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"Good" vs. "Bad": An Empirical Analysis of the Brand Names of Coronavirus Vaccines

Abstract

Brand names are assets in marketing: a good name can help to sell products. Although research has made several recommendations on how "good" brand names should be created, the complex process is not easily adapted to every product category. Little research is done on a particular product category: the brand names of vaccines. This paper contributes to vaccine brand names in light of the coronavirus pandemic. The theoretical part of the paper first describes the characteristics of "good" and "bad" brand names, and then the focus is narrowed down to the characteristics of drug brand names and to the processes that influenced the naming of coronavirus vaccines. In the empirical part of the paper, Hungarian students perform brand recognition, recall, and association tasks connected to vaccine brand names. It will be shown that the vaccines are known by their public brand names (e.g., *Pfizer*) and not by their actual brand names (e.g., *Comirnaty*). The rating of the brand names shows that public brand names are considered to be better than the actual brand names, while brand associations collected for the actual brand names show mixed results. In the last part of the paper, theoretical implications are discussed, and recommendations for pharmaceutical companies are formulated to show what steps these companies could take to overcome the impasse between public and actual brand names.

Keywords

1. Introduction

Brand names are part of our everyday life: we meet them on the streets, in an office, at home, or online; we may purchase products because their names appeal to us, and we use them as anchors in complex purchasing situations. As Kohli, LaBahn, and Thakor (2001, p. 453) state, brand names represent the most valuable assets a company can have. Burman et al. (2022) even define brands through brand names: „A brand can be understood as the sum of all the perceptions that a brand name or a brand mark evokes […]". Baumgarth (2008) emphasizes that brand names can be used for positioning.

Companies are aware of the importance of brand names: they invest in developing and protecting new names (see Bugdahl, 2005; Kircher, 2019; Platen, 1997). Other companies misuse well-established names: they sell their products – legal or in a legal grey zone – under names that may be confounded with these well-known and sought-after names.

In the case of coronavirus vaccines, brand names are even more critical: they promote a product that can actually save lives. The names must persuade primarily health specialists and public organizations to buy a vaccine, but secondly also private consumers to get vaccinated.

The creation and acceptance of coronavirus vaccine brand names happened under extraordinary circumstances: As we will see, at the time of official naming, the products already had names used by the public and media. A vaccine was known, for example, under the name *Pfizer*. However, these

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names were not coined by the companies but rather by the mass media, which continuously reported on the vaccine development process. This resulted in a dual naming: Although the vaccines had protected brand names (e.g., *Comirnaty*), they were mostly known to the public by company names (e.g., *Pfizer*).

The paper aims to show the context of vaccine brand names: first, it characterizes "good" brand names, then it gives insights into branding medicine products and shows how the names of coronavirus vaccines were created. The empirical part of the paper analyzes to which extent the public accepted these names.

The topic and the results have both theoretical and practical implications. The theoretical part shows that brand naming is not controlled by a company in every case: brand names can be 'created' and coined by the public. In this context, in the paper brand names are used for identification purposes only and do not imply endorsement.

2. Literature overview

2.1. Research in brand names

Literature on **brand names** is expanding: brand names are researched from marketing (see Bugdahl, 2005; Kircher, 2019; Langner & Esch, 2019; Rivkin & Sutherland, 2004), linguistic (see Kovács, 2019; Platen, 1997, Praninskas, 1968; Ronneberger-Sibold, 2004) or legal perspective (see Bently et al., 2008; Shuy, 2002). Marketing-oriented brand name research sees brand names as names that facilitate the market success of products (see Keller, 2013), while linguistic-oriented research concentrates on brand names as linguistic signs (see Kovács, 2019; Ronneberger-Sibold, 2004). Finally, the legal perspective of brand names is centered around the legal protection of brand names (Bently et al., 2008).

Marketing-oriented research on brand names seeks to answer the question of how – and whether – a given name can help sell products (Keller 2013). In this regard, brand names function as anchors: they provide support for consumer decisions. However, not only consumers, but also companies benefit from brands and brand names (Table 1).

Advantages for companies	Advantages for consumers
Brands enable differentiation and segmentation (e.g., mass – premium – luxury)	help with identification
justify higher prices	give information about the quality of the product
help secure market share	assure constant quality
help with customer loyalty	help to make purchase decisions
contribute to the company's value	minimize risk
names or other components of a brand can be legally protected	minimize search effort
facilitate the introduction of new products	can express prestige and group affiliation

Table 1. Advantages of brands and brand names based on Gordon et al. (2016), Keller (2003), Keller (2019), Kotler et al. (2013), Meffert et al. (2002).

Linguistic-oriented research is neutral: it describes the characteristics of brand names. Linguistics research on brand names belongs primarily to the area of onomastics. From the onomastic viewpoint, brand names belong to the category ergonyms (cf. Brdar & Brdar, 2023; ICOS 2021; Nübling et al. 2012). Sjöblom (2014) sees brand names as belonging to the category of commercial names, which is (partly) a hyponym of ergonyms.

Brand names can be researched in linguistics in many additional contexts: it is possible to analyze the meaning (Lerman, 2007), the sound symbolic effects (Klink, 2000, 2003; Shrum & Lowrey, 2007), or the origin of the brand names or describe brand naming trends (Bugdahl, 2005; Landa, 2006; Rivkin & Sutherland, 2004). The linguistic characteristics of brand names, however, are connected to their marketing context: the linguistic characteristics of brand names can help sell products.

2.2. "Good" "and bad" brand names

From a marketing perspective, brand names can be considered as "good" or "bad". "Good" and "bad" brand names exist, however, only from a marketing point of view: **"good" brand names** help to sell the product, while **"bad" names** make it difficult or impossible to market goods (Rivkin & Sutherland, 2004).

From a linguistic view, brand names are neutral objects of research. Thus, "good" and "bad" are not inherent characteristics of the names but the result of an analysis from a very particular perspective: that of marketing.

"Good" and "bad" are also not general characteristics of brand names: a brand name can be "good" for a given product at a given market and "bad" for the same product in another market. The luxury car *Rolls-Royce Silver Mist*, for example, had to be renamed to *Rolls-Royce Silver Shadow* in Germany because the word Mist means in German 'dung', which – understandably – did not match the image of a luxury car (Platen, 1997). Thus, the same name can be "good" or "bad", depending on the market.

