This is the peer reviewed author accepted manuscript (post print) version of a published work that appeared in final form in:

> Victory, Kirsten, Nenycz-Thiel, Magda, Dawes, John, Tanusondjaja, Arry & Corsi, Armando Maria 2021 'How common is new product failure and when does it vary?', *Marketing Letters* online, pp. 1-16.

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How common is new product failure and when does it vary?

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Abstract

This study aims to explore how common new product failure is in consumer packaged goods (CPG) categories and investigate the conditions in which the new product failure rate varies. This study analyses 83,719 new Stock Keeping Units (SKUs), which were introduced over eight years (2002–2009) across 31 CPG categories in the United States. Failure is the permanent cessation of sales, which is measured in consumer panel data. We find that one in four (25%) new SKUs are no longer bought one year later—a rate that increases to approximately 40% two years' post-launch. New SKU failure was more likely for new launches that were introduced into higher revenue categories and by smaller share parent brands. Our findings can be used as a resource to aid marketing practitioners' understanding regarding how common failure is for new CPGs and when there is greater associated risk.

Keywords: New products, new product failure, benchmarking, consumer packaged goods

1 Introduction

New product development is an important strategic activity for organizations. New products can be used to achieve profit and margin goals, increase or protect the market share in existing markets and categories, and extend established brands into new categories and markets (Edgett et al. 1992; Pellegrini and Zanderighi 1991; Tauber 1981). New products can serve multiple strategic roles and thus new launches are very common across categories. For example, Nielsen estimates a new consumer packaged goods (CPG) product is introduced every two minutes in the United States (US) market (Nielsen 2019).

New product introductions are common, but their key challenge is the probability of achieving success. A common belief is that 80% of new products fail (Castellion and Markham 2013) and various sources claim that this rate can even reach 95% (e.g., Christensen et al. 2005; Gourville 2006). Regardless of the exact percentage, current rhetoric implies that new product investments are extremely risky. New products can, and still do, fail; however, most peer-reviewed evidence reports new product failure rates of 40% or less (Castellion and Markham 2013; Cierpicki et al. 2000; Crawford 1979; Crawford 1987). A change in the probability of new product success from 5% to 60% has a significant role in guiding new product investment decisions and feasibility.

The 40% new product failure rate reported in scholarly research was established by asking practitioners to evaluate success in several diverse industries, including capital goods and health care (Lee and Markham 2016). New products are a central strategic activity in the CPG industry, but there is limited evidence regarding whether failure is higher in this industry (Lee and Markham 2016). Given the relatively smaller body of knowledge that investigates new product failure rates in CPG categories and the different measures available, in addition to the ongoing changes in retail environments, this research undertakes a robust

investigation to understand failure rates in a CPG context.

This study investigated the incidence of new product failure in CPG categories, including when failure might be more or less common under various category and brand conditions. The present work builds on previous new product failure research (e.g., Barczak et al. 2009; Griffin 1997; Markham and Lee 2013; Page 1993) and is the largest study to date that investigates this issue in consumer categories. This study provides an understanding to assist and guide marketing practitioners in new product investment decisions.

We analyzed 83,719 commercialized new Stock Keeping Units (SKUs) and 14,912 new product lines introduced in the US market from 2002 to 2009. We investigated the new product failure rate in 31 different CPG categories (from beer to shampoo). An additional 14,814 new SKUs introduced in 2013 were examined to investigate whether the failure rate changes when different data sources are used (i.e., consumer panel and retail scanner data) and time periods. Failure was primarily examined for new SKUs, but new product lines (i.e. new brands and sub-brands) were also investigated. We extended past findings based on practitioner assessment and used a more novel measure to evaluate failure in secondary data; namely, new product 'survival' at one and two years after launch. Several category and brand conditions were also examined to understand when and how failure rates can vary.

