

Each fruit and fruit category may have specific criteria for selecting a new brand name that will help achieve brand objectives (see [6]). However, there are common, desirable characteristics that underlie the creation of new brand names and provide means to evaluate potential brand names [10–13]. Brand name selection criteria have been studied across various industries, including corporate brand names [14], aluminum household foil [15], food and beverage products [10,16], and industrial products [17].

Kohli and LaBahn [12] and Shipley et al. [16] surveyed companies to understand the criteria actually used and analyzed these name criteria in declining order of importance. For Shipley et al. [16], the criteria included the following: memorability, compatibility with the required product image, attractiveness to customers, positive connotations to potential users, trademark availability, promotability, alignment with the company image, distinctiveness from competitors, understandability, persuasiveness, ease of pronunciation, consistency with the firm's other brands, appropriate length, descriptiveness of product uses, attributes, or benefits, versatility in advertising and promotion media, attractiveness to retailers, modernity, versatility among products, and adaptability to various countries and languages. Kohli and LaBahn [12] suggested criteria including relevance to product categories, connotations, overall liking, ease of recognition, distinctiveness, and ease of recall.

Hsu and Lin [10] summarized brand name evaluation criteria into four categories as follows:

1. Linguistic Appeal: Factors such as ease of pronunciation, short length, simplicity, understandability, meaningfulness, distinctiveness, memorability (including ease of recall and recognition), and persuasive names (providing auditory satisfaction, such as pleasant repetitive sounds, verbal or sound associations, which may also include the use of morphemes or phonemes and may be modern or contemporary).

2. Emotional Appeal: The use of emotional words, with positive connotations (usually), and names that are both attractive to consumers and highly likable.
3. Marketing Appeal: The relevance to product categories, descriptiveness of product uses, attributes, or benefits, and compatibility with the required product image. It also encompasses visual relevance, evocations of mental imagery, attractiveness to retailers, ease and versatility in advertising and promotion, consistency with the company image, and the adaptability, transferability, and versatility among products and across different countries and languages.
4. Legal Appeal: Uniqueness and acceptability for trademarking or for use as a PVD.

According to Robertson [13], a brand name should be assessed based on the following two key factors: its inherent ability to be easily encoded, retained, and retrieved from memory, and the extent to which it supports or enhances the product's strategic positioning or market image. To that end, Robertson [13] suggested the following nine desirable name characteristics: simplicity, distinctiveness, meaningfulness, verbal or sound associations, evocations of mental imagery, emotional words, repetitive sounds, and the use of morphemes and phonemes. These characteristics are not mutually exclusive and can overlap.

Next, an overview of the major brand name criteria is presented, starting with the potential for a brand name to be trademarked.

3.1.1. Criteria for Trademarkable Brand Names

Trademark availability is perhaps one of the most important criteria for a new brand name. The main criteria for evaluating a potential brand name for trademarking is its uniqueness and distinctiveness within its product category (e.g., apples) and, in some cases, closely related categories (e.g., other tree fruits or fruits). Both PVDs and trademark names for apples must be searched to establish the uniqueness of a proposed trademark name. The more unique (stronger) the trademark name, the less likely it is that the trademark will cause any confusion as to the source of the product, and the more likely it is to be accepted by trademark offices.

In general, trademark offices recognize the following five distinct levels of trademark strength, from weakest to strongest: generic, descriptive, suggestive, arbitrary, and fanciful or coined (made-up) words. Generic words, such as fruit or tree or a color, or a PVD, are names used to identify the item itself, that must be freely available for all to use and may not be trademarked except in some circumstances where they may be allowed to be part of a trademark name (e.g., 'red' in RED PRINCE® apples). However, as the following sections illustrate, the criteria for trademarking are often at odds with other criteria that may make a good brand name; as the strength of a potential trademark increases, the appropriateness of it for consumers and marketing may decrease.

3.1.2. Criteria for Memorable Brand Names

A memorable name is one of the key criteria for selecting a brand name [11,16,17]. If consumers have no brand awareness at all, they will not recognize the brand name nor recall it and cannot link it to the product either. Recall is remembering a name unprompted; recognition is remembering a name when it is encountered. At the very least, a brand name should be recognizable so that consumers can correctly link the name to a product type or category (e.g., KIKU® is an apple brand). Simple, distinct, meaningful (TASTY RED™) words with verbal or sound associations and words that evoke mental imagery and emotional words (ENCHANTED®) are associated with memorable brand names [13].

Simplicity in Brand Names

Short, simple, easy-to-pronounce, easy-to-spell, easy-to-read, and easy-to-understand brand names (e.g., JAZZ®) are desirable due to their ease of recognition and recall [13]. This concept, known as fluency, impacts consumers' perceptions of product attributes; fluent brand names, compared to neutral or influent ones, positively influenced perceptions of bottled water purity and taste [18]. Ease of processing is why a new brand name created by a blending method most often blends two full words together so that the semantic meaning is easily understood with minimal cognitive effort (e.g., SWEETANGO®) [19]. Normal brand names, sharing word status with common nouns, have faster reaction times and higher accuracy due to word familiarity [20]. High-frequency words in brand names are simpler and more familiar, making them easier to recall, especially in descriptive and suggestive names. In contrast, low-frequency words or nonwords, often used in arbitrary and coined names, can be harder to recall [21]. However, Schulman and Lovelace [22] found that low-frequency words perform better in recognition tasks due to their uniqueness.

Distinctiveness in Brand Names

Distinctive names are more memorable and can strengthen trademarks, creating unique brand positioning strategies. Such names stimulate curiosity, attraction, and attention [13]. Novelty, unusualness, and unexpected contrasts grab attention [23]. Common words can be distinctive if used uniquely in their category, like 'Pilot' apples [13]. Compounded and blended words often reflect modernity and novelty [19].

Unusual spellings (e.g., CHEEKIE®, JUICI®), abbreviations (e.g., T-REX®), and acronyms (e.g., HP, IBM) enhance distinctiveness. However, unusual spellings may reduce fluency and the evaluation of product attributes if too unconventional [24]. Acronyms are less memorable than normal or other types of made-up names [25]. Well-known acronymic brands began with their full names, like Hewlett-Packard (HP) or International Business Machines (IBM).

Puns and wordplay (paronomasia) can aid memory but work best with unfamiliar brand names [26]. Wordplay may enhance positive feelings upon solving the 'riddle' in the name [27]. An example is LUDICRISP®, a play on 'ludicrous' suggesting the apple is ridiculously crispy. Metaphors and similes can also create distinctive trademarks through suggestion rather than direct description, enhancing memory [28,29].

Plosive sounds (e.g., k, t, p) make names more distinctive, enhancing recognition and recall but only when the name is less familiar [26,30,31].

Keller et al. [32] suggested that a distinct name helps reduce interference effects, where existing and new information interferes with the recall and recognition of an existing product name [33,34] (the competing theory is that brand memory might be improved by associations acting as retrieval cues). Suggestive names are particularly vulnerable to interference effects [32].

Meyers-Levy [35] examined the relationship between a brand name's association set size and word frequency on brand memory. High-frequency words elicit non-distinctive processing, while low-frequency words require more effort to understand, leading to distinctive encoding [35,36].

In recognition tasks, low-frequency words perform better than high-frequency words [22]. Coined brand names have higher recognition but lower recall compared to word brand names [37]. Arbitrary names are often better recognized because they stimulate attention and are distinctive compared to descriptive names that may be confused with similarly named products. Recognition is crucial for products on display, while recall is important for online shopping [37].

Gontijo and Zhang [20] found that recognition for coined 'nonword' brand names was slower and less accurate than for common words, but their recall was superior. Distinct names benefit from uniqueness and novelty but must be crafted carefully, as overly distinct names might be rejected by consumers [13]. Overall, familiarity with a brand name has a strong influence on memory and recall [26].