In marketing and brand literature, several authors tried to describe the characteristics of "good" and "bad" brand names. One of the early attempts to describe "good" brand names was made by Robertson (1989, p. 69), who considered the following points:

1. The brand name should be a simple word.
2. The brand name should be a distinctive word.
3. The brand name should be a meaningful word.
4. The brand name should be a verbal or sound associate of the product class.
5. The brand name should elicit a mental image.
6. The brand name should be an emotional word.
7. The brand name should make use of the repetitive sounds generated by alliteration, assonance, consonance, rhyme, and rhythm.
8. The brand name should make use of morphemes.
9. The brand name should make use of phonemes.

One and a half decades later, Rivkin & Sutherland (2004, pp. 65-76) formulated similar recommendations for "good" brand names, from which some are easily understandable (names should be short) while others ("pleases the ear in any language") are harder to interpret.

For "good" brand names, Platen (1997) mentions the importance of connotations, while Keller (2013) emphasizes – among others – the importance of easy pronunciation and the relevance of differentiation through the names.

Kircher (2019, pp. 608-612) uses a shorter list and highlights that successful brand names must be unique, serious and memorable. She also emphasizes the importance of legal protection and stresses that the names should be suitable in the given linguistic and cultural context (cf. de la Cova 2021).

Literature also describes "bad" brand names. "Bad" names are hard to pronounce (*Coryphaeus Software*), too general (*Beer*), are not suitable for the given product category (*Hotpoint* as a refrigerator), bear negative associations (*French's Mustard*), are technical words (*eServer z 990*), or are too long and chaotic (*BankAmerica Robert Stephens*) (Rivkin & Sutherland, 2004, pp. 78-84). In the case of *French's Mustard*, the negative associations are due to the anti-French sentiment in the United States in the early 2000s (Rivkin & Sutherland, 2004). These negative feelings were transferred to the brand, despite the fact that it is a US brand and only the name of the founder was Robert Timothy French (Rivkin & Sutherland, 2004: 147). Although these characteristics of "bad" brand names can be debatable, "bad" names exist, however, when a brand name in a given language evokes associations that are not suitable for the product (Platen, 1997).

The following section narrows down the perspective of branding and brand naming to medicine, more precisely to pharmaceutical products.

2.3. Branding pharmaceutical products

Since only a few papers analyze vaccine brand names (see point 2.4), we consider it necessary to overview the branding process of a superior product category, thus we describe the characteristics of branding pharmaceutical products with an emphasis on drug brand names.

Brands and brand names are widely used in medicine: drugs with brand names are common today, although drugs with general names also exist (see Ledan, 2020; Moss, 2001; Moss & Schuiling, 2004; Park et al., 2021; Pires et al., 2016; for a comprehensive overview see Blackett & Robins, 2001, for a historical overview see Greene, 2011).

Brands in the pharmaceutical industry facilitate the selling of products. The advantages of branding in the pharmaceutical industry are the same as the advantages of branding products in other industries (cf. Table 1 above). Brands in the pharmaceutical industry:

1. build a relationship with the customer,
2. they enable competitive differentiation,
3. they can be used internationally and across different sectors,
4. they influence behavior and attitude,
5. can lead to consumer loyalty (Blackett, 2001, pp. 15-16).

Branding in the pharmaceutical industry can be performed on three different levels: we can differentiate corporate brands (e.g., *Astra, Sandoz, Pfizer*), therapy area brands (brands active on one specific therapy area; e.g., *Glaxo, Smithkline Beecham*), and product brands (e.g., *Prozac, Claritine*) (Moss, 2001: 28-29). From the three categories the first two bear, in most cases, the names of the producing – or the sales – company, while the third is a unique, protected name for a given product.

Since brand names of drugs can influence the perception of the characteristics of the drug, names must be carefully chosen. For example, drugs with more complex names are perceived as more hazardous (Dohle & Siegrist, 2014), and drugs with voiced consonants (e.g., [b], [d]) are perceived as more effective as drugs with voiceless consonants (e.g., [f], [s]) in their brand names (Park et al. 2021).

What are, thus, considered as characteristics of "good" brand names in the pharmaceutical industry? The specific recommendations are in line with general recommendations to "good" brand names. According to Robins (2001), "good" pharmaceutical brand names must be legally protectable, have no negative connotations, and they should be:

- easy to pronounce,
- easy to write and read (to avoid prescription errors),
- memorable and attractive to the target audience(s),
- distinctive and differentiated from the competition (Robins, 2001, p. 157).

Despite the similarities to other product categories, when creating brand names for pharmaceutical products, we have to consider several peculiarities of pharmaceutical brands, like the target consumer groups and regulations.

Concerning target groups, pharmaceutical brand names can target two different consumer groups: on one side, professionals prescribing medicaments, and on the other side, the users of these medicaments (Robins, 2001). The two target groups are different:

1. The physicians prescribing or recommending medical products have extensive knowledge of how a given medicine – and its ingredients – works.
2. The consumers who buy and use the medical product have no such knowledge: They rely on the knowledge of the physician, they can be, however, – in the case of over-the-counter drugs – also influenced by advertisements (Catlett, 2001; Cooper, 2001).

As an example consider a brand name using morphemes of the active ingredient (e.g., *Ibutop, IBU*, or *Ibuprofen*). These names tell both groups the drug's active ingredient (ibuprofen). Consider, however, the brand names *Advil* or *Motrin*. In the case of these drugs, the ingredient is not apparent: only experts know the active ingredients of these branded medicines, although the active ingredient is the same, ibuprofen.

Concerning regulations, the created names need to contemplate not only the product itself, the target audience(s), and brand names of the competitors, but also legal recommendations and regulations connected to pharmaceutical brand names (Cooper, 2001; Robins, 2001). These regulations are complex and may vary from market to market. One context is, however, obvious: drug names should not be similar to other drug names or to drug names with other active ingredients, and they should not include inactive ingredients in the name (Faure, 2018). The reason is, that similar drug names may confuse consumers – or even physicians – which can result in medication errors (see Aronson, 2004; Lambert et al., 2005). For the same reason, misleading names or name elements connected to general drugs should also be avoided (Faure, 2018).

