

Ehrenberg-Bass Institute Working Paper:

Are there generalizable patterns in line extension performance?

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Structured Abstract

Purpose – New product introductions, particularly line extensions (LEs), are common in consumer goods categories with no guarantee for success. Despite their commonality, brands that introduce LEs lack benchmarks about what success to expect.

Design/method/approach – This study investigates the success of 36,994 LEs in each quarter for the first three years after introduction. Four indicators are calculated using consumer panel data to benchmark how long LEs survive (failure rate), how competitive they are in the category (market share) and how they are adopted by category buyers (penetration and repeat buyer rate).

Findings – Most LEs survive after the first year but many cease to exist or perform well in the long-term. Around 50% of LEs fail a year after launch but this failure rate halves once seasonal LEs are removed. Failure rates start to approach 80% after three years. Most LEs do not perform better than existing products. Around three in four LEs have a market share or penetration near or below the category norm. Although the percentage decreases the longer after launch, most LEs are still below the category norm.

Practical Implications – Our new product success benchmarks provide guidelines to practitioners about what success the ‘typical’ LE will achieve. This research can help guide new product investment decisions because it provides context on what is feasible to achieve.

Originality – Four market success measures are used, a departure from past benchmarking research which uses practitioner evaluation on metrics seldom used in practice. We provide

guidelines about *when* and *how* to measure LE and new product success more broadly.

Keywords: New product management, new product adoption, product innovation, marketing metrics, brand performance, portfolio management

Paper Type: Research Paper

Introduction

New introductions are common across consumer packaged goods (CPG) brands. The number of new CPG introductions is well into the thousands each year, and it is estimated a new consumer product is launched in the United States (US) every two minutes (Nielsen, 2019). This trend is not slowing and rises with every year (McKinsey & Company, 2020).

The reasons why practitioners decide to launch a new product vary. Generally speaking, brands introduce new products to stay competitive short-term and to stimulate growth long-term. New products can produce substantial economic advantages, demonstrated by the examples of new products with sales well into the millions (e.g., Circana, 2023). Their anticipated financial rewards provide practitioners a strong incentive to launch them, but they require a substantial time and capital commitment, in which the payoff is never guaranteed.

Not all new products will last, even award winners (Victory and Tanusondjaja, 2023), but how many typically fail? An 80% rate is widely accepted but cumulative evidence shows new products fail at half the accepted rate (Castellion and Markham, 2013; Crawford, 1979; 1987). Past research sampling new product projects continually support a 40% rate when using practitioner evaluation (e.g., Knudsen *et al.*, 2023; Markham and Lee, 2013). A similar rate is also seen in purchasing data for new SKUs (e.g., Victory *et al.*, 2021), of which many are from established brands (line extensions). A 40% rate is better than the widely accepted 80%, but this is still a significant risk when it can equate to millions of wasted investment.

Many studies examine how certain conditions (e.g., product innovation, marketing support) increase the likelihood of achieving new product success (Evanschitzky *et al.*, 2012). These studies are often among the most commonly researched in innovation (Page and

Schirr, 2008) but they seldom provide *consistent* insights to apply in practice. This is likely symptomatic of inconsistent or unclear success measures and conceptualisations (Danneels and Kleinschmidt, 2001; Salnikova *et al.*, 2019), or variation in the product types sampled.

These studies, although well researched, will not show us *how* to increase the likelihood of success until we benchmark *what* explicit success is likely and for *which* new product types. Conclusions about how to improve success outcomes will not be possible until we benchmark what is typically achieved using explicit success measures. Although Cooper (1984) noted this limitation 40 years ago, there has been an absence of success benchmarks since.

This study adopts an empirics-first approach (Ehrenberg, 1994; Golder *et al.*, 2023) to benchmark the success of line extensions (LEs) using four measures observed in consumer panel data. LEs warrant investigation due to their commonality and potential advantages and risks associated with leveraging an established brand. The success measures investigated in this study are **(a)** survival/failure rate, **(b)** market share, **(c)** penetration and **(d)** repeat buyer rate. This study evaluates success measures over a longer time horizon (launch to three years).

This research uses consumer panel data to investigate the performance of 36,994 LEs. LEs were identified in five CPG categories, in one of four US regions, over a nine-year period. This study is among the first to benchmark LE success in the short and long-term, using four measures to capture multiple success perspectives, calculated from consumer purchases. The rationale and operationalization of the metrics are explained later.

This study makes two main theoretical contributions to understanding of new product success. First, we capture multiple perspectives to benchmark LE success. We benchmark LE success using observed measures and contrast the results to prior research using subjective practitioner evaluation. We advocate the broader adoption of observed measures to reduce reliance on practitioner surveys, which can be costly and time consuming to obtain.

Second, we show LE market share and penetration begin to converge around one year after launch, highlighting the importance of measuring success for at least the first 12 months of launch. We show market share and penetration have a positively skewed unimodal distribution. These findings help guide sampling and statistical analysis selections in future research. This study establishes foundational knowledge about how LEs perform at launch and in the proceeding years, providing future new product success research a much needed baseline to build clear, repeatable generalizations.

The study has substantial value to marketers and innovation decision makers. First, we confirm the 80% failure rate is not reached in the short term (i.e., after one year). Rather, it takes at least three years after launch and only when all LEs are included (i.e., including seasonal LEs). This helps practitioners to plan the length of marketing support required based on the typical survival timing.

Second, most LEs have a share and penetration near or below the category norm. This implies that ‘successful’ LEs tend to be rare. This helps practitioners to evaluate the likely value of LEs with their forecasts. Our findings provide practitioners with a benchmark for *what* types of success to expect and *when*, and guidance for *which* performance indicators are more important to track.

Background

Why is it challenging to measure success?

New product success is a popular research area, particularly studies exploring the conditions to increase success (e.g., Henard and Szymanski, 2001; Montoya-Weiss and Calantone, 1994). The most recent meta-analysis synthesized results for over 30 conditions (see, Evanschitzky *et al.*, 2012), relating to the product, its strategy, process, the marketplace environment and the organization, for multiple types of new products.