Meaningfulness in Brand Names

'Brand awareness is worth little if it is not achieved simultaneously with a meaningful concept' [38] (p. 126). The requirement is to match the name's meaning, as perceived by consumers, with the desired product image/position [13]. A meaningful name conveys relevant product information or attributes and connects the product with its category [32]. This semantic fit enhances memory, especially for unfamiliar brands [26]. Characteristics of meaningful names include typicality, familiarity, and congruence with the product category [39].

Non-meaningful words are often more easily recognized, while meaningful words have an advantage in recall [13]. Meaningful brand names assist recognition and recall through strong associative links [32]. Low-involvement brands with meaningful, descriptive names are recalled better, rated higher in quality, and are more likely to be purchased than those with non-descriptive names [21,40]; yet, repeated exposure improves the evaluations of non-meaningful names more significantly than meaningful ones [39]. Thus, non-meaningful names should be evaluated with repeated exposure rather than a single exposure [21,41,42].

However, meaningful names carry risks if market contexts change; if sweetness becomes a liability, names including 'sweet' will be disadvantaged.

Verbal or Sound Associations in Brand Names

Brand names that utilize verbal or sound associations have a recall advantage, especially if they are logical derivatives, relevant to, or consistent with the product category [13], such as using the word 'crisp' in apple brand names. This advantage stems from the categorization in the mind, making the brand name a part of the product category. Suggestive names also fall into verbal or sound associations. Additionally, this technique can connect a new apple variety to its parent(s), enhancing recognition and recall (e.g., the word, or part of the word, 'golden' or 'delicious' in apples with 'Golden Delicious' as one of the parents, or 'crisp' in apples with 'Honeycrisp' as one of the parents).

Sound associations enhance memory [13]. Onomatopoeias, consisting of syllables that suggest word meaning, create distinctive names and improve memory through deeper processing [26]. For instance, the word 'crunch' in apple brand names.

Euphony, or pleasing sound, is another factor in brand naming. A pleasant-sounding name may carry positive connotations if it aligns with the product category [13,43].

Mental Imagery in Brand Names

Images are easier to recall than words alone [44]. Image and verbal memory encoding are independent but additive in their effect on recall [45]. Mental imagery refers to a word that evokes a visual image in the consumer's mind, significantly improving recall for concrete, high-imagery words over abstract, low-imagery words [44,46].

Robertson [13] found that high-imagery brand names had significantly better recall and recognition both after one hour and two days compared to low-imagery names. High-imagery names also help in creating and implementing marketing activities. Concrete nouns evoke mental imagery better than abstract nouns [13,47]. Examples include BRAVO® for abstract and FIRECRACKER® for high-imagery names.

Mental imagery in brand names generates a larger set of cognitions, enhancing recall through stronger cognitive access [13]. It is also closely related to the emotional nature of words, like FIRST KISS® apples [48].

Emotional Impact of Brand Names

Emotions play a crucial role in creating memorable brand names that resonate with consumers. Emotionally charged words, information, and brand names enhance memory [21,49,50] and strengthen bonds between consumers and products through positive emotional associations [13]. For instance, ADORE™ may evoke stronger positive emotions than ROYALE DELBARD® [20]. Similar examples include FIRST KISS® and SMITTEN® apple brands. Emotional responses are generally automatic and require minimal cognitive processing [51].

Emotionally laden words have a processing advantage over neutral words and can be rated on scales of pleasure (valence), arousal (intensity), and dominance (control) [52]. Brand names with negative connotations, like ENVY®, attract attention but must be chosen carefully to avoid negative product evaluations [53]. High arousal, moderately negative names may be rated similarly to neutral names, and repeated exposure can lessen negative impacts [53].

Mehrabian and de Wetter [54] discovered that emotional connotations significantly influence product preferences. Selecting a name that conveys desirable emotions enhances product appeal [13,20]. Positive emotional brand names are particularly beneficial for food products, while negative valence words should be used cautiously [55].

3.1.3. Brand Image and Marketing Support

A brand name does not stand alone. A good name makes it easier to create and execute a marketing strategy. It must lend itself well to creating a brand image and market position as well as deploying a marketing campaign such as logo design, visual aspects such as colors, and the typeface/typography used for a website, social media sites, packaging and signage, advertising and promotional materials (printed and virtual), consumer promotional items, and business to business items [13]. The brand name characteristics already presented (i.e., simple, distinctive, emotional words, etc.) can all help support the creation of a brand image and marketing activities. A brand name needs to be evaluated not just for its characteristics on its own, but for its fluency and congruency with the proposed brand imagery, packaging, and marketing activities, for example [18]. Characteristics that aid the development of the desired, connotative meaning of a brand name can also enhance its brand image and marketing. If selecting a coined brand name, consumers may form some meaning based on its linguistic characteristics alone. The use of repetitive sounds, morphemes, and phonemes in brand name creation can assist with the connotative meaning of a brand name and support the brand image and marketing activities [13].

Use of Morphemes and Phonetic Devices in Brand Names

Morphemes are the smallest linguistic units with a consistent meaning, such as full words, prefixes, suffixes, and roots. They form combined meanings that support brand image, like in the brand EVERCRISP®. Names can be created by compounding (AUTUMN GLORY®), blending (SWEETANGO®), affixation (CRISPIN), and clipping (BLOSS®). Morphemes aid brand name learning as they are already represented in consumers' memory [56,57].

Non-English morphemes, although unfamiliar, can create distinctiveness, capturing attention and requiring deeper processing [58,59]. KORU® (Māori for loop or coil) is an example. However, morphemes can complicate trademarking, lose distinctiveness, or become irrelevant if associated attributes change. Blending may negatively affect recall, especially for less familiar names [26].

Phonetic devices include alliteration (CRIMSON CRISP®), assonance (SUNNY CRUNCH®), rhyme ('Picnic'), and onomatopoeia (ZINGY®). Orthographic devices include unusual spellings (KISSABEL®), abbreviations (T-REX®), and acronyms (MAIA). These devices are pleasing to hear and can enhance brand name connotations [13].

Sound repetition in brand names enhances positive evaluation, especially when spoken aloud [60]. However, this effect may not last long or may not be significant in silent contexts.

Phonemes and Sound Symbolism in Brand Names

Phonemes are individual letter sounds that evidence suggests can create sound symbolism, linking sound and meaning [61]. Sound symbolism is complex, especially in brand names. Here, we provide basic information, for comprehensive details refer to reviews by Motoki et al. [62], Spence [63], and Westbury [64].

Klink [65] emphasized that a brand name's sound can convey information and inherent meaning, affect perceptions, distinguish brands, and aid market positioning, whether supported by marketing communications or not. Sound symbolism may help set up sensory expectations and enhance multi-sensory experiences via an automatic, effortless, subconscious process [63,66–69]. Evidence shows that brand names utilizing sound or shape symbolism are learned faster and remembered longer [70,71]. This symbolism appears to transcend language and culture [72].

Sound symbolism may be particularly important for invented words. It is crucial to understand the meanings of sounds to provide a good fit with product characteristics [66] and to infer a positive rather than a negative attribute or connotation [73]. For example, higher, front vowel sounds (e, i) are perceived as lighter and more feminine, while back vowel sounds (o, u) are seen as heavier and more masculine [65]. Consonants also influence perceptions of masculinity or femininity [74], among other attributes [65,75–79]. Some phonemes have positive or negative valence [80].

Research on sound symbolism in foods and sensory attributes is growing [66,68,81]. For example, sweetness is linked with higher-pitched sounds [82]. Aligning sound symbolism with product attributes benefits brand naming and packaging [83]. However, criticisms exist, as studies often reuse the same nonwords and methods, typically involving student participants [84]. More research with real words and broader demographics is needed [85]. Some effects can be method-driven [86]. Nielsen and Rendall [77] found a consonant-vowel confound (Köhler and Emery's [87] study); participants actually used the sounds of consonants rather than vowels to match nonwords to shapes.