Creating brand names for drugs is not easy. The fact, that the focus of branding connected to drugs is often global adds more challenge to brand name creation (see Cooper, 2001). Researching possible names to find a suitable, "good" name takes time: this why, in general, in the case of pharmaceutical products the marketing process is parallel to product development (Cooper 2001).

All these aspects increase the costs of the development of a brand name. Naming drugs can cost companies several hundred thousand dollars (see Collier, 2014; Faure, 2018), and pharmaceutical brands are presumably the most research- and resource-intensive brand names to develop (Bugdahl, 2005). When naming a drug, not only is the name created and coined, but brand benefits and brand language are developed parallel with the product to achieve longevity (Cooper, 2001; Robins, 2001), adding to the costs of naming.

In the next section, we narrow the focus to a particular group of pharmaceutical products: vaccines, and we focus on the names of coronavirus vaccines.

2.4. Branding vaccines: Challenges and solutions

Little research has been done on vaccine brand names, although vaccines have been used since the end of the 18th century (Plotkin 2014). We must assume that for vaccine brand names the same processes and considerations apply as for other brand names in the pharmaceutical industry (Davidovic, 2021).

Brand names for vaccines are common; however, unambiguous identification of vaccines – e.g., with international letter/number codes – is called for to avoid medication errors (D'Arrigo, 2017; Maurer, 2000). Creating "good" brand names for vaccines is paramount: Well-chosen names increase trust and the willingness to get vaccinated (Mushi et al., 2008).

In 2020, however, the vaccines developed against coronavirus were not branded: they were known to the public by the name of the company producing and/or developing them (e.g., *Pfizer, Moderna, AstraZeneca*) (Davidovic, 2021). In the case of *Pfizer*, for example, the vaccine was widely known by the name of the company that was commercializing the vaccine (*Pfizer*) and less so by the name of the developing company (*BioNTech*) (Davidovic 2021). These names were not only occurring in the news, in traditional or social media; scientific papers also used them (e.g., Noor, 2021).

These brand names connected to the vaccines are not official, protected brand names of vaccines; they are the names of the companies producing vaccines. They function, however, for the public as brand names: they identify and differentiate the vaccines. At this point, for the next parts of the paper, we need to introduce two terms: **public brand name** and **actual brand name**. The *public brand name* is the name that is used for vaccines by the public (e.g., in mass media, by governments, in social media). These are mostly company names (e.g., *Pfizer, Moderna, AstraZeneca*). The *actual brand name* is the protected brand name of the vaccine, developed for branding purposes (e.g., *Comirnaty, Spikevax, Vaxzevria*).

The actual brand names of several vaccines were created by The Brand Institute, one of the leading naming companies worldwide: They named *Pfizer*'s vaccine *Comirnaty, Moderna*'s *Spikevax, AstraZeneca*'s *Vaxzevria, Novavax*'s *Nuvaxovid,* and *Sanofi* and *GlaxoSmithKline*'s *Vidprevtyn* (Bulik, 2022; Schwartz, 2022). These brand names had to meet several regulations (see European Medicines Agencies, 2014; in general, Robins, 2001).

According to Bulik (2022), these actual brand names of vaccines were generated through the following considerations:

- *Comirnaty* (*Pfizer* and *BioNTech*): co=refers to Covid; mirn=mRNA technology; com=community; ty=immunity;
- *Spikevax* (*Moderna*): spike=refers to the spikes of the virus + also is a term for a special attack move in volleyball; vax=vaccine;
- *Vaxzevria* (*AstraZeneca*): vax=vaccine; evri=for everyone;
- *Nuvaxovid* (*Novavax*): nuva=refers to the company name; vax=vaccine; ovid=Covid;
- *Vidprevtyn* (*Sanofi* and *GlaxoSmithKline*): vid=Covid; prev=prevention; tyn=a closed syllable indicating strongness.

Although the names were in line with regulations (see Bulik, 2022; Schwartz, 2022), the acceptance of the names among the public was, however, at least ambiguous: they were called 'goofy' (Campbell, 2021).

Davidovic (2021) describes, from the point of view of a branding expert, the dynamics and background that influenced the branding of the coronavirus vaccines. As a reason and result for not optimal branding the new vaccines, he points out that:

- time was short, and companies had to focus on trials and production, not on marketing.
- More vaccine variants may be needed to be developed, which implies future confusion in (new) names.
- It is and was not clear who is "in charge" of the vaccines: research teams, marketing teams, PR teams, or the government, which also undertook marketing efforts.
- The customer is not clearly defined: are they the people who get vaccinated, or physicians or governments and health systems?
- Marketing limitations were due to regulations, at least in the US: the vaccines had only Emergency Use Authorization, which restricted marketing communication (Davidovic, 2021, pp. 105-108).

The exact date of the naming and the introduction of the actual brand names is unclear. The information, when the names were generated could be important, however. When the actual brand names were generated well before the vaccines appeared in the news, this would indicate a fault in marketing communications: it would mean that the names already existed, the companies were, however, unable to communicate these names. On the other hand, when the media used public brand names well before the actual brand names were created, it would mean that the public names for vaccines were already – publicly – coined at the time of the actual brand name creation. The second possibility implies that the actual names had to assert against names extensively used in worldwide mass media.

The name *Comirnaty* was already developed, but new at the end of 2020 (Bulik, 2020). The vaccines of *Pfizer*, *Moderna* and *AstraZeneca* were already in use in early 2021 (Fortner & Schumacher, 2021). Since the exact date of the introduction of the actual brand names is not clear, an analysis of Google Trends (Google's search history) can reveal when these names first appeared in searches worldwide (Table 2).

Vaccine name	First frequent searches for the names worldwide	Company name	First frequent searches for the names worldwide
Comirnaty	20-26. December 2020	*Pfizer* *BioNTech*	8-14. November 2020 8-14. November 2020
Spikevax	20-26. June 2021	*Moderna*	no clear trend several frequent searches after May 2020
Vaxzevria	28. March-03. April 2021	*AstraZeneca*	28 February-06 March 2021
Nuvaxovid	07-13. November 2021	*Novavax*	no clear trend
Vidprevtyn	18-24. July 2021	*Sanofi* and *GlaxoSmithKline*	no clear trend

Table 2. First searches for vaccine brand names according to Google Trends. Note: In the case of all names – except for *Comirnaty* – sporadic searches to these names also happened before these dates, at least back in 2017. In the case of company names the trends are less clear, since they are existing pharmaceutical companies with several products and brands.