As there are few empirical regularities in success research, disaggregating the various elements of new product success is vital (Lee and Markham, 2016). However, there is no single definition of what constitutes a ‘success’ nor a clear answer about how to measure it. 30 years ago, 80 success measures were identified but not all were used in practice and academia (Griffin and Page, 1993). The study showed revenue-oriented measures were used by both, but failure rate was used more often by academics, while measures like market share and acceptance (penetration) were used more often in practice (Griffin and Page, 1993).

In addition to the variation due to *who* is measuring success, the variation in how to conceptualize and measure success also depends on *what* type of the new product is being sampled and its objectives (Griffin and Page, 1996), *when* success is being measured (Hultink and Robben, 1995), and *which* data is available to measure it (Crawford, 1979).

How is success typically measured?

Practitioners often use multiple metrics to measure success (Booz-Allen & Hamilton Inc., 1982; Cooper *et al.*, 2004; Mintz and Currim, 2013). Academics typically navigate this

complexity by measuring success through practitioner evaluation (e.g., Knudsen *et al.*, 2023), leading to the widespread use of subjective and quasi-objective measures. Examples of these include asking practitioners about the percentage of new products they considered successful by the company (subjective) and recall their contribution to company sales (quasi-objective).

Accordingly, many studies leverage practitioner knowledge to subjectively evaluate success (e.g., Barczak *et al.*, 2009; Cooper *et al.*, 2004; Cooper and Kleinschmidt, 1995; Griffin, 1997; Hultink *et al.*, 1997; Hultink *et al.*, 1998; Hultink *et al.*, 2000; Knudsen *et al.*, 2023; Markham and Lee, 2013; Page, 1993). These studies typically sample new products projects/lines, not single items, making them closer to new brands/sub-brands with multiple items together (Victory *et al.*, 2021).

Leveraging practitioner knowledge can capture nuances in success. For example, a new product might not have sold well but it might have achieved another goal like improving retailer relationships, which could only be known by asking practitioners. While practitioner evaluation can provide additional insight and context, this approach is prone to bias (Nijssen, 1999) and does not explain the explicit criteria or indicators used to evaluate success.

A recent movement has championed the use of observed measures to evaluate new product success (e.g., Salnikova *et al.*, 2019; Victory *et al.*, 2021). Research using observed measures like survival tell us how long new products last, but it does not tell us how they performed while in the market. It is thus important to explore not only the chance of failure but also the expected ‘return’ from new products. This is only possible when evaluating new products using explicit success measurement, like market share, penetration, and loyalty.

Measures like market share, penetration and repeat rate are vital to evaluate a brand's performance (Ehrenberg et al., 2004), due to the relationship of penetration and loyalty in market share (Ehrenberg *et al.*, 1990; Graham *et al.*, 2017). New brands typically exhibit a similar pattern to established (small) brands soon after launch (Ehrenberg and Goodhardt, 2000). This pattern suggests market share, penetration and loyalty might be valuable to investigate for other introductions. However, there is a lack of understanding about what performance to expect on these metrics, even for the most common introduction type: LEs.

Why do brands introduce line extensions?

Most new CPG products are introduced under an established brand name (Kovalenko *et al.*, 2022). This can include introducing a product using an established brand in a category the brand operates in (line extension) or in a category the established brand does not operate in (brand extension). Brands can do both. As an example, Cadbury Dairy Milk (brand) often has new flavors of chocolate (line extension) but they also sell ice cream (brand extension).

Marketers might choose to leverage an existing brand to reduce costs and minimize risk. Extensions are assumed to reduce risk because they 'borrow' the brand's market-based assets (see, Sharp *et al.*, 2023), including the brand's established distribution channels, and existing associations in consumer memory, like quality and familiarity (Aaker and Keller, 1990; Pitta and Katsanis, 1995). Given these benefits, it is unsurprising extensions are more often evaluated as 'successful' by practitioners (Garrido-Rubio and Polo-Redondo, 2005).

What is a 'successful' line extension?

Many brand extension studies use student samples, hypothetical extensions and measure evaluations not market performance (e.g., Aaker and Keller, 1990; Keller and Aaker,

1992; Sunde and Brodie, 1993; Bottomley and Doyle, 1996). A study suggests these results can be generalized to consumers, real brands, and behavioral intentions (Völckner and Sattler, 2007). This tackles the respondent and product sample limitations, but intentions are not akin to future behavior (Sun and Morwitz, 2010; Romaniuk *et al.*, 2011; Nguyen *et al.*, 2022), making it important to understand performance using in-market success measures.

The value of extensions is further supported in market-based success measures by research suggesting extended brands in multiple categories often have a higher market share and a greater likelihood of cross-purchase (e.g., Smith and Park, 1992; Grasby *et al.*, 2022). Although drawing upon the brand's existing buyer-base might be a desired outcome when launching products using an established brand in a new category (brand extension), this is not desired with a new product using an established brand in the same category (line extension).

There are advantages in leveraging established brands but line extensions (LEs) carry some risks because they enter an established structure and can cannibalize (Lomax *et al.*, 1996; Lomax and McWilliam, 2001). As an example, top selling products attract around half of a brand's buyers (Tanusondjaja *et al.*, 2018), yet most new variant buyers are heavier parent brand buyers (Trinh *et al.*, 2016). Although LEs have a greater chance of being trialed by category buyers with more experience with the parent brand, it does not equate to higher repeat purchases of the LE long term (Kim and Sullivan, 1998; Swaminathan *et al.*, 2001).

Altogether, LEs compete with products from competing brands and (cannibalize) other products within their portfolio. This cannibalization risk is even greater for LEs with similar features to the brand's products (Sezen *et al.*, 2023). While there are advantages in

introducing new products using an established brand, it is vital to benchmark whether the likely success and performance of LEs are worth the possible risks.