Further study is needed on vowels, consonants, their interaction [66,72], and the oral versus visual presentation effects [88]. Typeface and letter shape may override sound symbolism [89]. Sound symbolism's impact on product perception requires more research, especially in real-life contexts [63]. Isolating sound symbolism from other influences, like typeface, is challenging. Combining sound symbolism with other branding elements may enhance a brand's success but should not be the sole strategy.

3.2. Literature Review to Identify Brand Name Classification Frameworks

Classifying PVDs or brand names into categories is an analytical method that aids in understanding naming conventions within a specific product or service market. Analyzing the classification of brand names over time, geographic zone, or other criteria can help marketers grasp naming traditions that may already be familiar and acceptable to consumers [90]. For instance, alpha-numeric names are typical and acceptable for some automobile models (e.g., Audi's A6) but are highly unconventional and potentially less liked for apples. However, name classification can also reveal gaps, offering opportunity for new names to stand out in a competitive marketplace; a well-chosen, atypical apple brand name might resonate more with consumers than conventional names. Emerging trends in naming may create additional opportunities that consumers find increasingly acceptable.

Various brand name classification systems have been proposed over the years. For an overview, see Arora et al. [91]. Categories have been based on semantic, invented, and ex-

pressive names or combinations thereof [40,92,93]; adjectives, nouns, or verbs [94]; the generic, descriptive, suggestive, arbitrary, and coined hierarchy of names used in trademark law [95]; sound symbolism [61,65,68,91,92,96,97]; descriptive, person-based, associative, geographic, and alpha-numeric names [98]; and, linguistics other than sound symbolism [31,91]. Two product name classification methods were discussed and subsequently modified in this study to have two frameworks for analyzing the apple names collected during the auditing phase.

Rickard et al. [9] was the first to suggest a classification framework specifically used to analyze apple names, consisting of 'Namesake' (e.g., 'McIntosh'), 'Sensory' (e.g., 'Honeycrisp'), and 'Appearance' (e.g., YELLO®) categories or combinations thereof (e.g., PACIFIC BEAUTY®). These categories are intuitively easy to understand in the apple market. There has been a strong tradition of naming apples after people or places and/or their sensory qualities. However, many apple names do not fit into these categories (e.g., ENVY® and non-English words), and what we see (appearance) is one of our five senses, which is not mutually exclusive from the 'Sensory' category. To accommodate these issues, the Rickard et al. [9] framework was modified by the authors into 'Namesake', 'Sensory', 'Other' categories, and combinations of those three categories. This modified framework, referred to as Framework I in this study, offers a simple and easily understandable structure that encompasses traditional apple name types, which many in the apple industry may instinctively prefer. However, this is not comprehensive, lacking the listed categories and other methods of creating and categorizing names, such as linguistic devices.

To provide a more technical and thorough classification of apple names, names were also categorized according to Arora et al.'s [91] comprehensive framework of brand name classification. Arora et al. [91] analyzed the top 500 global brand names across eleven product categories based on their manifest content. They then classified only English language names according to a framework that incorporated all existing classifications from the literature, plus any identified gaps. This resulted in twenty possible name categories, of which the authors used twelve, plus one we added to account for non-English language apple names (Table 1).

For the purposes of this study, Arora et al.'s [91] framework was modified by the authors to exclude all sound symbolism categories and the three acronym subcategories, retaining only the overall acronym category. Sound symbolism may or may not be present in any PVD or brand name, but it is rarely the only category a name would fall into. It is a specialized area of linguistics requiring expertise beyond the scope of this study. Arora et al. [91] did not find any top brand names fitting into the sound symbolism category of 'expressive + semantic', and the 'expressive non-semantic' and 'expressive value' categories did not meet the reliability tests. The elimination of these categories is not expected to compromise the results of this study. This modified framework of thirteen categories is referred to as Framework II in this study.

Table 1. Brand name classification categories modified from Arora et al. [91], Framework II.

Major Category	First Subcategory	Second Sub-Category	Example
Word-based names			
Semantic word names	Product Unrelated—Non Metaphoric [a,b]		RAVE®
	Product Unrelated—Metaphoric [c]		'Silken'
	Product/Benefit Related [c]		'Honeycrisp'
	Real or Fictitious Person/Place [c]		LADY ALICE®

Table 1. *Cont.*

Major Category	First Subcategory	Second Sub-Category	Example
Invented word names			
Sound symbolism (all excluded from Framework II)	Corporeal/Imitative/Conventional	Expressive + Semantic [d,e]	SPRIZZLE®
		Expressive non-semantic [a,d]	
	Synesthetic	No expressive value [e]	
		Non expressive + Semantic [a]	
		Expressive value [e]	
		Expressive + Semantic [e]	
Semantic invented names	Blending [c]		SWEETANGO®
	Affixation [c]		ZESTA
	Compounding [c]		'Aurora Golden Gala'
	Clipping [c]		BLOSS®
	Unusual Spellings [c]		PAZAZZ®
Nonword names			
Acronyms	Semantically Related [a,c]		SWEET MAIA® (Midwest Apple Improvement Association)
	Semantically Unrelated [a,c]		
	Non Semantic [a,c]		
Abbreviations [c]			T-REX®
Number-based [a,f]			'Zeeapple-1'
Non-English names [g]			KORU®

Sources: Modified from [a] Arora et al. [91], including contributions from [b] McCune [93], [c] Vanden Bergh et al. [31], [d] Klink [65], [e] Dogana [92], [f] Pavia and Costa [99], and [g] the authors' own contribution, which also includes the table design and name examples. Blue text indicates categories included in Framework II.

3.3. Auditing Apple Names

3.3.1. Distribution of Name Categories in North America and Internationally

A total of 1211 apple PVDs and trade names from various sources worldwide, spanning over 100 years, were analyzed (Table 2). The results indicate that most apple names referenced in this study originate from North America, which aligns with the initial list from the American-based Fruit and Nut Registry. To ensure accuracy, the results were presented in the following two groups: North American apple names and international apple names. New apple variety introductions and registrations remained robust in North America throughout the last century; however, the highest activity in the international market occurred during the 2010s (Figure 1). This indicates stronger global competition in the current apple market.

Table 2. Geographic origin of the studied apple names.

Geographic Area	Count	Percentage
Africa	8	0.66
Asia	42	3.47
Australia/New Zealand	94	7.76
Europe	309	25.52
Middle East	10	0.83
North America	743	61.35
South America	5	0.41
Total	1211	100