As we can see from Google Trends, company names (public brand names) were searched for frequently weeks or months before search for the actual brand name started. It is important to

note, however, that Google Trends do not provide search frequency in numbers (how many searches occurred for a given name), it indicates the trends only in points; the peak is in every case 100 points. We must assume, however, that the public brand names of the above-mentioned vaccines were – due to mass media – known worldwide earlier as actual brand names.

Some vaccines, however, were not used worldwide and were, therefore, less in the focus of worldwide media news. These vaccines were used only in a given – smaller or larger – region. In Hungary, for example, the Russian-made *Sputnik V* vaccine (*Sputnik*='fellow traveler', also the name of the first human-made satellites; *V*=Vaccine) and the Chinese *Sinovac* vaccine (=*Sinopharm Vaccine; Sino*='Chinese') were widely used in early 2021. The Chinese vaccine was referred to mostly simply as the *Sinopharm* vaccine (cf. Kondorosy et al. 2023). In the further analysis, we focus, however, on the names of vaccines that were used worldwide because almost no information is available on the exact naming processes and naming contexts of the *Sputnik* and *Sinovac* vaccines.

As Davidovic (2021) pointed out, the brand name creation for the coronavirus vaccines was different from the name creation process common in the pharmaceutical industry. The question arises, how the double naming process (public and actual brand names) influenced consumer perception of these names and whether the actual brand names generated under extraordinary circumstances perform with consumers as expected?

In the next step, we analyze the actual brand names – recall, recognition, and associations – from the consumer's point of view. We seek answers to the following questions:

- RQ1) Can consumers recall the actual brand names of vaccines?
- RQ2) How do consumers rate public and actual brand names?
- RQ3) What associations do actual vaccine brand names elicit?

3. Data and methods

As we see, vaccine names were developed under extraordinary circumstances: vaccine names entering media were not created by marketing experts; experts only created names after vaccines were widely in media discussions and partly in use. To see how well-known the actual brand names of vaccines are and to answer the above research questions, an experiment was run in early 2022 in Hungary to test these brand names.

The participants were 107 Hungarian undergraduate business students (Eötvös Loránd University, Campus Savaria) with an online questionnaire open between March and May 2022, using Google Forms. The first questions were demographic questions and questions related to coronavirus-related news consumption. The remaining questions were connected to the brand names of vaccines. All questions were asked in Hungarian.

61% of the participants were women, 39% were men, 81,3% were between 18-25 years old, and 12,1% between 26-35 years old. 99% of the participants were native Hungarian speakers, 91,5% had (at least basic) knowledge of English, and 60,7% had (at least basic) knowledge of German. Hungarian, being a Finno-Uralic language, is not related to Indo-European languages like English or German. The viewpoint of a non-Indo-European language is essential, however, since the vaccines were marketed worldwide; thus, the names must also be known to and accepted by not native speakers of Indo-European languages.

According to the answers concerning coronavirus-related news consumption, participants read news connected to the epidemic, mostly in Hungarian and partly in English. They preferred Hungarian national news sites, official Hungarian (government) sites, and information from social media. They used international news sites and traditional Hungarian media (newspapers, television,

radio) much less for collecting information, and they only seldom accessed traditional international media or special international sites dedicated to the pandemic (e.g., Worldometer, Healthdata).

The first question concerning the brand names of vaccines asked participants to recall vaccine brand names and is connected to RQ1. In the first question, we applied the method of Geissler (1917) – an open, brand name recalling test – and asked participants to name coronavirus-vaccine brand names. The method is valid for evoking brand names connected to a given product category (Fazio et al., 2000).

The second question was a brand name recognition test (in line with Schmitt et al. 1993), in which we asked the participants to state whether a given name is the name of a vaccine. The tested names were the following: *AstraZeneca, Biontech, Comirnaty, CoronaVac, Covaxin, Janssen, Moderna, Nuvaxovid, Pfizer, Sinopharm, Spikevax, Sputnik V, Vaxzevria,* and *Vidprevtyn*. From the tested names *Comirnaty, CoronaVac, Covaxin, Nuvaxovid, Spikevax, Sputnik V, Vaxzevria*, and *Vidprevtyn* are vaccine brand names, while the other names are the names of pharmaceutical companies. In the third question – connected to RQ2 – we asked the participants to rate these names on a five-point Likert scale (see Bosshard et al., 2016; Tavassoli, 2001).

In the last five questions – connected to RQ3 –, we asked participants to name any words that came to their mind when reading the brand name/word *Comirnaty, Spikevax, Nuvaxovid, Vaxzevria,* and *Vidprevtyn* (RQ3); thus, we collected brand associations. Collecting brand associations is an established method for evaluating and testing brand names (see Aaker, 1991; Franzen & Bouwman, 2001; Keller, 2013). With the help of brand associations, the brand's position in the mind can be analyzed: the words the brand name is connected to in the mind show not only the current position of the brand but also enable the identification of key brand communication elements (see Kovács, 2019; Kovács et al., 2022; Franzen & Bouwman, 2001).

We asked no questions – because of the sensitivity of data – concerning the vaccination of the participants; thus, we must rely on secondary data. Concerning the vaccines used in Hungary, the official government site states in early 2022 (time of data collection), that Hungary obtained from the EU over 10 million *Pfizer-BioNTech*, over 6,3 million *AstraZeneca*, almost 4 million *Janssen*, over 1,7 million *Moderna* and from not EU-sources 2,6 million *Sinopharm* and over 2 million *Sputnik* vaccines (koronavirus.gov, 2022a; note: the vaccine names are copied from the official website, only *Sputnik* is written in its Hungarian version (*Szputnyik*) on the site). On the 31st of March, 6,402 million people were vaccinated in Hungary at least one time with one vaccine (koronavirus.gov, 2022b).