This paper uses novel data and methods to generate three important findings, which complement the established findings regarding new product failure. First, our research found a new SKU failure rate that is comparable to a recent study using a comparable measurement approach (i.e., Wilbur and Farris 2014). This study demonstrates that one in four (25%) new SKUs fail one year after their introduction and, in the second year, the cumulative new SKU failure rate reached approximately 40%. Moreover, this study reported a similar (albeit lower) new product line failure rate compared with previous studies that use practitioner

assessment.

Finally, we extended previous studies by investigating failure in the consumer goods context. Within these categories, we explored category and brand conditions in which new products are more often introduced and have a greater chance of being successful. New SKUs are more common in higher sales categories; however, these categories have a higher failure rate. Conversely, higher market share brands also introduce more new SKUs, but new SKU failure is less common. These findings will assist marketing practitioners in understanding the relative risk of new launches, depending on the sales and growth trajectory of their brand and category.

This paper proceeds with a discussion of the relevant background and rationale for this research. Next, this paper outlines the approach of identifying new products and measuring success in secondary data and describes the Information Resources, Inc. (IRI) consumer panel data and Nielsen retail scanner datasets that were used. Next, the results are reported and discussed. Finally, this paper describes the practical implications of this research and suggests possible directions for future research.

2 Background

Only one in five new product ideas are commercialized (Markham and Lee 2013). Once commercialized, new products require considerable resources (i.e., time and money), which renders new product strategies very risky. Commercialized new products are believed to have a very slim chance of success—various sources reported that the new product failure rate nears 95% (Christensen et al. 2005; Gourville 2006). However, several new product development benchmarking studies have shown much lower rates, concluding those extreme failure rates are at odds with most available empirical evidence.

The earliest critical review that benchmarked new product performance was published approximately 40 years prior to this study (see Crawford 1979). Since then, every decade has included more reviews that continue to challenge the common 80% failure rate rhetoric (e.g., Castellion and Markham 2013; Cierpicki et al. 2000; Crawford 1987). The conclusion among these critical reviews is that the average new product failure rate is approximately 40%. The majority of these studies have surveyed practitioners and used practitioner knowledge to measure success. Further, they are weighted toward business-to-business markets. The 10 peer-reviewed benchmarking studies that report failure rates are summarized in Table 1.

<INSERT TABLE 1 ABOUT HERE >

Table 1 clearly demonstrates that an average 40% of new products fail. However, the failure rate is likely to vary with differences in (1) the data or method used, (2) the new product definition or sample, and (3) the new product success measure used (Crawford 1979). This is most evident when comparing the new product failure that was discovered in two more recent papers that have a very different approach to data, sample, and measurement.

Markham and Lee (2013), the most recent benchmarking study of this kind, provided insight regarding new product development activity in a range of organizations and industries by leveraging practitioner knowledge. This study, like numerous others that support the 40% failure rate, involved surveying practitioners in a mixture of industries, typically weighted towards including organizations operating in mixed or business-to-business markets (70%). This sample composition mirrors several studies because they interview members of the Product Development and Management Association (e.g., Barczak et al. 2009; Griffin 1997).

Further, Markham and Lee (2013) and other studies depicted in Table 1 have measured success by using practitioner knowledge. Specifically, these studies have asked practitioners to identify new products and judge how many have been successful in their

organization in the previous five years (e.g. Barczak et al. 2009; Cooper and Kleinschmidt 1995; Griffin 1997; Hultink et al. 2000; Page 1993). While the practitioner-evaluated success measure is the norm, this approach relies on practitioners' memories and an individual evaluation of success, which will vary between practitioners. It is important to note that the five-year period does not refer to the number of failures after five years. Instead, managers in these studies were asked to consider how many products they thought were successful out of all that had been launched in the past five years.

Wilbur and Farris (2014), in their study regarding distribution and market share in consumer goods, mentioned that new SKUs in the investigated had a new product failure rate of approximately 30%. Failure was measured as the cessation of sales within one year. While this result was not the study's key objective, it provides divergent evidence from work summarized in Table 1. Notably, the result suggests that failure rates may vary when different datasets (i.e., retail scanner), new product samples (i.e., new SKUs in CPG categories), and success measurement techniques (i.e., observed survival in market) are used.