Research Questions

As discussed above, the lack of clarity about how LEs perform (most common new product type) on explicit sales metrics and guidelines about how their success should be evaluated, necessitates the need for further research. It is important to systematically benchmark how LEs perform because, without this, it will be hard to establish a generalized relationship between marketing decisions and success.

To address this issue, we document LE success using survival and describe their performance using the three indicators of market share, penetration, and repeat rate. We evaluate LEs performance using multiple metrics over time (beyond launch year), to provide marketers an understanding about what success expectations are reasonable when launching LEs. Large-scale consumer panel data is used to identify and evaluate the success of LEs used in this research.

To inform decision making and build a foundational understanding of success, we document how many LEs are successful using a technique to objectively measure ongoing success (i.e., survival length). We also examine LE performance on three indicators used in practice to describe adoption. This study answers the following:

RQ1: *Failure rate* – How many LEs survive in the short and long-term?

RQ2: *Market share* – How competitive are LEs in the short and long-term?

RQ3: *Penetration* – How are LEs trialed in the short and long-term?

RQ4: *Repeat buyer rate* – How are LEs adopted in the short and long-term?

This research builds a greater understanding of what performance to expect for the most common type of new product: LEs. This study provides a framework for practitioners and academics to improve the measurement selection, timing and evaluation of success. A full explanation and rationale for these success measures is discussed next.

Data and Method

Data

This study investigates the performance of LEs using multiple success perspectives. To identify LEs and benchmark success, we use NielsenIQ Consumer Panel Data from the Kilts Center for Marketing (2024). The NielsenIQ Consumer Panel Data has purchasing information for around 1.4 million items in over 1,000 CPG categories, for 40,000 to 60,000 households (Kilts Center for Marketing, 2024). This dataset is gaining popularity in recent research (e.g., Driesener *et al.*, 2022; Dunn *et al.*, 2021; Koschmann and Sheth, 2018).

There are potential limitations in scope, however we deem this database appropriate to answering the research questions. For example, the data does not include online purchases but offline sales represent around 95% of CPG sales in the US (Clapp, 2021). Furthermore, the scope of CPG purchasing is deemed appropriate for our purpose as new products in CPG categories are higher risk than in other industries (Lee and Markham, 2016). Given their potential economic impact, efforts to reduce this risk are warranted.

The regional (not national) performance of LEs were investigated because not all products in the US are launched nationally (Hoskins *et al.*, 2020). LE success in four cities

was examined to ensure local performance was not undervalued compared to national launches. For example, national launches might appear to have ‘high sales’ but they simply had more category buyers to draw upon. The selected regions are the four most populated US cities (United States Census Bureau, 2015). We examined success within regions but there were no substantial differences across regions. The overall results are presented below.

The sample amounted to 36,994 LEs in five categories (Cookies, Ground/Whole Bean Coffee, Ready to Eat Cereal, Toothpaste, Spray Air Fresheners) over nine years (2005-2013), in four cities (New York, NY; Chicago, IL; Los Angeles, CA; Houston, TX). The diversity in the categories (food, drink, personal care and household products), years, and regions help evaluate the generalizability of the benchmarks and test possible boundary conditions.

New product definition and identification

LEs are investigated at the Universal Product Code (UPC) level. This is because each UPC requires a conscious decision by brands to manufacture and allocate resources to the product, as well as a decision from retailers to stock and allocate space for it in their stores.

Brands can introduce many types of new products, ranging from new-to-the-world products (very different to what has come before) to modifications of existing products (Booz-Allen & Hamilton Inc., 1982). Each new product type varies in how different it is, its purpose, and prevalence in the industry. We focus on LEs to control for any performance differences due to variability in strategy and support provided.

LEs are new products that supplement the product portfolios of established brands in the same category (Reddy *et al.*, 1994; Sezen *et al.*, 2023; Tauber, 1981). Product additions

and revisions are the most common introduction type in CPGs (Booz-Allen & Hamilton Inc., 1982; Hultink *et al.*, 2000). Not only are they common, a systematic investigation into LEs is required because although there are many potential advantages in leveraging an established brand (discussed above), failed LEs have the potential to damage the parent.

We manually identified all 36,994 LEs in the data as there is no explicit indicator for new products in the dataset. We define LEs as a UPC introduced under an established brand, that was not bought in a previous period, but that was purchased at least once in a subsequent period. A minimum one calendar year is used to establish purchase history (Sinapuelas *et al.*, 2015). This approach is used in past research (e.g., Abril and Sanchez, 2016; Hoskins *et al.*, 2020; Hoskins and Griffin, 2019; Sinapuelas and Sisodiya, 2010; Victory *et al.*, 2021).

New product success measurement

We investigate LE performance using four metrics: **a)** Failure rate (survival), **b)** market share, **c)** penetration, **d)** repeat buyer rate. The measure of failure and the three performance indicators describe whether the LE **(a)** continued to meet its objectives, **(b)** its competitiveness relative to other products, and **(c)** how category buyers adopt and **(d)** repurchase it. The measures are not provided in the database and are calculated using the self-report purchasing information from the consumer panel dataset. The rationale and calculation for the measures are described below and summarised in Supplementary Table I.

Failure rate: Failure rate is typically measured using practitioner evaluation (e.g., Markham and Lee, 2013). This is not a standard criterion to evaluate what constitutes a ‘success’, and it relies on accurate recall. We adopt a consistent approach to measure success across all LEs. Failure is the percentage of LEs that are no longer bought (Goldenberg *et al.*,

2001; Victory *et al.*, 2021; Wilbur and Farris, 2014). We look forward up to three years after launch to identify the quarter in which each LE ceased regional sales. This is used to calculate how many LEs no longer survived, out of all LEs, from launch to three years later.

Market share: Market share is used in practice to evaluate new product performance (Griffin and Page, 1996; Mintz and Currim, 2013; Nijssen, 1999; Page, 1993). We examined revenue and unit share and found a very high level of similarity. As such, we present revenue share for simplicity and because it ties with new products often being launched at higher prices (Europanel, 2023; Garrido-Rubio and Polo-Redondo, 2005). Market share is calculated as the percentage of the LE's cumulative regional sales, relative to the cumulative quarterly regional category sales.