4. Results

In the first question connected to vaccines, we asked students to name Covid vaccines ('What coronavirus vaccine brands do you know? If you know some, please list them!'). No restrictions – either on spelling or on the number of vaccines one can name – were given. Altogether 403 vaccine names were collected (average: 3.76 vaccine names per participant; Table 3).

Named vaccines	Number of mentions
Pfizer	96
Moderna	72
Szputnyik / Sputnik / Sputnik V	66
Sinopharm	45
Johnson & Johnson	35
Janssen	18

Pfizer BioNTech / BioNTech Pfizer	5
Sinovac	2
Covishield	1
Delta	1
Kínai (=Chinese)	1
Omikron	1
Orosz (=Russian)	1
Oxford AstraZeneca	1
Pfizer (Comirnaty)	1
Altogether	403

Table 3. Number of mentions of Covid vaccines. The spelling variants/misspellings are standardized.

As we can see, by the recalling test, the companies producing vaccines / bringing vaccines to market are named most frequently. As we have seen, these are the public brand names used for vaccines in media. From the actual brand names of vaccines, *Sputnik* is the vaccine that was named most frequently (vaccination with *Sputnik* and *Sinopharm* started in Hungary in February 2021; koronavirus.gov 2021a; koronavirus.gov 2021b). As we can see, more complex names like *Pfizer BioNTech* and *Oxford AstraZeneca* were also recalled.

The next question was a brand name recognition test and asked the participants to identify coronavirus vaccine names ('Please indicate which of the following you think are the names of the coronavirus vaccines') (Figure 1).
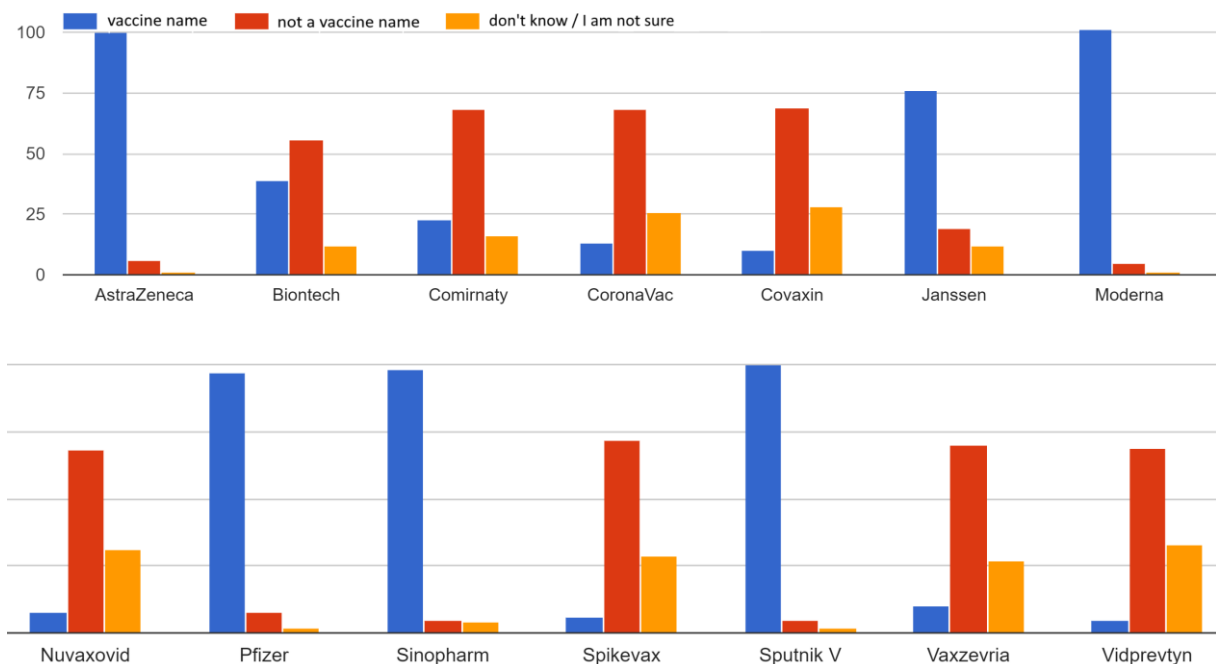

Figure 1. Results to the question: 'Please indicate which of the following names you think are the names of coronavirus vaccines'.

As it can be seen, in the recognition test – although the actual vaccine brand names are recognized to some extent (e.g., 21,5% of the participants thought that *Comirnaty* was the name of a vaccine) – primarily public brand names are believed to be the vaccine names.

In the next question (Figure 3), we asked participants to rate brand names connected to vaccines on a five-point Likert scale ('How good do you think the following names related to coronavirus vaccines sound? 1 = very bad name; 5 = very good name; can't judge').
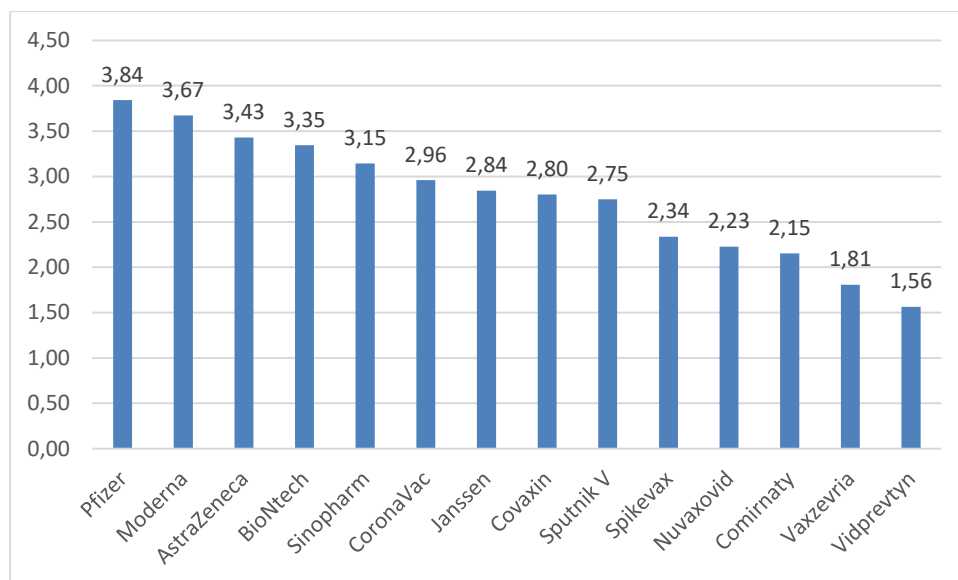

Figure 3. The rating of brand names connected to vaccines on a 1-5 scale, n=107.