The present study sought to replicate and extend knowledge regarding the new product failure benchmark in consumer goods categories by using consumer panel purchasing records and retailer sales data. We measured new product failure one and two years after launch. Our first research question was:

RQ1: What is the incidence of new product failure in consumer goods categories?

While the new product failure rate can vary across studies (e.g., Markham and Lee 2013; Wilbur and Farris 2014), failure rates can also vary according to different conditions within the same study. For example, one study demonstrated that new product failure rates are lower in North America compared with new products in Asia or Europe (Lee and Markham 2016). Another study showed that local organizations often had higher failure rates

compared with their internationally owned counterparts in the same market (Edgett et al. 1992).

Past research has documented how failure rates vary between business-to-business and business-to-consumer markets and between products (goods) and services (Lee and Markham 2016). However, that research is somewhat limited in the conditions that have been investigated within one category or industry. Numerous possible success conditions exist. This study examined four conditions: category size and growth, and brand size and growth. We used on these external conditions (i.e., conditions not related to the physical product) because they are key criteria that retailers use when deciding to adopt and stock consumer products (Pellegrini and Zanderighi 1991).

2.1 Category conditions

New product failure rates vary across industries (Lee and Markham 2016). Further, although it is valuable to document variation in the failure rate across industries, different categories within an industry may also have vastly different results. New introductions are more common in consumer categories with higher revenue (Martos-Partal 2012; Tan and Cadeaux 2011), which is likely because high-value categories receive more interest from retailers. New consumer products have lower trial and repurchase rates when introduced into competitive categories (Gielens and Steenkamp 2007); that is, categories with higher market concentration. Another study found that practitioner-evaluated new consumer product successes are more common in growing markets (Hultink et al. 2000). The questions surrounding new product failure and category conditions generated the second research question(s):

RQ2: How does the incidence of new SKU failure vary across consumer goods categories? Specifically, how does the failure rate vary for CPG categories with (A) higher,

(B) medium, or (C) lower sales, and with (D) growing, (E) stable, or (F) declining sales?

2.2 Brand conditions

Over five years, most organizations have at least one successful new product (Hultink and Robben 1999). However, is success more common in some organizations or brands than others? While higher revenue organizations tend to have lower new product failure rates (Lee and Markham 2016), the resources allocated to each brand within an organization's portfolio will vary. As such, the variation in resources is likely to vary the new product failure rate.

Brands with higher market shares are more likely to have more resources available. This is a possible explanation as to why higher share brands introduce new consumer products with higher trial and repurchase rates (Gielens and Steenkamp 2007; Sinapuelas et al. 2015). The resources available to new launches could also vary depending on the perceived potential of the brand introducing the new SKU (i.e., higher market share increases). More research is required to understand the relative investment risk for higher and lower share brands as well as brands growing and declining in market share. Therefore, this generated the third and final research question(s):

RQ3: How does the incidence of new SKU failure vary across brands in consumer goods categories? Specifically, how does the failure rate vary for brands with (A) higher, (B) medium, or (C) lower market share, and with (D) growing, (E) stable, or (F) declining market share?

3 Method and Data

3.1 Method

We investigated how common it is for new consumer products to fail and how failure

rates vary under certain category and brand conditions. We used the IRI consumer panel academic dataset (see Bronnenberg et al. 2008) to identify new SKUs and new product lines in 31 consumer categories in the US between 2002 and 2009. Nielsen retail scanner data for eight categories were also used to investigate whether the new SKU failure rate results persisted in other data sources. A commercial partner provided the Nielsen data.

New launches in this study are defined as new SKUs and new product lines. New product lines are new brand and sub-brand introductions (Hoskins and Griffin 2019), which include all SKUs introduced as part of the line. New product lines were also investigated because these new launches more closely resemble the 'new products' that are examined in the previous benchmarking studies. New launches are identified as SKUs and product lines with no sales revenue in the previous calendar year but have sales in the following calendar year (Abril and Sanchez 2016; Hoskins and Griffin 2019; Victory 2017).