Penetration: Penetration is key in evaluating brand performance (Ehrenberg *et al.*, 2004) and it is also used by marketers to evaluate new products (Mintz and Currim, 2013). Penetration is important to measure LE success (Guiltinan, 1999) because this product type often has the goal to target the masses and increase brand penetration (Hultink *et al.*, 1998; Hultink *et al.*, 2000). Penetration is the percentage of households buying the LE at least once in the region, relative to the number of category buying households in the region.

Repeat buyer rate: Penetration only shows us how many category buyers purchase the product at least once and does not illustrate how buyers are adopting it into their repertoires. High repeat rates are rare. Repeat rates for extensions have been investigated in past research (e.g., Singh *et al.*, 2012). This study measures repeat buyer rate as the percentage of category buying households in the region who had purchased the LE at least once since its launch.

This study investigates LE performance over the first three years after introduction. This is a longer description of success than the commonly investigated 52-week period (e.g., Hoskins and Griffin, 2019; Sinapuelas *et al.*, 2015). The 52-week period is oft-cited as being an ‘acceptable’ window to measure new product performance because it is said consumer acceptance occurs within six to 12 months (e.g., Gielens and Steenkamp, 2007) but no evidence is provided. We examine success over this longer period to establish if the 52-week period is a satisfactory timeframe to capture the consumer acceptance window.

The performance of each LE is measured in each quarter over its first three years (12th quarter) third year after launch. This paper comments on the results in the quarter after launch rather than the initial launch quarter to exclude transient LEs which were not intended to remain in the market longer-term (i.e., seasonal Christmas flavors). The launch quarter results are not shown because the LEs could be introduced at any time during that quarter and may struggle to ‘build up’ distribution and awareness in that time (Singh *et al.*, 2012).

Method

We aim to identify empirical generalizations in LE success. Empirical generalizations are law-like, repeated relationships observed across conditions (Bass, 1995; Ehrenberg, 1995; Uncles and Wright, 2004). We use an empirical-then-theoretical approach (Ehrenberg, 1994) because this study has practical significance, we use a novel dataset, and prior coverage is mixed (Golder *et al.*, 2023). Research aiming to discover law-like patterns is not required to be preceded by clear theory (Bass, 1995; Ehrenberg, 1995). This study uses Many Sets of Data (i.e., multiple categories, years and regions) to identify repeatable patterns in LE success.

This study spots performance patterns in descriptive analyses to identify ‘significant sameness’ across categories (Bound and Ehrenberg, 1989). We demonstrate ‘elaborate statistical techniques are [not] required to uncover lawlike relationships’ (Ehrenberg, 1969, p.15). The analyses we conduct are as follows. First, we report the mean performance for the ‘typical’ LE in each category. We then compare how ‘typical’ this is by examining the distribution in LE performance. As the distributions across categories were similar, one example for each performance indicator is in the Online Appendix. Finally, we examine how far above or below each LE’s performance is compared to the category norm, to provide a relative measure of how different LEs are compared to all competing products.

Results

Failure rate

The highest percentage of quarterly failures happens in the first quarter after launch (M=32%, SD=5). Half of all LEs are removed from the market within the first year after launch (SD=6). As shown in Supplementary Table 1I, LE failure continues to increase in each quarter to 64% within the two years (SD=6), reaching the famed 80% failure rate during the 12th quarter after launch (SD=6). This demonstrates an 80% failure rate does exist for LEs but rates nearing this only happen three years after launch.

As the highest percentage of quarterly failures occurs in the first quarter after launch, it could be the case that many of these ‘failures’ were LEs that were not intended to be in the market for a long period (e.g., temporary/seasonal LEs). NielsenIQ Consumer Panel Data, at the time of this study, does not have an indicator that pre-identifies seasonal products. To obtain a more realistic view on failure, LEs that did not make it past the initial launch quarter were removed from the calculation.

After removing the seasonal/transient LEs (see Table I), the failure rate decreases to one in four LEs within the first year after launch ($M=23\%$, $SD=5$). This is around half the rate when all LEs are included. The failure rate among the non-seasonal LEs increases to 47% within the second year ($SD=7$) and up to 70% ($SD=7$) in the third year after launch. Although failure is still higher than practitioner evaluations, the rates are certainly lower in each quarter after excluding seasonal LEs. Illustrating the reduction in failure when seasonal LEs are excluded is important to practitioners to understand the *actual* risk. This answers RQ1.

<INSERT TABLE I>

Market share

Next, we investigate the LE market share expectations in each quarter from launch. Table II presents the mean market share achieved by the ‘average’ LE in each category. The ‘average’ LE has a share of around 0.3% ($SD=0.2$) in the quarter after launch. The ‘average’ market share achieved by LEs is about 0.3% each quarter, which suggests the average LE has low share but it does not provide an understanding if this is representative of the ‘typical’ LE.

<INSERT TABLE II>

The distribution of LE market share was investigated to understand how often LEs achieve the average 0.3% market share. LE market share has a unimodal and positive skew in all categories and time periods investigated (see Supplementary Figure I). The distributions demonstrate most LEs have a market share closer to zero but there is a long tail. In other words, strong market share performance is possible, but most LEs do not achieve this.

Interestingly, when comparing the market shares achieved by LEs relative to the average market share achieved by all products across the categories, 72% of LEs had a market share below the category norm in the quarter after launch ($SD=3$). The percentage of LEs with a lower market share than the category norm decreased to around two in three LEs three years on ($M=66\%$, $SD=8$). Table III demonstrates a very small number of LEs account for a very large percentage of the ‘average’ market share achieved by LEs. This also shows LEs typically do not do better than established products, which can help temper expectations. Altogether, this addresses RQ2.