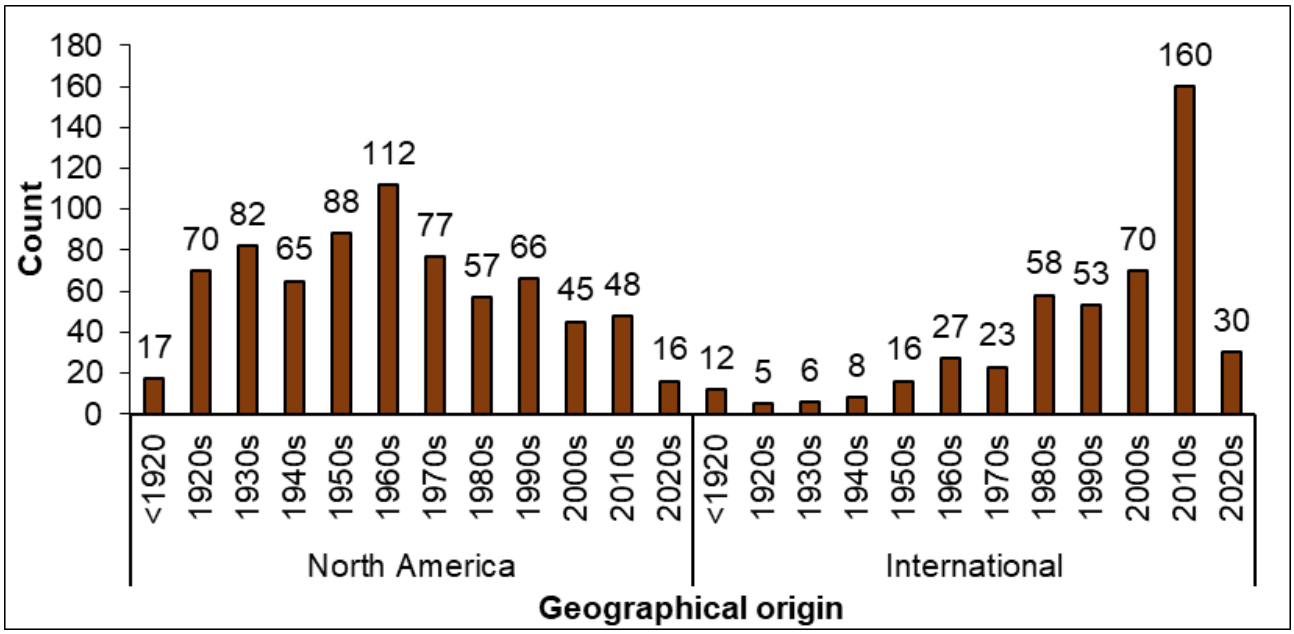


Figure 1. Distribution counts of apple release, introduction, or patent/plant breeder's right grant dates by decades in North America (n = 743) and internationally (n = 468).

Classification results based on Frameworks I and II for North American and international markets are shown in Figures 2 and 3, respectively.

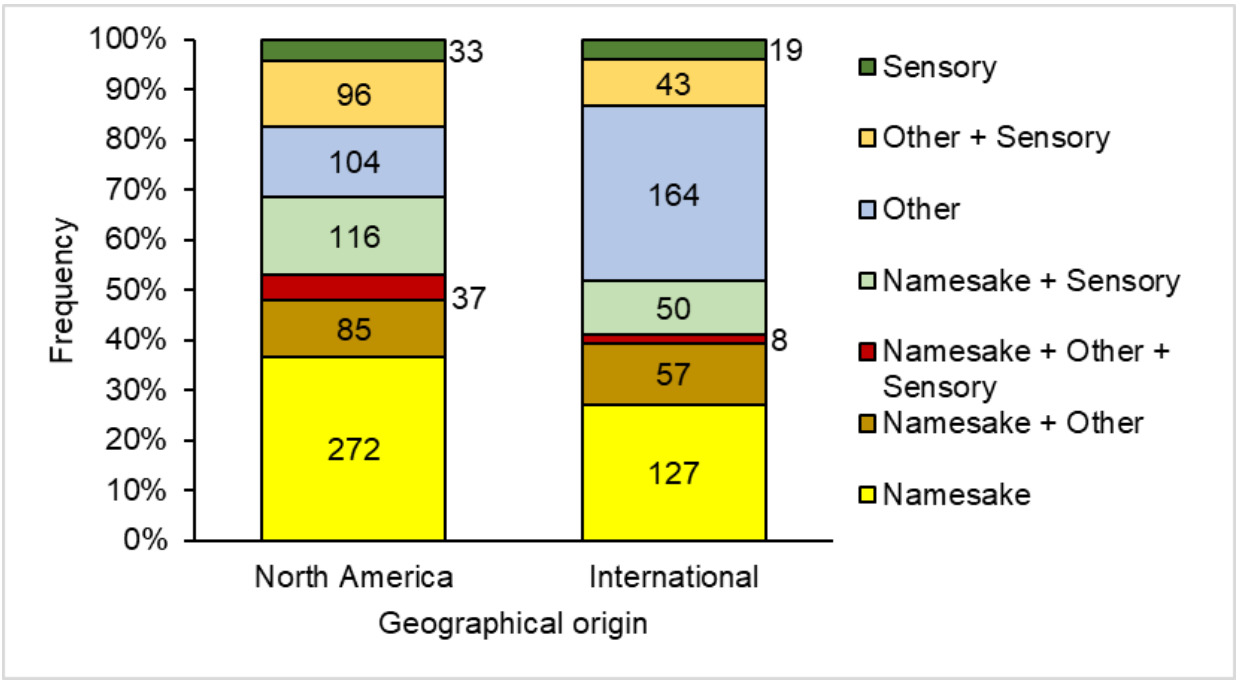


Figure 2. Framework I (modified Rickard et al. [9]). Name categories (counts) for apples bred in North America (n = 743) and internationally (n = 468). The figure shows a stacked column graph with frequencies displayed as percentages on the vertical axis and counts indicated within each section of the columns.

In Framework I, name types are dominated by the 'Namesake' category in North America and by the 'Other' category in the international market (Figure 2). In North America, the results revealed a higher-than-expected presence of the 'Namesake' category, with a lower-than-expected representation in the 'Other' category (χ^2 (6, n = 1211) = 82.35, $p < 0.0001$).

Conversely, international markets showed a lower-than-expected presence of the 'Namesake', 'Namesake + Other + Sensory', and 'Namesake + Sensory' categories, but a higher-than-expected presence in the 'Other' category.

Very few names were completely based on sensory characteristics alone, perhaps indicating that the range and availability of sensory-only names is limited. Most sensory words used to create an apple name are based on color, texture, or flavor information (usually sweet vs. tartness). Sensory words appear most frequently with another category word(s). Multi-category names reflect a method of constructing a new name but are also the result of new apple varieties that are clones or mutations of an apple variety incorporating that parent apple's name into the new apple's name (e.g., 'Duke Fuji', FUGI SUPREME).

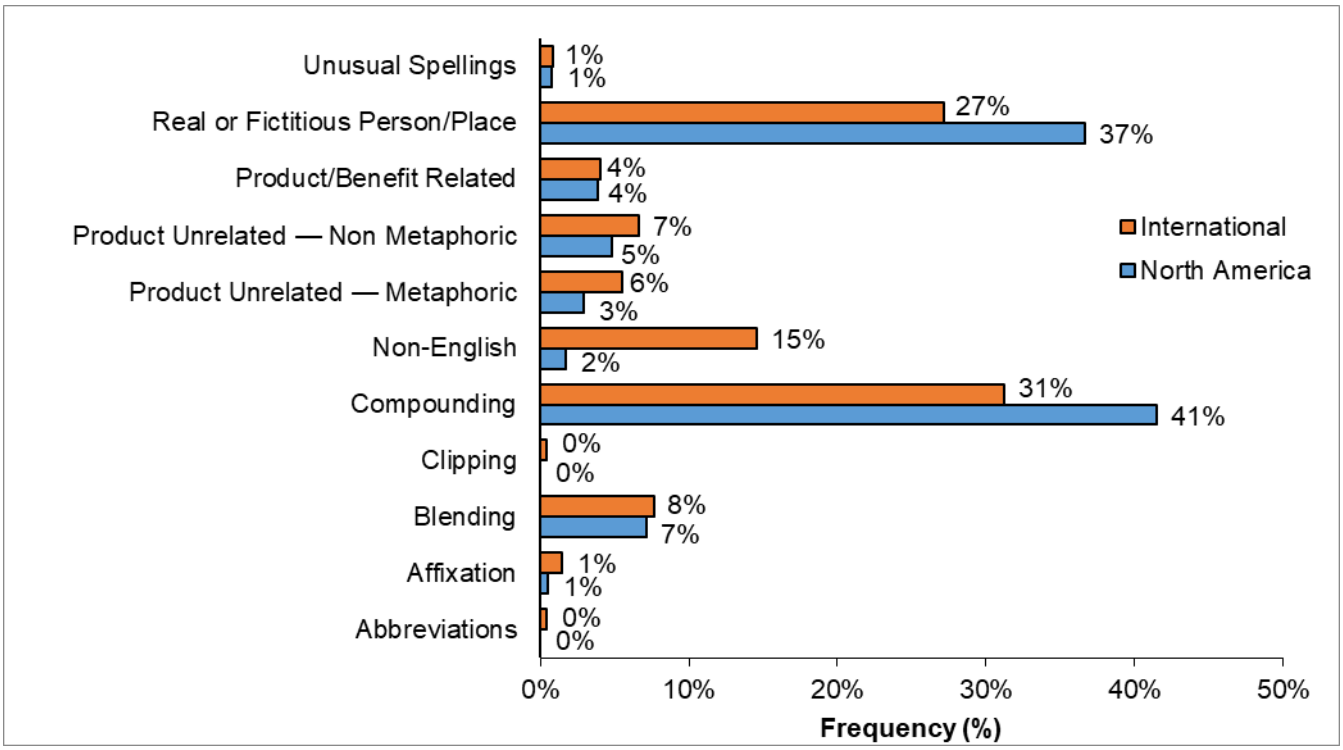


Figure 3. Framework II (modified Arora et al. [91]). Name classification counts for apples bred in North America (n = 743) and internationally (n = 468). The figure shows a stacked column graph with frequencies displayed as percentages on the vertical axis and counts indicated within each section of the columns.