3.2 New product failure measurement

New products can be introduced at any time. Therefore, we identified the quarter in which each new product was introduced and used this position to evaluate when the new launch failed (Trinh et al. 2015). We then looked forward by two years (eight quarters) after introduction to measure how many and how soon a new SKU or product line failed after launch. In this study, 'new product failure' is the permanent cessation of sales in the n successive period after launch (comparable with Wilbur and Farris 2014). New launches with zero sales nationwide in one quarter, but with sales in a subsequent quarter, are not classified as having failed.

Multiple or inclusive success measures are important because new products may perform well in some respects but not in others (Cooper 1984). We argued that the approach of measuring continued availability in the market (based on sales) is inclusive in capturing

success when compared with arbitrary sales benchmarks. This is because new launches might have minimal sales but continue to achieve their purpose by simply being on the shelf. New launches cannot be expected to be purchased if they are not available in their retailing partners. To answer RQ1, we reported the new SKU and new product line failure rates in each category and used a chi-square test of independence to test the statistical significance and relationship between the second-year failure rates, the category sales, and brand share conditions.

3.3 Category and brand characteristics

To answer RQ2, we investigated new products introduced into categories with higher and lower revenue sales and categories that were growing, declining, or that had remained stable in yearly revenue sales. Yearly sales revenue was used to classify each category into three equal groups—large, medium, or small. Large categories have higher yearly category revenue sales relative to the other categories in the same year.

Each category was classified as either growing, stable, or declining in year-on-year category revenue sales to examine new product failure rates by category dynamics. Most categories in each year were stable; however, in approximately 24% of cases, the categories were growing with year-on-year revenue increases above 5%. A 5 percentage increase or decrease in sales over 12 months was used as the threshold for growth or decline (Sharp et al. 2012).

Next, we classified brands in each category into three equal groups (large, medium, and small) based on their relative revenue market share to explore RQ3. Large brands have the highest (third of) revenue market share relative to other brands in their categories in the same calendar year. Small brands have the lowest (third of) market share in their category.

Brand dynamics was also investigated using a similar approach to the category dynamics analysis. Growing brands have year-on-year revenue market share increases greater than 5 percentage points, brands with a decrease of 5 percentage points or greater in market share are declining, and all other brands are stable. New SKUs introduced by private label brands or that had generic brand information were excluded. The variation in categories and brands included in our data assisted in building a greater understanding of the relationship between external conditions and new product failure rate.

3.4 Data

We used the IRI marketing academic dataset, described in Bronnenberg et al. (2008), to benchmark new consumer product failure in multiple categories, brands, and years (including before and after the 2008 Global Financial Crisis). The IRI consumer panel dataset covers multiple regions in the US from 2001 to 2011. By using 2001 as the initial observation window to identify new products, 83,719 new SKUs and 14,912 new product lines were introduced into the US grocery market between 2002 and 2009. The consumer categories investigated include food, beverage, personal care, and household products (see Table 2).

<INSERT TABLE 2 ABOUT HERE>

An additional analysis was conducted using Nielsen retailer scanner dataset (2012–2015), to compare how failure rates can vary for the same category in different datasets and years. Nielsen retail scanner data was used because practitioners have likened this data to a product census (Wilbur and Farris 2014). Using the sales data provided from participating US retailers, an additional 11,741 new SKUs were also analyzed, which were launched in eight consumer product categories in 2013.

Each new SKU and new product line are given a categorical outcome—success or

failure—at the first and second year after introduction. Aggregating these outcomes produces counts of success and failure. We converted these counts into proportions for reporting, which were then described for different market and brand conditions; namely, size and growth. These conditions were also coded as categorical. Combining the categorical outcome variable with the categorical conditions takes the form of a contingency table. Next, we examined how failure rates differ across conditions by analyzing each condition separately.