<INSERT TABLE III>

Penetration

We then investigate how LEs are trialed by category buyers. Table IV shows the ‘average’ LE has a penetration of 0.5% in the quarter after launch ($SD=0.2$). One year on, LEs have a mean penetration of around 0.6% ($SD=0.2$). The 0.6% share continues to persist in the second and third year after launch ($SD=0.3$). The stability in penetration after the first year provides supporting evidence about the importance of the first 52-weeks to customer acceptance. It also suggests LEs may not be a mechanism to dramatically increase a brand’s overall penetration and instead imply they mainly play a defensive role in the brand’s portfolio to keep up with the competition.

<INSERT TABLE IV>

The ‘average’ LE penetration results discussed above are not representative of what the ‘typical’ LE achieves. The penetration LEs have follow a unimodal distribution with a positive skew, in each period after introduction (see Supplementary Figure II). Across the categories, the vast majority of LEs have a penetration of less than 0.5% in the quarter after

launch and in each quarter up to the three years after launch. This suggests most LEs fail to reach a vast majority of category buyers.

Finally, we compare the penetration LEs receive relative to other products they compete against in the category. Table V shows the percentage of LEs with a penetration below the category mean. Three in four LEs have a penetration below the category norm in the quarter after launch (M=74%, SD=2). LEs with a below average penetration decreases in the third year after launch, to around two in three LEs (M=67%, SD=6). This illustrates LEs are typically not bought widely by category buyers, answering RQ3. This suggests LEs either fail to be thought of and bought by category buyers, or perhaps they are designed to appeal to a smaller group of category buyers.

<INSERT TABLE V>

Repeat buyer rate

To provide more context about how category buyers adopt LEs, Table VI details the ‘average’ mean repeat buyer rate for LEs. Across the five categories the ‘average’ LE has a mean rate of around 20% in the quarter after launch. This means 20% of those who bought the LE upon launch purchased it again the next quarter (i.e., 80% ‘new’ buyers). The number of repeat buyers the ‘average’ LE accumulates intuitively increases overtime, peaking at 38% (SD=7) three years after launch. While the rate increases as the longer LE is in the market, this shows most category buyers who buy LEs, even years on, had not bought it before.

However, there is a large spread in the repeat each LE receives in each quarter after launch. Supplementary Figure III illustrates the bimodal distribution with peaks between zero and 10%, and 90-100%. The peaks may be due to some LEs having small buyer bases (i.e., few buyers who all do/do not repurchase). All categories had a similar distribution. This

suggests LEs can stick in category buyer repertoires but even survivors need to acquire new buyers. This answers RQ4 and begins to question the role of trial and loyalty.

<INSERT TABLE VI>

Discussion

Around a third of LEs fail in the first quarter after launch, 50% fail in the year after launch and this continues to increase reaching 80% three years after launch. Although the final failure rate in this research is widely believed in industry, it is seldom seen in past research investigating new product projects (see, Castellion and Markham, 2013). Although an 80% rate does exist for LEs, it is important to remember it takes three years (12th quarters) after launch to reach this rate. This finding underscores the concept that success (or failure) rates for new products depend highly on the period considered. The importance of timing is not a new concept (e.g., Hultink and Robben, 1995), but we re-emphasize the importance of timing measurement in new product success research.

Interestingly, the failure rates halve after the first year and are much lower in the second year once the seasonal LEs are removed. After excluding seasonal LEs, the rates after a year complement past research measuring survival in sales data (e.g., Wilbur and Farris, 2014) and failure rates in industry reports (e.g., Europanel, 2023). Our findings suggest the measurement context and product sample are vital when interpreting failure rates. The need for explicit success conceptualizations is still recognized (Varadarajan, 2024).

Our second year failure rate is slightly higher than in studies using a sample of new products from established (LE) and new brands (Victory *et al.*, 2021). This could suggest LEs might not offer a higher likelihood of success. Although extensions are typically employed to

reduce the risk through the parent brand, it does not appear they actually achieve this. All together, a central contribution of this research is the recognition of the conditions that are important to consider in success measurement include aspects like the type of new product sampled, data used, measurement approach and timing.

The results of this research also suggest many LEs have low performance and perform below the norm in their category. The relatively low market shares and penetration call into question the idea of investing in LEs and banking on them to bolster a brand's sales and grow the customer base. On aggregate, LE mean market share and penetration are more stable after the first year. Their somewhat stable mean performance over time shown here provides some support to the belief in past studies about the importance of gaining consumer acceptance in the first 52-weeks after their introduction (e.g., Gielens and Steenkamp, 2007).

The 'average' success LEs can achieve hides the variation of what the 'typical' LE achieves. For example, the share and penetration most LEs achieve are below the average of all other products in the category. However, the distributions have a long tail, suggesting some LEs *can* bolster sales and attract buyers but many do not do this. This is not to say brands should avoid introducing LEs but rather should LEs be part of the brand's long-term strategy, it is important to consider if their likely performance will measure up to the intended objectives. The variation in performance around the category norm has been acknowledged in a study investigating cigarettes (Reddy *et al.*, 1994).

Finally, we find there is little evidence that LEs find 'their' buyers who continue to purchase them time and time again. Although repeat buyer rates do increase the longer a LEs survives in the market, not all longer surviving LEs have higher repeat rates. The relatively

low repeat buyer rates begin to suggest LEs should prioritize building trial, not attracting and retaining a smaller and more ‘loyal’ buyer group. This is a similar pattern to how penetration and loyalty vary by brand size (e.g., Ehrenberg *et al.*, 1990). Although this is the initial interpretation, more research is required to compare the role of these metrics in survival.

Implications

For marketing practitioners

Understanding the conditions when new products are more or less successful is a valuable and highly researched area (Lee and Markham, 2016). However, it will not be possible to conclude clear relationships from these studies until benchmarks are established about how new products perform on explicit success indicators. This limitation was identified in the 1980s (e.g., Cooper, 1984) and continues to be argued today (e.g., Victory *et al.*, 2021). This study builds a foundational understanding of what performance to expect from LEs.