Framework II results show that 'Real or Fictitious Person/Place' and 'Compounding' apple names were the top two categories in frequency in both regions, especially in North America (Figure 3). This matches Arora et al.'s [91] content analysis of the top 500 global brand names (not limited to fruits). Clearly, naming a brand after a person or place has been a popular choice.

Abbreviations for trade names are acceptable, but there are very few (e.g., T-REX® 'CIVT15' apple from Italy). An acronym is generally never chosen for a new brand name because no one would understand the underlying meaning [100]. It is only after an acronym has become a widely recognized contraction for a long, full name that it could even possibly be considered for a name. Clipping is a form of an invented word that can be acceptable for a PVD or a trademark, but the technique has not been widely used. MODI® is a clipped form of Modigliani, the Italian-bred 'CIVG198' apple. BLOSS® ('Wurtwinning') is a clipped form of the word blossom.

According to Brickell et al. [101], abbreviations for PVDs are generally not allowed, except in rare cases. In this framework, the categories of abbreviations, acronyms, and clipping categories

were merged into the 'Other' group in the next step to satisfy the assumptions required for the Chi-square test. The results indicated a higher-than-expected presence of 'Compounding' and 'Real or Fictitious Person/Place' names in North America, with a lower-than-expected representation in the 'Non-English names' category (χ^2 (9, n = 1211) = 101.91, $p < 0.0001$). In contrast, international markets showed a lower-than-expected presence of 'Compounding' and 'Real or Fictitious Person/Place' names, but a higher-than-expected presence in the 'Non-English names' and 'Product Unrelated — Metaphoric' categories. The international market is multi-lingual; non-English names may continue to be more prevalent.

In Framework II, compound names predominated in both regions. To further understand these compound names, they were then sorted into smaller categories using Framework I (Figure 4). Overall, 63.31% and 59.59% of compound names included a 'Namesake' component, 68.83% and 70.55% included an 'Other' component, and 71.75% and 59.59% included a 'Sensory' component for North American and international names, respectively.

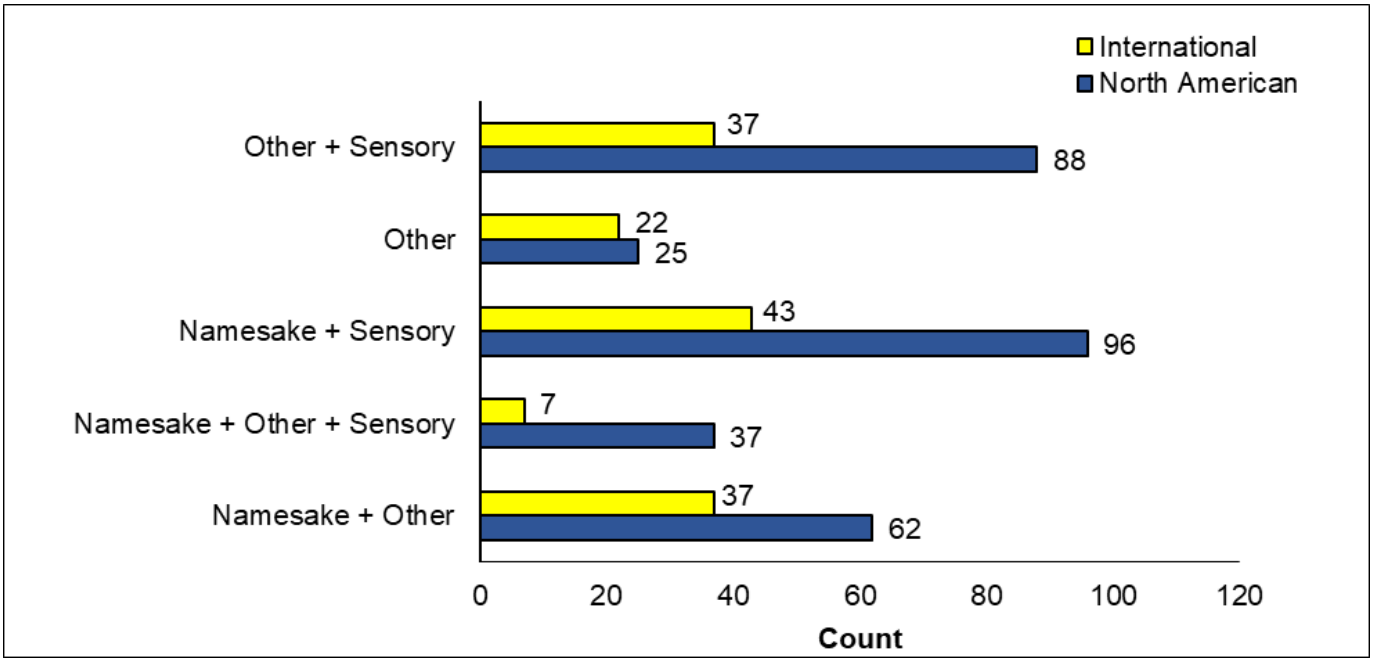


Figure 4. Breakdown of Framework II (modified Arora et al. [91]) 'Compounding' name categories in Framework I (modified Rickard et al. [9]) categories in North American (n = 308) and internationally (n = 146) bred apples.

The 'Blending' name classification from Framework II was also broken down by Framework I name categories (Figure 5). Overall, 79.25% and 75% of blended names consisted of at least one 'Namesake' component, 62.26% and 80.56% consisted of at least one 'Other' component, and 49.06% and 33.33% consisted of at least one 'Sensory' component for North American and international names, respectively. Changes in these categories over time are explored later in this section.

Both blending and compounding may include the use of one or both, if a cross, parent apple names, for example 'Jonagold' which is a blend of 'Jonathan' and 'Golden Delicious', its two parent apples. Names have sometimes included information more important for the grower, such as including the word 'early' or 'late' to indicate when an apple is ready for the harvest.

The substantial quantity (271) of 'Other' names in Framework I highlighted a significant gap in the original scheme, thereby justifying the authors' decision to include an 'Other' category. Figure 6 breaks down this 'Other' category from Framework I, using Framework II.