We used chi-square tests to determine whether the differences in failure rates across the conditions are overall statistically significant. Because categories and brands each have three conditions (small, medium, and large and declining, stable, and growing, respectively), multiple comparisons were required. Therefore, the overall chi-square test was considered inadequate. Instead, we calculated the standardized residual and its p-value (Agresti 2002; Iacobucci and Henderson 1997) for each condition. Because there were three levels in each of the category and brand conditions, we used a stringent significance level of $p = 0.001$, rather than the more lenient 0.05 or 0.01. This was selected to avoid possible Type 1 (false positive) errors arising from making multiple comparisons.

4 Results

We found that one in four (25%) new SKUs fail one year (four quarters) post-launch. The new SKU failure rate increases to 41% two-years post-launch (see Table 2). We found that, at one-year post-launch, failure rates ranged from 10% (razor blade category) and up to 35% (cold cereal category). The failure rate in the cold cereal category reached 54% two-years post-launch. New launches can be examined at the level of a new SKU or a more aggregated level as a new product line (brand or sub-brand). For the 14,912 new product lines investigated across the 31 categories, less than one in five (18%) fail one-year post-launch, which increases to 32% two-years post-launch (see Table 2).

Next, we compared new product failure rates for new SKUs in eight matched categories in the IRI consumer panel and the Nielsen retail scanner datasets. This analysis found that the new product failure rate is lower in categories in the Nielsen retail scanner dataset compared with the IRI consumer panel datasets (see Table 3). This difference may be from the year investigated or the data collection approach itself (retail scanner vs. consumer panel). For example, consumer panel data likely excludes less popular products and brands. More research is required to isolate the cause of the anomaly across different data sources.

<INSERT TABLE 3 ABOUT HERE>

These findings answered RQ1 and confirmed that new product failure rates for new SKUs and new product lines are much lower than widely believed by practitioners. However, more exploration is needed to understand the category and brand conditions in which the failure rate can vary. Findings of these conditions may progress our knowledge regarding new product failure rates toward an empirical generalization (e.g., Barwise 1995).

Next, to address RQ2, Table 4 shows that large (i.e., higher yearly sales) categories have more new SKU introductions (51,257 (61%) of a total of 83,719 total new SKUs) and a higher failure rate (45%) than new SKUs introduced in medium and small categories (both 36% two-years post-launch). The difference in the failure rate across the category conditions was statistically significant, X^2 (2, N = 83719) = 633.50, p < .001. New SKU failures in the second year in large categories were significantly different from the medium or small categories, with a standardized residual of 12.0, which is significant at $p < 0.001$.

<INSERT TABLE 4 ABOUT HERE>

Most of the categories investigated are stable and these categories have more new SKU introductions (approximately 50% of total new SKUs). We found that new SKUs in

stable and declining consumer categories have similar failure rates one- and two-years post-launch (see Table 4). New SKUs introduced into growing categories at launch have comparatively higher failure rates one and two years later (30% and 45%, respectively). The difference in failure rate across the category dynamics condition is statistically significant X^2 (2, N = 83719) = 293.13, p < .001. More specifically, the standardized residual for new SKU failures in growing categories two-years post-launch is 9.7, which is statistically significant at p < 0.001.

Finally, to explore RQ3, Table 4 demonstrates large brands (i.e., higher market share brands) introduce more new SKUs (66% of total new SKUs) than medium (20%) and small (14%) market share brands. However, new SKUs launched by small brands have a proportionally higher failure rate two-years post-launch (48%) compared with large and medium share brands (both approximately 40%). The relationship between brand size and new SKU failure rate was statistically significant, X^2 (2, N = 83719) = 230.81, p < .001. The standardized residual for new SKUs launched by small share brands was 10.7, which is significant at p < 0.001.