This study concludes most non-seasonal LEs survival in the short term (i.e., 77% reached the first year after launch), but most have a market share and penetration below the average in their category. It seems then that few LEs could be deemed truly ‘successful’. As failure still occurs and most have a low share, this suggests leveraging an established brand does not guarantee positive new product outcomes. These findings help manage practitioner expectations about what performance to reasonably expect from LEs. This is central to practitioners who plan and allocate resources to products in the innovation pipeline.

Our study provides practitioners involved in launching products with a benchmark for LE performance. Although more studies are evaluating success using purchasing data, much of the current knowledge was developed using surveys and subjective evaluations (e.g.,

Knudsen *et al.*, 2023; Markham and Lee, 2013). Practitioner evaluations provide context that cannot be ‘seen’ in market data but it does not aid practitioners in understanding the metrics they should use to measure success or to develop benchmarks to use in the boardroom. We encourage marketers to take these measures and apply them to their own categories.

The findings about the acceptance ‘window’ can help practitioners to judge the future success of a LE. It suggests poorly performing LEs over their first year (assuming they remain in the market) are unlikely to improve substantially overtime. Although more research is required to explore this assertion, this paper is an important first step to guide businesses grappling with the question to either discontinue or continue supporting a product that has not performed well over launch.

For academic research

Given the prevalence of subjective measurement in past research (which can be costly and time consuming to gather), it is also our hope this study will encourage academics to use industry relevant data to measure success and continue to advance our discipline. This will aid in the fight against some industry ‘blackbox’ studies and recommendations. Academics that prioritize research connected to practice can provide the much needed rigor to this area.

We show mean market share and penetration results are largely stable over time, but the distributions reveal this is misleading and does not show the spread of what LEs achieve. This highlights the value in understanding performance distributions to inform sampling decisions. This suggests past research which excludes introductions with a market share below 0.5% is already likely investigating the ‘more successful’ launches in the category.

The market share and penetration distributions presented in this research also guide researchers on which statistical analyses are more appropriate to use. For example, the market share and penetrations explored in this paper had a highly positive skew and many had near-zero counts. Models such as the zero-inflation Poisson / NBD regression (see, Chapter 11 in Greene, 2011) would be likely candidates for modelling such data with this distribution.

This study's most substantial contribution is that it describes *when* to measure new product success and identifies *how* new product success is distributed. We show market share and penetration steadies one year after launch, providing evidence that a LE's first year is important in consumer acceptance. A one-year window has widely been adopted in past research (e.g., Gielens and Steenkamp, 2007; Sinapuelas *et al.*, 2015) but it has seldom been studied. Using behavioral data, we confirm the importance of the first year for acceptance.

Limitations and Future Research

There is substantial variation in performance but the market share and penetration LEs achieve are typically below the category average. We show initial evidence that longer surviving LEs have a slightly higher market share, penetration and loyalty than those who fail sooner (shown by the 12th quarter performance), however, a more systematic investigation is needed to examine the performance trajectory of longer surviving and ultimately failed LEs.

We encourage future research to examine if longer surviving LEs (higher likelihood of being evaluated as 'successful') have superior performance over launch. Answering this would help practitioners to identify 'winners' based on their early performance and decide to either save resources by not continuing to support LEs that are not showing early potential to

succeed or help identify which LEs might need additional support to keep them on shelves. This has been investigated for brand extensions (e.g., Singh *et al.*, 2012) but not for LEs.

This current study investigated LEs introduced by established manufacturer brands. However, it is not well known how success can vary for LEs introduced by store brands, or by higher or lower market share brands, established brands growing or declining in share, or by completely new brands to the market. Each condition mentioned above has the potential to influence the success and potential marketing support available to allocate to new products.

This leads our last suggestion to investigate if some brands have a better chance of achieving LE success. There is evidence that new products from store brands fail more often (Salnikova *et al.*, 2020), but higher share brands have fewer failures (Victory *et al.*, 2021) and greater trial and repurchase (Sinapuelas *et al.*, 2015). Delving into the interplay between LEs and their parents will help practitioners select which brands in their portfolio present a better option to introduce new products and the role of LEs in their parent brand portfolio.

Note

Researcher(s) own analyses calculated (or derived) based in part on data from Nielsen Consumer LLC and marketing databases provided through the NielsenIQ Datasets at the Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business. The conclusions drawn from the NielsenIQ data are those of the researcher(s) and do not reflect the views of NielsenIQ. NielsenIQ is not responsible for, had no role in, and was not involved in analysing and preparing the results reported herein.

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Table and Figures

Table I Line extension failure rate excluding seasonal launches (Q1 failures)

	N	LINE EXTENSION FAILURE RATE EXCL. Q1 FAILURES - %											
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
COOKIES	10856	0	11	17	20	28	38	43	47	54	60	66	74
COFFEE	4127	0	7	12	16	20	28	33	37	43	49	55	64
CEREAL	4037	0	10	18	22	26	33	38	42	46	51	56	62
TOOTHPASTE	3326	0	16	26	30	38	46	50	54	58	62	67	74
AIR FRESH.	2200	0	16	25	26	31	45	49	53	58	64	69	77
MEAN	24546	0	12	20	23	29	38	43	47	52	57	63	70
STD DEV	3413	0	4	6	5	7	8	7	7	7	7	7	7

Once the immediate failures (likely seasonal) line extensions are excluded, the failure rate one year from launch decreases by half. However, it still reaches 70% by the third year.