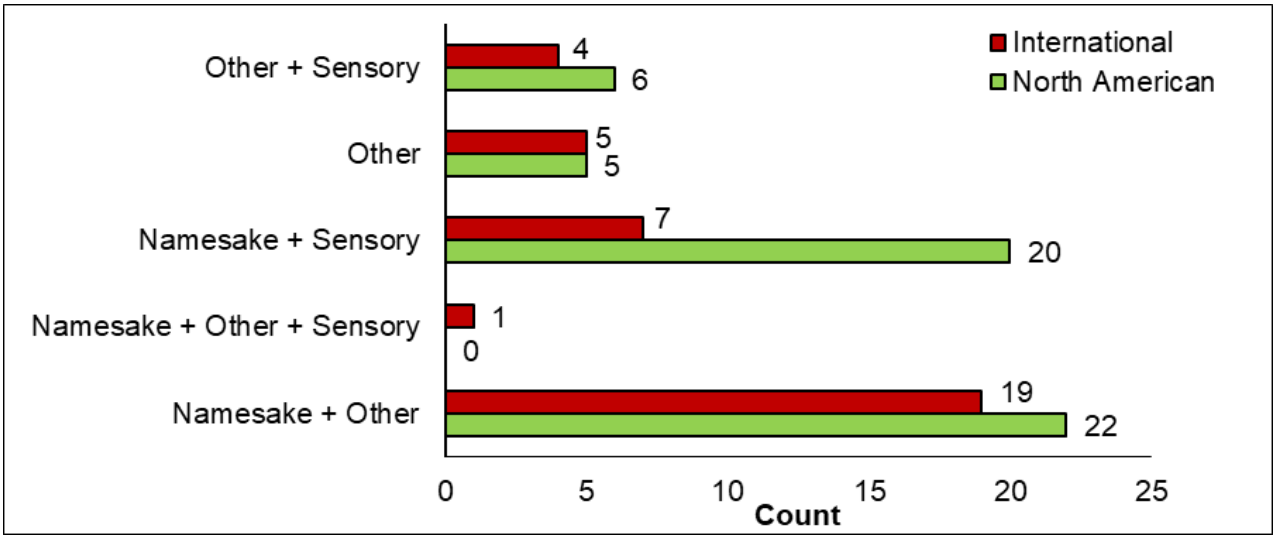


Figure 5. Breakdown of Framework II (modified Arora et al. [91]) 'Blending' name categories in Framework I (modified Rickard et al. [9]) categories in North American (n = 53) and internationally (n = 36) bred apples.

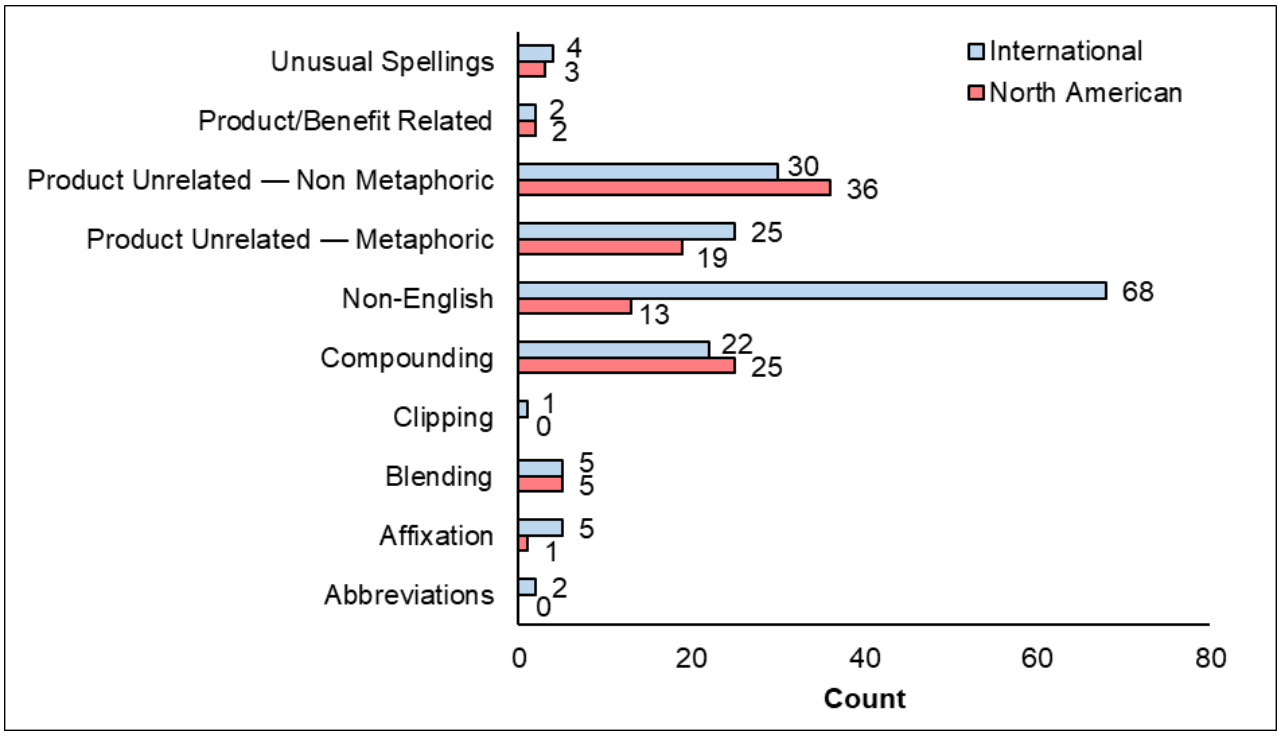


Figure 6. Breakdown of Framework I (modified Rickard et al. [9]) 'Other' category names in Framework II (modified Arora et al. [91]) categories in North American (n = 104) and internationally (n = 164) bred apples.

The trend of names can also be seen in the trends of apple sales. 'Delicious'-type apple sales have been declining in recent years and 'Honeycrisp'-type apple sales have increased [102]. From 2000 onwards, no PVDs or trade names in the names studied in this project included the word, or part of the word, 'delicious', whereas there were ten apples that included 'crisp' in their name.

3.3.2. Changes in Apple Fruit Name Categories over the Last Century

The mosaic plots in Figure 7 illustrate Framework I name classifications based on the decades of introduction in North America (a) and internationally (b). The frequency of 'Namesake' names decreased from the 1920s to the 1990s in both regions, then slightly increased in the 2000s, and has remained at a similar level since. The use of the 'Namesake + Other' category has been stable in North America. The use of the 'Other + Sensory' and 'Other' categories has increased slightly over time, while the use of 'Namesake + Sensory' has slightly decreased in North America. Names from the 'Other' category are more prevalent in apples originating internationally, perhaps due to the use of more non-English names.