Stable brands have the largest share of SKU introductions (98% of total new SKUs) compared with brands growing or declining in revenue market share. Growing brands have a lower chance of being failures (a failure rate of 26% two-years post-launch) compared with brands that are stable (a failure rate of 40% two-years post-launch) or declining (a failure rate of 35% two-years post-launch) in revenue share (see Table 4). The relationship between growth and failure rate was statistically significant, X^2 (2, N = 47636) = 68.99, p < .001. The second-year failure rate for new SKUs introduced by growing brands had a standardized residual of −6.3, significant at p < 0.001. Note, the sample in this analysis is lower because there are no sales records in the previous year for SKUs introduced by new brands.

5 Discussion

We examined the failure rate for new product launches in 31 consumer goods categories introduced to the US market, including new SKUs and new product lines. Our study supports the existence of a lower new product failure rate (e.g., Castellion and Markham 2013; Cierpicki et al. 2000; Crawford 1979; Crawford 1987) in a new SKU and CPG context. The 25% new SKU failure rate one-year post-launch (see Table 2) mirrors the new product failure rate in Wilbur and Farris (2014) (29%), which uses a comparable measure of new SKU identification and failure rate in similar categories.

In comparison with new SKUs, new product line introductions on average have an even lower failure rate (Table 2). The new product lines are perhaps more similar to the approach that practitioners have used to define new products in past benchmarking research. The similarity between the new product line failure rate and failure rates in past research (see Table 1), or at least the absence of extreme rates, are encouraging to marketing academics who wish to adopt a measurement approach for new product success (failure) using consumer panel data.

The failure rates reported in this paper should be encouraging for marketing practitioners. Even in consumer goods categories, the chance of failure is lower than what is widely believed. However, it does not appear that the new product failure rate has improved over time. This is surprising considering the continued academic interest in understanding success and the opportunity within organizations to learn the innovations that did or did not work. However, the stable new product failure rate is suggestive of an unseen improvement over time because market environments might have become even more competitive and new product activities even more sophisticated, as first proposed by Crawford (1987).

In addition to building on previous research and investigating new product failure

rates in consumer goods categories, we identified previously unexamined conditions in which new product failure rates are higher or lower than the industry average. New launches in more popular categories may be necessary to compete (and placate retailers' requests). Categories with more sales (i.e., large categories) have more new SKU launches; however, these new launches have a higher risk of failing compared with medium or small categories. Categories with higher revenues have greater retailer interest (Martos-Partal 2012) and more competition, which is a likely reason as to why there are more new introductions, but higher failure rates compared with other categories. Growing categories—another group with high retailer interest—typically have several new SKU introductions and higher failure rates when compared with stable or declining categories. We encourage marketers to use the failure rate, in addition to other success measures, to evaluate the performance of launches more broadly.

Higher share brands (i.e., large brands) introduce a higher number of new SKUs; however, these brands have lower failure rates compared with introductions by lower share brands. Further, brands increasing in market share (i.e., growing brands) have lower new product failure rates. Higher share brands have more resources to support launches and enjoy wider distribution (Farris et al. 1989), greater brand recall (Romaniuk 2016), and heavier parent brand buyers to draw on for the purchase of the new launch (Tanusondjaja et al. 2016). This supports the suggestion that increased marketing support (i.e., mental and physical availability) assists in mitigating failure, which reinforces the importance for brands to provide sufficient support to new product launches.

Marketing practitioners continue to engage in new product development activities and research continues to explore new product failure (Barczak 2014). This study answered previous research requests regarding identifying the conditions in which new product failure rate might be higher or lower (Cierpicki et al. 2000). Our results extend the current new

product failure rate benchmarks in the consumer goods context. We demonstrate that the new product failure is less common than widely believed, even when using a novel new product identification and failure rate measurement approaches.

The chance of failure when introducing new launches can vary. Therefore, we encourage marketing practitioners to use this research as a resource to guide decision-making. New SKU failures are more common among smaller share brands, which reinforces the importance of smaller brand marketers to ensure their new launches are relevant to category buyers and easy to find and buy (Nenycz-Thiel et al. 2016).