Source: Authors' own work

Table II Line extension mean revenue market share

	N	LINE EXTENSION MEAN REVENUE MARKET SHARE - %						
		Q1	Q2	Q3	Y1	Y2	Y3	
COOKIES	17263	0.1	0.1	0.1	0.1	0.1	0.1	
COFFEE	5998	0.2	0.2	0.2	0.2	0.2	0.2	
CEREAL	5372	0.1	0.2	0.2	0.2	0.2	0.2	
TOOTHPASTE	5039	0.3	0.3	0.3	0.3	0.3	0.3	
AIR FRESH.	3322	0.6	0.6	0.6	0.6	0.6	0.7	
MEAN	36994	0.3	0.3	0.3	0.3	0.3	0.3	
STD DEV	5603	0.2	0.2	0.2	0.2	0.2	0.2	

In the quarter directly after launch, the 'average' line extension achieves a relative market share (compared to all products bought at least once) of approximately 0.3%.

Source: Authors' own work

Table III Line extension revenue market share below category mean

	N	LINE EXTENSION REVENUE MARKET SHARE BELOW CATEGORY MEAN - %						
		Q1	Q2	Q3	Q4	Q8	Q12	
COOKIES	17263	75	75	75	74	76	76	
COFFEE	5998	71	69	68	66	66	66	
CEREAL	5372	72	69	67	67	63	61	
TOOTHPASTE	5039	75	73	70	71	73	71	
AIR FRESH.	3322	67	68	66	61	60	56	
MEAN	36994	72	71	69	68	68	66	
STD DEV	5603	3	3	4	5	7	8	

Majority of line extensions have a market share below the 'average' market share of all products in the category. Around 66% of line extensions are still below three years on.

Source: Authors' own work

Table IV Line extension mean penetration

	N	LINE EXTENSION MEAN PENETRATION - %					
		Q1	Q2	Q3	Y1	Y2	Y3
COOKIES	17263	0.3	0.3	0.3	0.3	0.3	0.3
COFFEE	5998	0.4	0.4	0.5	0.5	0.5	0.4
CEREAL	5372	0.6	0.6	0.7	0.7	0.8	0.8
TOOTHPASTE	5039	0.4	0.4	0.4	0.4	0.4	0.4
AIR FRESH.	3322	0.8	0.9	0.9	1.0	0.9	1.1
MEAN	36994	0.5	0.5	0.6	0.6	0.6	0.6
STD DEV	5603	0.2	0.2	0.2	0.3	0.3	0.3

The 'average' line extension has a penetration of around 0.5% in each quarter over the first year. This suggests line extensions do struggle to gain trial more broadly.

Source: Authors' own work

Table V Line extension mean penetration below category mean

	N	LINE EXTENSION PENETRATION BELOW CATEGORY MEAN - %					
		Q1	Q2	Q3	Q4	Q8	Q12
COOKIES	17263	74	73	73	73	74	75
COFFEE	5998	75	72	70	68	67	67
CEREAL	5372	72	69	67	66	63	62
TOOTHPASTE	5039	77	76	74	71	71	70
AIR FRESH.	3322	73	68	70	64	64	59
MEAN	36994	74	72	71	68	68	67
STD DEV	5603	2	3	3	4	5	6

Mirroring the market share results, around three in four line extensions have a penetration that is below the average of all products, in the quarter after launch.

Source: Authors' own work

Table VI Line extension mean repeat buyer rate

	N	LINE EXTENSION MEAN REPEAT BUYER RATE - %					
		Q1	Q2	Q3	Q4	Q8	Q12
COOKIES	17263	23	25	29	26	29	32
COFFEE	5998	28	32	35	36	44	47
CEREAL	5372	20	27	33	33	42	44
TOOTHPASTE	5039	12	18	22	22	32	35
AIR FRESH.	3322	13	18	19	22	28	35
MEAN	36994	19	24	28	28	35	38
STD DEV	5603	7	6	7	7	7	7

In the quarter directly after launch, around 19% of the 'average' line extension's buyers bought the product at launch. Three years on, almost 60% of buyers still had not bought it.

Source: Authors' own work

Supplementary Online Appendix

Supplementary Table I Line extension success measures used in current study

MEASURE	DESCRIPTION
Failure rate	Number of launched line extensions that do not have any recorded sales in the quarter or beyond (up to 12 quarters post launch), divided by the total number of line extensions introduced into the market (see, Wilbur and Farris, 2014; Salnikova <i>et al.</i> , 2019; Victory <i>et al.</i> , 2021).
Market share	The cumulative sales of the launched line extension in the quarter, divided by the cumulative sales of all products in the category available in quarter (see, Ehrenberg <i>et al.</i> , 2004; Farris <i>et al.</i> , 2010).
Penetration	The cumulative number of households who purchased the line extension at least once in the quarter, divided by the cumulative number of households who bought the category in the quarter (see, Goodhardt <i>et al.</i> , 1984; Ehrenberg, 1988; Ehrenberg <i>et al.</i> , 2004; Farris <i>et al.</i> , 2010; Sinapuelas <i>et al.</i> , 2015).
Repeat buyer rate	The cumulative number of households who purchased the line extension at least once in any previous quarter since launch, divided by the cumulative number of households who bought the line extension in the quarter (Singh <i>et al.</i> , 2012).

This study measures line extension success using four performance metrics. Market share and penetration are among the most important metrics used to evaluate brand performance.