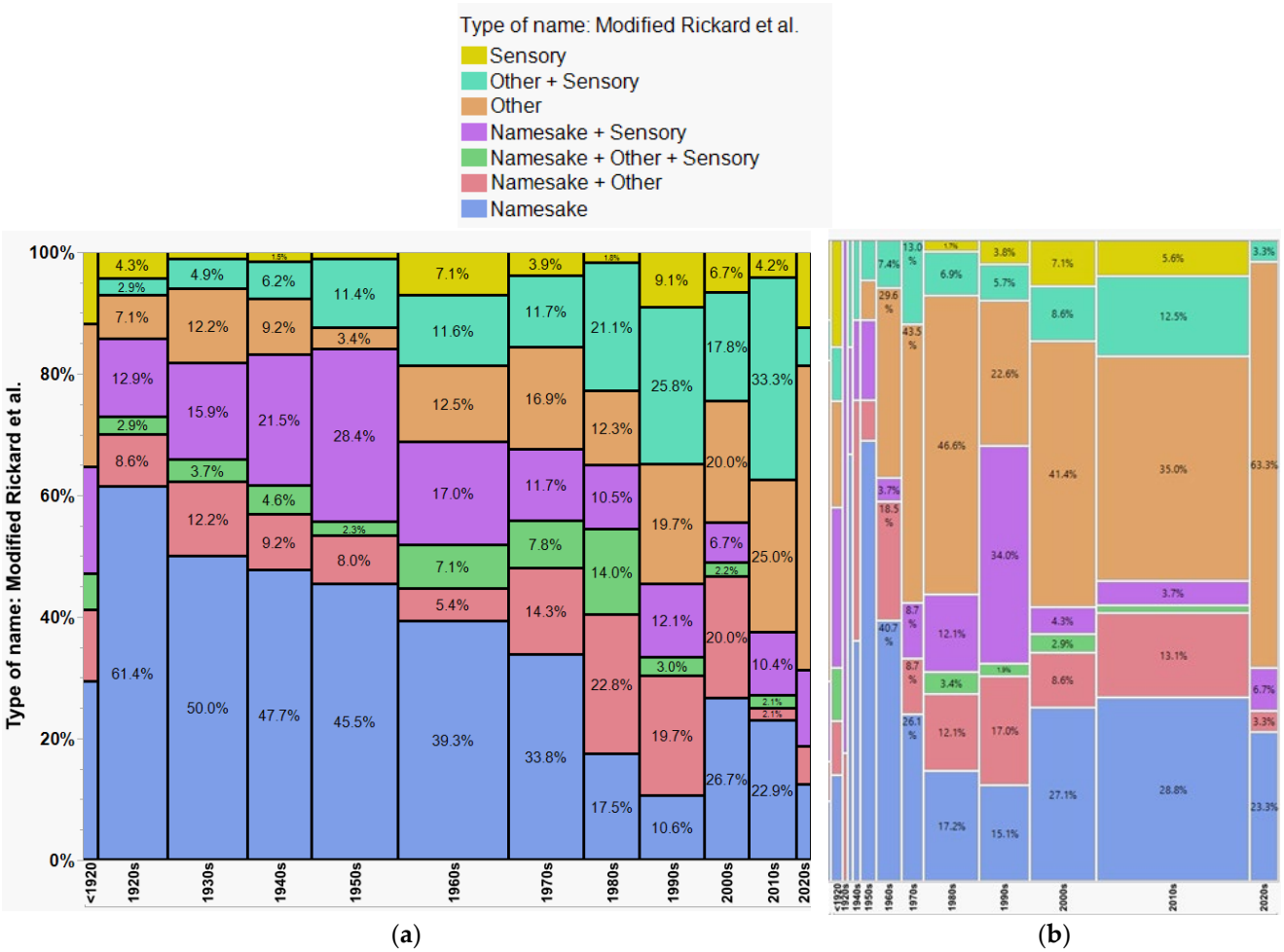


Figure 7. The mosaic plots of Framework I (modified Rickard et al., [9]) name categories by the era of introduction in (**a**) North American (n = 743) and (**b**) internationally (n = 468) bred apples. The width of each column in the mosaic plot represents the number of items in the grouped decades, while the color distribution within each column shows the relative frequency of each name category.

The mosaic plots in Figure 8 show the Framework II name classifications based on decades of introduction in North America (a) and internationally (b). Like the 'Namesake' category in Figure 7, the frequency of names using 'Real or Fictitious Person/Place' decreased until the 1990s, then slightly increased and remained stable (Figure 8). Names from the 'Compounding' category have been used more frequently over time in both regions, while the use of names from the 'Blending' category has remained stable.

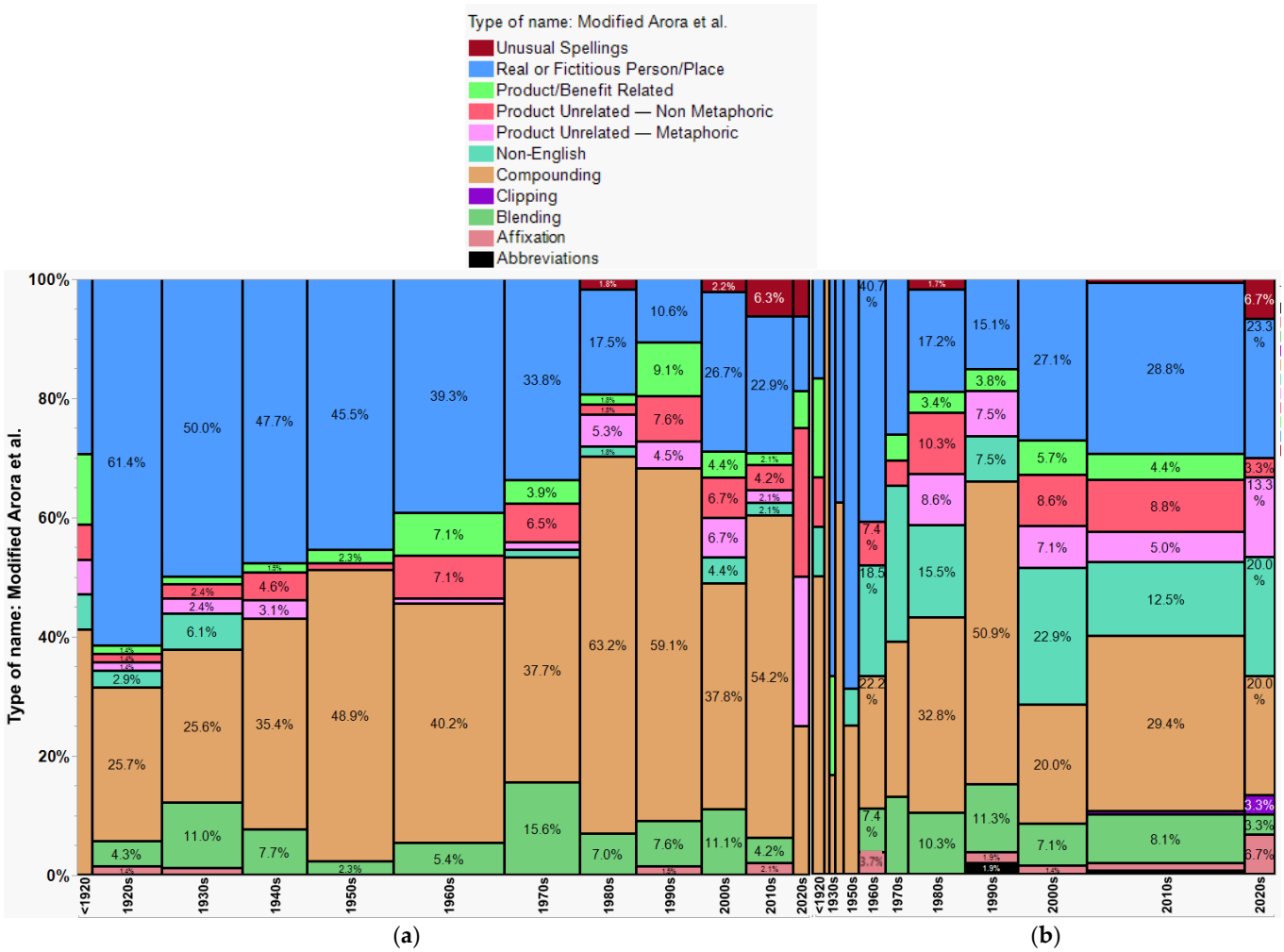


Figure 8. The mosaic plots of Framework II (modified Arora et al. [91]) name categories by the era of introduction in (**a**) North American (n = 743) and (**b**) internationally (n = 468) bred apples. The width of each column in the mosaic plot represents the number of items in the grouped decades, while the color distribution within each column shows the relative frequency of each name category.

3.3.3. Multiple Correspondence Analysis

The MCA results in Figure 9 illustrate both frameworks based on the decade of apple introduction. The categories '<1920' and '1920s' have been combined as '<1930s', and 'after 2020s' has been combined with the 2010s and renamed '>2010s' because of sample size considerations.

In North American bred apples (Figure 9a), approximately 69% of the variation is explained by the two displayed dimensions. Partial contributions to inertia for the row and column point data indicated that the first dimension, accounting for 53% of the variation, represents the impact of time as follows: the left side includes older releases, while the right-side features newer releases. The second dimension in this graph accounts for 15.7% of the variation. At the bottom are 'Namesake' or 'Real or Fictitious Person/Place' names and their combinations. Moving upward, 'Sensory' names and their combinations are located around the center, while 'Other' name categories are positioned at the top.