5.1 Limitations and future research directions

This research is not without its limitations. The study used a novel measure to evaluate failure. The measure could be criticized because it does not capture all possible dimensions of success (Cooper and Kleinschmidt 1995). However, it does capture several perspectives because new products cannot meet any objectives if they are not available in retailers. We acknowledge that this measure does not capture the reason *why* the new product had a cessation in sales (i.e., consumer, retailer or manufacturer induced).

A possible avenue for future research would be to examine how the failure rate measure relates to other common success measures (e.g., market share), to understand the types of success that are captured in this approach. For example, do new items that fail soon after launch have lower market shares compared with items that do not ultimately fail? The failure rate measure and approach to identify new products (SKUs and product lines) relies on the breadth and accurate reporting of consumers and retailers in secondary data. However, we did not observe any evidence of data providers systematically excluding products that are unable to meet certain sales or distribution benchmarks.

This study, like most others in new product development, investigates new products in a single market and predominantly in a US context (Page and Schirr 2008). New products have almost a 20 percentage point variation in failure rates across regions (Markham and Lee 2013). We encourage future research to replicate our findings in more diverse markets to strengthen knowledge in this area.

Another avenue for future research is to extend the conditions investigated and examine the failure rates for different types of new products. New products introduced using an established brand name have a greater chance of being trialed (e.g., Gielens and Steenkamp 2007; Sinapuelas et al. 2015). Therefore, it is likely that new SKUs introduced by established brand names would have lower failure rates. We encourage that more studies explore this condition, in addition to other studies that examine failure rates for new products introduced by different types of new brands (e.g., new brands and brand extensions) and new products with varying levels of innovativeness (e.g., radical and incremental).

TABLES AND FIGURES

TABLE 1. Summary of new product failure rates in previous peer-reviewed publications

	% FAIL	MEASUREMENT	SAMPLE		
		Failure	Market	% B2C	# Firm/SBU
Edgett et al. (1992)	43	Firm judged	US	32	202
Cooper and Kleinschmidt (1995)	43	Firm judged	Multiple	-	135
Hultink et al. (2000)	42	Firm judged	Multiple	42	617
Page (1993)	42	Firm judged	Multiple	-	189
Hultink et al. (1998)	41	Firm judged	Multiple	-	622
Barczak et al. (2009)	41	Firm judged	US	25	416
Griffin (1997)	41	Firm judged	US	18	383
Cooper et al. (2004)	40	-	US	-	105
Markham and Lee (2013)	39	Firm judged	Multiple	28	453
Hultink et al. (1997)	38	Firm judged	UK	-	138
MEAN	**41**				

TABLE 2. Data description and new SKU and new product line failure rate in each category