As we can see, the sounding of actual brand names of vaccines is rated lower, while public brand names (e.g., *Pfizer, Moderna*) are rated higher.

In the next step, we made a brand association experiment to test the words elicited by the brand name (see, e.g., Kovács, 2019): We asked the participants for the first idea that comes to their mind when hearing the actual vaccine names (*Comirnaty, Spikevax, Vaxzevria, Nuvaxovid, Vidprevtyn*). The question was formulated as 'What words come to your mind when you read the following brand name/word?' There were no restrictions on how many words could be named (Table 4).

Comirnaty	Number of mentions
no idea	21
Pfizer	13
vaccine	11
Covid	6
community	5
disease	3
medicine	3
foreign	3
mRNS (=mRNA)	2
west	2
physician	2
Russia / Russian / Slavic / Soviet	5
Σ	127

Nuvaxovid	Number of mentions
Covid	24
no idea / unknown	14
medicine	10
vaccine	7
new (cf. novum)	7
chemistry	3
physician	2
kindergarten	2
virus	2
Σ	117

Spikevax	Number of mentions
vaccine	20

Vaxzevria	Number of mentions
no idea	19

no idea	12		Russian/ Polish / Serbian / Slavic	13
spike	10		wax	5
resin/rosin	6		*medicine*	4
wax	6		*AstraZeneca*	4
hair wax	4		resin/rosin	3
Moderna	4		hair wax	3
dog	3		*virus*	2
spider	3		untrustworthy	2
Covid	2		foreign	2
spike vaccine	2		Balkans	2
spike protein	2			
Σ	121		Σ	108

Vidprevtyn	Number of mentions
Russian / Russia	29
no idea	25
Slavic/Ukrainian/steppe/vodka/Polish/Putin/soviet	9
vaccine	7
prevention	7
unpronounceable / complicated / misspelled	6
video	3
medicine	2
otter (=hun. vidra)	2
Σ	110

Table 4. Associations (named at least two times) for the vaccine names *Comirnaty, Spikevax, Vaxzevria, Nuvaxovid, Vidprevtyn*. Σ = all associations, including single mentions. Associations clearly connected to the vaccines are in italics. All associations were in Hungarian; the associations were translated into English by the author.

We must point out, however, an essential context to the collected associations: at the time we asked for explicit associations for these names, the participants had already met these names in the previous questions, which may have influenced their answers.

5. Discussion
5.1. Recall, rating, and mental images
To the first research question – RQ1: Can consumers recall the actual brand names of vaccines? – we can answer that the actual brand names could not be recalled by the participants. The same is true for the Chinese *Sinopharm* vaccine: as we mentioned earlier, the official name of the vaccine is *Sinovac*, although mass media and the government called it *Sinopharm*. In the case of *Sputnik*, the actual brand name and public brand name are the same.

We have no evidence of how often these names occurred in mass or social media in 2022 (date of data collection). Throughout 2021, however, an experiment used the method of social media listening in Hungarian social media to analyze social talk connected to coronavirus vaccines (Kondorosy et al., 2023). Using the social listening tool SentiOne, they showed that the brand name *Pfizer* dominated social media, followed by *AstraZeneca. Moderna* or *Sinopharm* came in third place of mentions, depending on the month of the year, and *Sputnik* was in 5th place. From June 2021 social media mentions of vaccine names decreased significantly. We must note, however, that the research did not look for the actual brand names. These results are somewhat different from our naming experiment, although in both cases, the name *Pfizer* dominated. Differences are due to the

used method (social media listening vs. free association) and to the date of the data collection (2021 vs. spring 2022).

To the second research question – RQ2: How do consumers rate actual and public brand names? – the answer is that actual brand names are rated more unfavorable than public ones. These ratings must not mean that the actual brand names are objectively "bad": the rating may well be connected to the familiarity of the name, meaning that from media familiar names are rated higher, while unfamiliar names are rated lower. Although it is proven that brand knowledge, familiarity and product characteristics may influence brand perception (cf. Breneiser & Allen, 2010; Rangaswamy, Burke & Oliva, 1993), we must note that connected to vaccines, no brand experience exists (e.g., previous use, taste, packaging, advertisements) which can be analyzed.

To answer the 3rd research question – RQ3: What associations do actual vaccine brand names elicit? –, we have to take a closer look at the collected associations.

As we can see from the results, in the case of *Comirnaty, Nuvavoxid*, and *Spikevax* – if we include the word spike –, the elements of the brand names seem to be working since most associations are related to Covid, vaccines, or medicine. The names *Vaxzevria* and *Vidprevtyn* seem to have failed as vaccine brand names: both are most strongly connected to some Slavic languages and not to the pandemic.

We hypothesize that the morphemes used for brand name creation are only partly transparent to the participants. *Comirnaty* succeeds in eliciting *Covid*, the word *community*, and the reference to *mRNA*. From the collected associations, it seems that the morpheme *ovid* (*Nuvaxovid*) connects the name to Covid, while *vid* (*Vidprevtyn)* does not. *Spike* connects the names to spikes – it is not clear, however, whether participants are aware that spikes are connected to the coronavirus. The morpheme *prev* elicited prevention, while *evri* failed to elicit everyone. The morpheme *vax* seems to have failed: it connects the names to wax and not to vaccines, both in the case of *Spikevax* and *Vaxzevria*. Since, however, participants were not explicitly asked for this information, we can only assume the processes that lead to the associations.

5.2. Vaccine brand names: "good" or "bad"?

In the case of coronavirus vaccines, the branding process was a global one since vaccines were (and are) used and accessible in most countries of the world. At the time when the actual brand names were created and coined, the products were talked about in mass media, and they were partly already in use or marketed. Therefore, as already stated, the naming process was influenced by several brand-related, product-related, and situation-related factors (Davidovic, 2021) and was overlayed by the already established and in mass and social media communicated, partly from the society and media invented and coined public brand names (e.g., *Pfizer*). As pointed out, in the case of medicine brands – drugs – this is rather an uncommon situation.