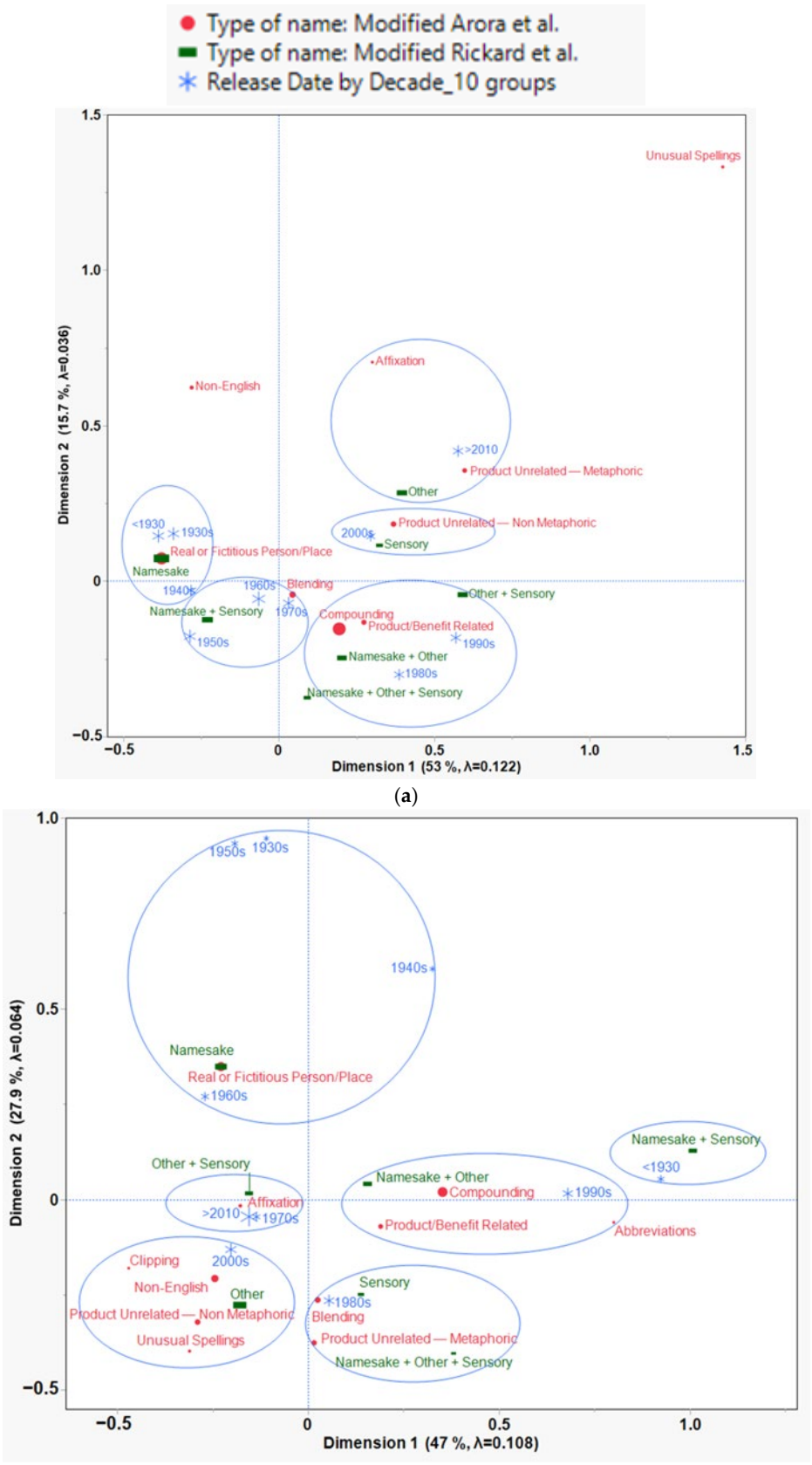


Figure 9. Multiple correspondence analysis (MCA) of apple name categories from two modified classification frameworks [9,91] by the era of introduction in (**a**) North American (n = 743) and (**b**) internationally (n = 468) bred apples. The size of the symbols represents the sample size for each category, and the large blue circles show groups.

- The 'Namesake' and 'Real or Fictious Person/Place' categories were prevalent and overlapping from before 1930 to the 1940s.
- The 'Namesake + Sensory' and 'Blending' categories became common from the 1950s until the 1970s.
- In the 1980s and 1990s, the use of combined categories (i.e., 'Other + Sensory', 'Namesake + Other' and 'Namesake + Other + Sensory'), 'Compounding', and 'Product benefit related' categories were more prevalent.
- The trend in the 2000s shifted to names from the 'Sensory' and 'Product Unrelated—Non Metaphoric' categories.
- Since the 2010s, names from the 'Product Unrelated—Metaphoric' category became more likely, along with some 'Affixation' and 'Other' category names.

In internationally bred apples (Figure 9b), approximately 74.87% of the variation in name categories is explained by the two displayed dimensions. Partial contributions to inertia for the row and column point data indicated that the first dimension, accounting for 47% of the variation, explains the type of name category, whether it is related to 'Sensory', 'Product benefit related', or 'Compounding' name categories, with these categories falling to the right and the rest to the left. The second dimension, accounting for 27.9% of the variation, mainly illustrates the influence of time, with earlier decades appearing at the top and more recent ones at the bottom. Below is a summary of the results:

- The 'Namesake + Sensory' category was more common before 1930.
- Similarly to the results from North America, the 'Namesake' and 'Real or Fictitious Person/Place' names were mostly related to old varieties introduced between the 1930s and 1960s.
- The 'Sensory', 'Blending', 'Product Unrelated—Metaphoric', and 'Namesake + Other + Sensory' categories were more prevalent in the 1980s.
- The 'Namesake + Other', 'Compounding', and 'Product/benefit Related' categories were more common in the 1990s.
- The 'Other', 'Product Unrelated—Non Metaphoric', 'Unusual Spellings', 'Non-English names', and 'Clipping' categories were notably observed around the 2000s.
- The 'Sensory + Other' and 'Affixation' categories were more common in the 2010s and beyond.
- Interestingly, there are overlaps between the 1970s and more recent names.

4. Conclusions

Understanding markets and consumers is essential before creating a new brand name for a fruit variety, helping avoid mistakes and identifying opportunities for naming and creativity. This study highlights the importance of brand name classifications in name creation and selection; familiar names have their benefits, but unusual ones may offer better long-term marketing opportunities. Key brand name criteria include trademarkability, simplicity, distinctiveness, meaningfulness, verbal/sound associations, mental imagery, emotions, repetitive sounds, morphemes, and phonetic sound symbolism. Creating a brand name is both an art and a science, involving multiple criteria and potential trade-offs. While a strong brand name is crucial for product success, it is not the only determinant. For example, a new apple must meet consumer preferences in flavor and texture and address supply chain needs from growers to retailers. A strong brand name supports the overall marketing strategy, but thorough testing is essential to ensure it is favorable and unique. This review emphasizes the importance of congruence in naming and marketing. The best results occur when the brand name aligns with its label, emotional appeal, semantic meaning, and market positioning. Naming conventions have evolved over time. The use of names associated with real or fictitious persons/places (or the 'Namesake' category) has decreased,

while 'Compounding', 'Product Unrelated—Metaphoric' names, 'Unusual spellings', and 'Abbreviations' have increased due to the need for names that convey qualities, attract attention, can be trademarked, and support brand image and marketing campaigns. Some categories, like 'Product/Benefit Related' and 'Blending' names, have remained consistent since the 1960s. The study mainly focused on dessert and dual-purpose apples bred and marketed in North America and internationally, using information from English sources. Excluded were regional varieties from regions other than North America, e.g., certain European apples marketed locally. Therefore, a comprehensive list for North American varieties may lack some internationally unregistered names. Defining the audit scope by the target market is common in similar studies, with results often presented independently for different regions, as has been carried out in this study. This brand name audit is part of a broader brand language audit. Future studies could explore other elements like tag lines, slogans, and website descriptions. In summary, the meticulous effort in creating and selecting a new brand name lays the foundation for a product's long-term success.

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