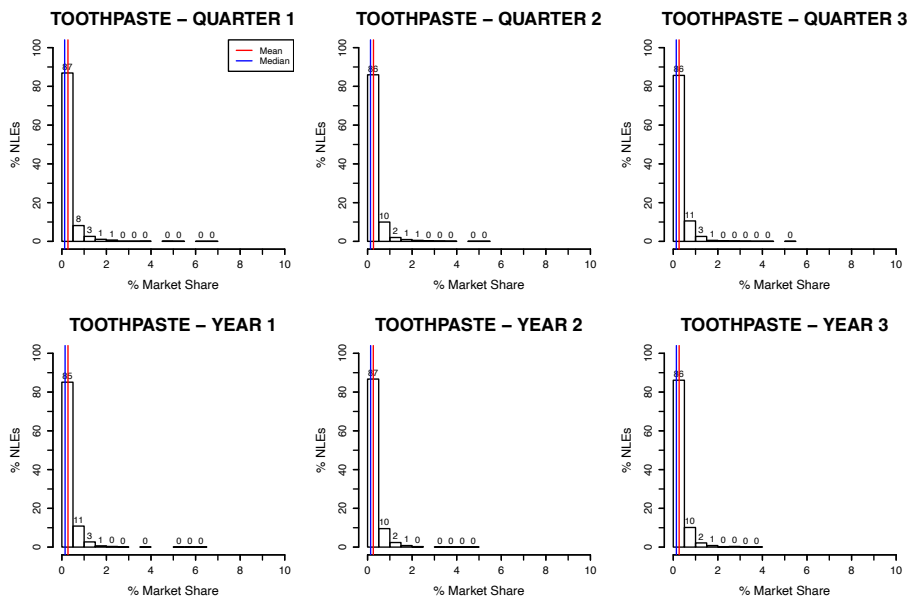
Source: Authors' own work

Supplementary Table II Line extension failure rate

	N	LINE EXTENSION FAILURE RATE - %											
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
COOKIES	17263	37	44	48	52	57	61	64	67	71	75	79	84
COFFEE	5998	31	36	40	43	47	51	54	57	61	65	69	75
CEREAL	5372	25	33	38	43	47	50	54	57	60	63	67	72
TOOTHPASTE	5039	34	44	51	56	61	64	67	69	72	75	78	83
AIR FRESH.	3322	34	44	50	55	59	63	66	69	72	76	80	84
MEAN	36994	32	40	45	50	54	58	61	64	67	71	75	80
STD DEV	5603	5	5	6	6	7	7	6	6	6	6	6	6

Around one third of line extensions fail in the quarter directly after launch. This increases to half by the first year, two in three by the second year and reaches 80% three years on.

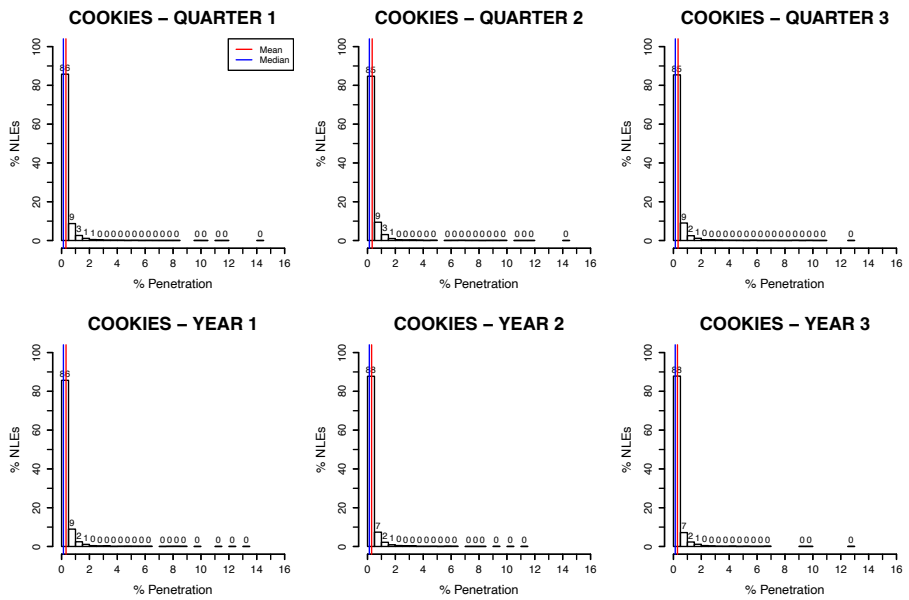
Source: Authors' own work



Supplementary Figure I Line extension sales revenue market share distribution

Line extensions vary greatly in their market share over each key quarter. While most (>80%) line extensions have a market share below 0.5%, there is spread in the data.

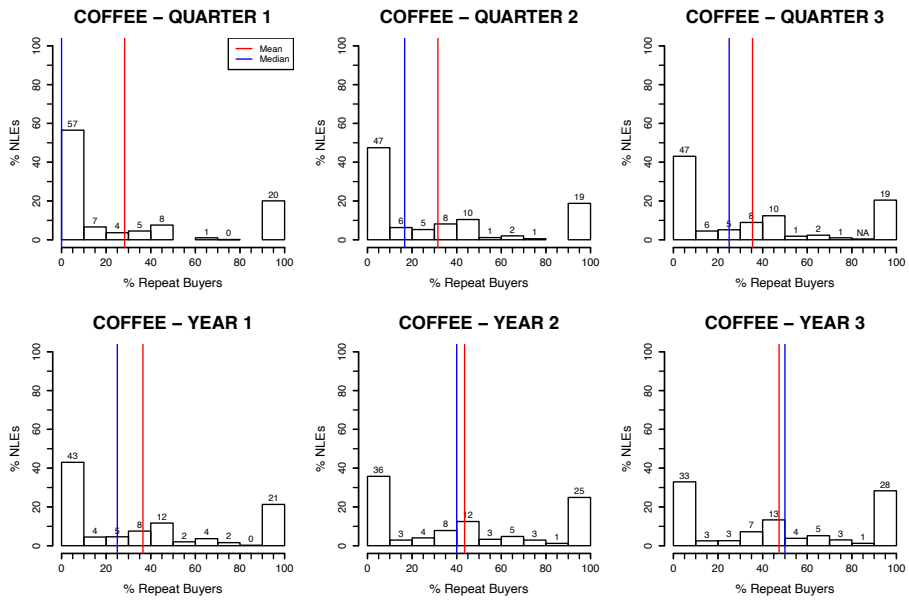
Source: Authors' own work



Supplementary Figure II Line extension penetration distribution

It is common for line extensions to achieve a penetration below 0.5% but there are some line extensions that do gain much higher penetration in each key quarter.

Source: Authors' own work



Supplementary Figure III Line extension repeat buyer rate distribution

As line extensions are in the market for longer, the number of people who repurchase the introduction increases. Note, some peaks may be due to LEs having small buyer bases.

Source: Authors' own work