	FAILURE – NEW SKU			FAILURE – NEW PROD LINE			CATEGORY PERFORMANCE		
	% Yr 1	% Yr 2	# New	% Yr 1	% Yr 2	# New	$ Billion	%Δ	# Brands
Cold cereal	35	54	3115	21	39	612	3.5	0.4	1098
Mayonnaise	31	45	498	15	30	93	0.6	2.7	205
Carbonated beverages	29	43	5716	22	33	507	6.4	-0.1	820
Salty snacks	29	50	12878	22	39	1626	3.9	3.7	2330
Beer (incl. ale & cider)	29	42	8492	18	32	3101	4.3	3.8	5384
Photography supplies	29	49	262	19	37	78	0.1	-9.3	108
Cigarettes	28	50	3545	20	39	492	2.1	-3.1	669
Milk	28	44	4307	25	42	646	5.7	0.4	747
Frozen pizza	27	44	2022	16	26	254	1.5	2.9	428
Yogurt	24	44	3213	15	32	291	2.0	7.5	488
Toothbrush	24	41	2133	18	32	837	0.2	11.3	976
Frozen dinners	24	38	5155	20	34	845	2.8	9.5	1056
Mustard & ketchup	24	40	998	15	32	261	0.4	1.6	585
Soup	23	34	3995	21	30	682	1.8	7.0	726
Peanut butter	22	35	497	18	31	121	0.5	3.7	136
Margarine & butter	22	37	292	25	42	59	0.7	2.2	148
Coffee	22	36	6080	18	29	915	1.4	7.1	879
Laundry detergent	21	40	2251	13	21	141	1.5	0.3	221
Household cleaner	21	35	2345	14	28	857	0.4	33.8	831
Facial tissue	20	43	568	13	38	60	0.5	-1.2	129
Diapers	19	36	1202	11	18	65	0.7	-0.4	129
Frankfurters	19	35	971	17	30	206	0.9	0.8	485
Sugar substitutes	17	29	254	19	24	68	0.2	6.9	138
Deodorant	17	39	2394	9	18	240	0.4	-0.2	411
Toilet tissue	16	35	635	22	43	49	1.7	2.5	115
Spaghetti/Italian sauce	16	27	1948	10	20	342	0.9	2.1	687
Paper towels	15	33	557	15	28	40	1.1	2.4	92
Shampoo	15	33	5025	13	26	993	0.4	0.0	1759
Toothpaste	13	33	1611	14	25	251	0.5	0.2	398
Razors	11	25	222	2	11	55	0.0	3.2	90
Blades	10	27	538	9	19	125	0.3	0.1	214
Total/Mean	**25**	**41**	**83719**	**18**	**32**	**14912**	**47**	**3.3**	**22455**

TABLE 3. Comparing new SKU failure rate in consumer panel and retailer scanner data

	FAILURE - CONSUMER PANEL			FAILURE - RETAIL SCANNER			DIFFERENCE	
	% Yr 1	% Yr 2	# SKU	% Yr 1	% Yr 2	# SKU	% Year 1	% Year 2
Beer	29	42	8492	12	26	2585	17	16
Diapers	19	36	1202	14	21	442	5	15
Yogurt	24	44	3213	16	37	780	8	7
Salty Snacks	29	50	12878	22	41	3899	7	9
Coffee	22	36	6080	14	33	1272	8	3
Carb Bev (Soft Drinks)	29	43	5716	31	46	713	-2	-3
Toilet Tissue	16	35	635	14	22	279	2	13
Shampoo (Hair Care)	15	33	5025	16	25	1771	-1	8
Total/Mean	**23**	**40**	**43241**	**17**	**31**	**11741**	**6**	**9**

TABLE 4. New SKU failure rate across category and brand size and dynamics

	CATEGORY CONDITION							BRAND CONDITION						
	Total	Year 1			Year 2			Total	Year 1			Year 2		
	# SKU	# Succ	# Fail	% Fail	# Succ	# Fail	% Fail	# SKU	# Succ	# Fail	% Fail	# Succ	# Fail	% Fail
Large	51257	37032	14225	**28**	28294	22963	**45*** **	55382	41726	13656	**25**	32938	22444	**41**
Medium	18482	14582	3900	**21**	11789	6693	**36**	16502	12986	3516	**21**	9941	6561	**40**
Small	13980	11585	2395	**17**	8983	4997	**36**	11835	8487	3348	**28**	6187	5648	**48*** **
Total/Avg	**83719**	**63199**	**20520**	**25**	**49066**	**34653**	**41**	**83719**	**63199**	**20520**	**25**	**49066**	**34653**	**41**
Growing	37899	26509	11390	**30**	21001	16898	**45*** **	754	649	105	**14**	556	198	**26*** **
Stable	40754	32654	8100	**20**	25006	15748	**39**	46782	35843	10839	**23**	27558	19224	**41*** **
Declining	5066	4036	1030	**20**	3059	2007	**40**	100	79	21	**21**	65	35	**35*** **
Total/Avg	**83719**	**63199**	**20520**	**25**	**49066**	**34653**	**41**	**47636**	**36671**	**10965**	**23**	**28179**	**19457**	**41**

*** *year 2 new SKU failure rate is statistically significantly different to the other failure rates at p<0.001*

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