As empirical results show, actual brand names for vaccines could be recalled in just a few cases, which implies that the names were a) not known to the participants or b) they could not remember those names. In any case, the recall of the names failed – instead, the public brand name (=the name of the company marketing the vaccines) was named, apart from *Sputnik*.

This result is in line with Davidovic (2021), who established that vaccines are known by company names and highlighted the different marketing strategies of the *Sputnik* vaccine. He points out that the *Sputnik* vaccine used a traditional marketing approach with a brand name, a logo, and a tagline and that the branding of *Sputnik V* and *Sinovac* can be considered more appropriate since these vaccine brand names are distinctive.

Comparing the actual brand names of coronavirus vaccines (*Comirnaty, Nuvaxovid, Spikevax, Vaxzevria, Vidprevtyn*) with the previously mentioned list considering the characteristics of "good" brand names, we must note that most of the recommendations for "good" names are not characteristic for the names of vaccines.

Concerning the recommendations for general brand names of Robertson (1989), the names are not simple; they are, however, distinctive, they are partly meaningful, they are not "verbal or sound associate of the product class", they elicit only partly the suggested mental images, they are less emotional and do not make use of repetitive sounds. Concerning the suggestions for brand names to make use of morphemes and phonemes, they fulfill these requirements – as does any other brand name.

Compared to the recommendations of Kircher (2019), the names are unique; they sound serious, but they are less memorable (see recall test). Legal protection is ensured, but their suitability for the given linguistic and cultural context and their fitness to be used for positioning are at least questionable.

Compared to the earlier recommendations for pharmaceutical names of Robins (2001, p. 157), we can conclude from the results that none of the names meets the first three of the criteria: they are not easy to pronounceable, nor are they easy to write and read, and they are also not memorable and attractive. They also bear associations that are not connected to brand names. However, they can all be seen as distinctive, differentiated from competitors, and protectable.

On the other side, we can see that market shares and share prices of the companies producing and selling vaccines increased and that the vaccines are sold several billion times, generating sales in billions (see Erman & Mishra, 2021; Mishra, 2022). However, we must emphasize that these sales numbers are connected to the pandemic; thus, we cannot judge how sales numbers would have been positively or negatively influenced by the public or actual brand names of the Covid vaccines. Are thus the brand names of vaccines "good" or "bad"?

5.3. General discussion

One common problem with "good" and "bad" names is that the decision, whether the name is "good" or "bad", happens mostly after the market success of the name is known; thus, market success is inherent in rating names (Kovács, 2019). It means that there is no analysis of, e.g., all names filed as trademarks: merely the names are analyzed (and partly categorized as "good" or "bad") that are on the market, implying that market performance may also be included in the analysis. Name, product, and market information are all present at the same time, leading to a brand name evaluation analysis ex post facto, resulting in judging the names after the performance of the name (and the product behind the name) is known. We do not know, however, whether a given product could have had better market shares with another brand name.

As we see, "good" and "bad" are relative terms according to brand names. Therefore, a name can seldom be called "good" or "bad" in and of itself. When deciding whether a brand name is "good" or "bad", we must evaluate the names for a specific product, in a specific linguistic context, in a specific market, and at a specific time (Kovács, 2019; Kovács, 2022). Thus, brand names are not "good" or "bad": they may be, for example, evaluated as "good" in a given market for a given product category but considered as "bad" in another market for another product category.

The relative characteristics of "good" and "bad" brand names implies that products with "bad" names can succeed and those with "good" ones can fail on the market (Kovács, 2019). Seeing the considerations connected to "bad" brand names, brand names such as *Fat Bastard* for wine or *Rubik's cube* for a puzzle are rather "bad" brand names: the first one is not suitable for the product

category, the last one is hard to pronounce. Market data contradicts, however, these assumptions: *Fat Bastard* was the best-selling French wine in the US for years (Grimes, 2011), while *Rubik's cube* is, after 40 years, still a cult object: millions are sold every year (Rubiks, 2022), it inspired design objects, it is part of the popular culture and lead even to the folk art rubikcubism.

In the case of Covid vaccines, media coverage, public brand names – and partly market share and market success of the products – existed before the actual brand names were created and/or introduced. This process created an unusual situation: the products were successful and were known by their public brand name used by society (e.g., *Pfizer*). These are known and presumably "good" names (compare Table 1, Figure 2, public brand names). On the other hand, the actual, later invented brand names are not or less known, and they seem not to fulfill the requirements of "good" names (compare Figure 1 and 2, actual brand names). Under these circumstances, it is not possible to decide whether the actual brand names are "good" or "bad". Although they may be seemingly considered as "bad", this seems, however, not to influence product selling because the products are good and because also a – "good"? – public brand name for the same products exists. That actual brand names are less known to the public may be influenced also by the fact that it is almost impossible to introduce and coin a "new" vaccine brand name when the same products already have a public brand name, which names resonates through worldwide mass and social media.

Another context, however, must not be lost sight of: branding and branding strategy of coronavirus vaccines was presumed to be an important factor in getting vaccinated (Evans &French, 2021), and it was found that the (presumably public) brand name of vaccines influenced the willingness to get vaccination (Pedroso et al., 2022). Thus, public brand names seem to have worked.

The above-described contexts lead us to two theoretical considerations. The first is connected to brand names. Sjöblom (2016, p. 454), in a widely accepted definition, describes a brand name as "a widely known, financially valuable name, which includes an image of the surplus value offered by the product". In the case of coronavirus vaccines, two brand names exist parallel: a public brand name, which is not protected and is the name of the producing/researching company, and an actual brand name, which is connected only to the vaccines. According to Sjöblom's definition, both names are brand names, which means that public brand names can exist and function as brand names and help sell products.

The second consideration is connected to the emergence of the public and actual brand names of vaccines. The case of coronavirus vaccine brand names shows that a dual process is possible: for the same product, a company-driven (actual brand name) and a company-independent (public) brand name creation can exist parallel, and despite the knowledge and resources put into the actual brand names, the public brand name can prevail.

6. Practical implications

Vaccines seem to remain with us for a long time: the question is, how will the pharmaceutical companies market these vaccines?

One possibility is to try to market the vaccines with the actual brand names and establish a connection between the public brand name and the actual brand name (e.g., explicitly communicating that the name of the *Pfizer* vaccine is actually *Comirnaty*). In this case, the process can be seen partly as a brand name change, with all the benefits and caveats of such a change (see Hamer, 2008).

An alternative is to use the already established public brand name for the vaccine (e.g., *Pfizer*) in communication. This decision can lead, however, to misunderstandings: when consumers believe *Pfizer* to be a vaccine name, other medicaments of the company may be less sought.

A third option is to differentiate and go both ways: while communicating to the public, the company could use the public brand name, and then in context with professionals and specialists, they could use the actual brand name.

A fourth option would be to create new names for vaccines that are better fit for the naming purpose. This step is again research-intensive and would include a brand name change (see Hamer, 2008).

By deciding on one of these approaches, the companies need to establish a clear branding procedure around the answers to the following questions:

1. Who is the actual target group of the vaccines? The target group of the vaccines can be considered as threefold: a) the public (=people getting vaccinated), b) the physicians (=people actually vaccinating and recommending vaccines), or c) governments and health system authorities (=authorities deciding on which vaccines should be available in the given country)? The best strategy could be the third: using the already coined public brand names while communicating to the public and using the actual brand names with professionals and governments.

2. Do the companies want to be actively involved in branding? It is uncommon to pass on the branding initiative to the public; as we see, however, it happened in the case of the brand names of vaccines. It is questionable whether the initiative could be transferred back to the companies; they can try, however, at least to some extent, to steer which name is used. The most promising would be to use both names in communication.

3. What marketing efforts (budget, activities, etc.) are needed to try to change the already established public brand names? Creating and coining brand names is a lengthy and expensive process. Changing the vaccine brand names on a worldwide market, where the public brand names are already coined, would require a significant investment and highly targeted communication.

4. What are the benefits and caveats for the use of public brand names and actual brand names for vaccines? As stated above, both names can be used: the use of public brand names connects the company name to the vaccines, which could lead to misunderstandings. On the other hand, the actual brand names do not seem to resonate with the public.

5. Is it beneficial for the company that the public uses the company name for a vaccine? Again, the company has to decide on its strategy. As stated, connecting the company name to the vaccines can lead to misunderstandings. On the other hand, the company names were – and are – frequently mentioned in media, connected to a positive image due to saving lives during the pandemic.

6. Do the actual brand names need to be communicated to the public? Branding without brand names is hardly possible, although other branding elements than brand names – like slogans or logos – are also effective. In the case of consumer products like food or fashion, success is connected to a communicated brand name and effective, owner-led marketing communications (cf. Camiciottoli 2018). In the case of vaccines, however, the decision about which vaccine we use is just partly connected to the brand name: it depends on the available vaccines and is also connected to the information about the efficiency of the vaccine

communicated through media. And we must remember that the vaccines are already branded – by the public brand name, which resonates with the media and the public.

7. Are the actual brand names the best names possible for the vaccines, or is it useful to develop new brand names? "Good" brand names help sell products. As we have seen from the results, the actual brand names are less corresponding to the characteristics of "good" brand names. We also pointed out that the acceptance of the names is at least questionable. Thus, the creation of new names would be recommendable when the brand owners wish to coin the names to the public.

For the time being, it seems that the brand names of vaccines and the use of these names are less influenced by the companies themselves, much more, however, by all the other actors: by the public, and by mass and social media, by governments and to some extent by the specialists using and recommending the vaccines.

Companies need to decide – in a short time – on their respective strategies for vaccine brand names, also bearing in mind that brand names are actual anchors that influence decisions about getting vaccinated (see Evans & French, 2021; Pedroso et al., 2022; also Wänke et al., 2007).

7. Limitations and further research

The present study has limitations: The empirical study was conducted with native Hungarian speakers, who may evaluate brand names differently from native speakers of Indo-European languages. Since, however, the target group of vaccines is not limited to speakers of Indo-European languages, the chosen target group is valid for researching names.

The second limitation is connected to the fact, that the students were business students. The fact is important because the students – connected to their study subject – have marketing and – to a lesser extent – branding knowledge, and they are aware of the importance of brand names. Although the field of study may influence brand knowledge in a given product category (cf. Alimen & Guldem, 2010) and may influence associations (cf. Kovács, 2013), we do not know – and in retrospect, we cannot empirically prove – that general marketing knowledge influenced vaccine brand name knowledge in early 2022.

The third limitation of the empirical study is due to the data collection: although the questionnaire was designed carefully, it is not possible to create a questionnaire evaluating brand names in different contexts without actually naming the brands to evaluate. Thus, every questionnaire asking more than one question connected to a brand name may influence the perception of the name.

Future research directions arise from the limitations: to evaluate vaccine brand names, in subsequent research, native speakers of other languages should also evaluate vaccine brand names in a research design, where from all participants only one question (e.g., name vaccines; rate vaccine names; mention associations to brand names) regarding vaccine brand names is asked. To achieve a more detailed picture of the topic, future research participants should be divided into three groups – participants with marketing/branding knowledge, participants with knowledge in medicine, and laymen in both fields – in order to see how specific knowledge influences the brand name recall and the brand associations of vaccine brand names.

8. Conclusion

Naming products – especially medical products – is a time- and resource-consuming task. However, the efforts are justified: good names can help sell products and can – in the case of vaccines – help save lives.

It has been shown that the name creation for coronavirus vaccines was a quick and uncommon process: the product was already in the market under a public brand name when the actual brand names themselves were introduced. Thus, the actual brand names were overshadowed by the public and widely used brand names of the vaccines. This double effect can also be grabbed by empirical data: in a recall test, public brand names were recalled as brand names of vaccines.

The names of vaccines show that both the brand name and the product are important: without the corresponding product, the name cannot work; and on the contrary, a good product can become successful even with a supposedly "bad" – or from the public invented – name (see Rivkin & Sutherland, 2004; Usunier & Shaner, 2002).

Empirical results and resulting considerations suggest that pharmaceutical companies are well advised to rethink their brand naming strategy for vaccines since – as we see now – vaccines and their names seem to remain with us for years to come.

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