

## COMPARATIVE ANALYSIS OF THREE EMPIRICAL STUDIES REGARDING NEW PRODUCT DEVELOPMENT/SUCCESS

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**ABSTRACT:** Recently, companies need to be more responsive in order to meet the rapid changes considering both consumer preferences and managerial practices. From a marketing perspective, new product development is an important issue that needs to result with new product success at the end in order to act as a sustainable competitive advantage for the firm. The aim of this paper is to compare three different empirical studies that investigated new product development/success. Different empirical approaches such as survey, qualitative case study, and experiment have distinct values. A main conclusion of the three articles is that uncertainty and risk are factors that should be taken into account when investigating new product development/success. An important conclusion of this paper is that different empirical approaches has diverse values in terms of advantages they incur, and they add crucial findings and insights to the literature.

**Key Words:** Marketing, New Product Development, New Product Success, Empirical Studies, Comparative Analysis

**Type of article:** Research

**Jel Classification:** M190, M100, M310

**Received:** 05.06.2020 / **Accepted:** 28.09.2020 / **Published:**11.12.2020

## YENİ ÜRÜN GELİŞTİRME/BAŞARISI KONUSUNDAKİ ÜÇ AMPİRİK ÇALIŞMANIN KARŞILAŞTIRMALI ANALİZİ

**ÖZ:** Günümüzde, işletmeler tüketici tercihleri ve yönetsel uygulamalar bağlamında yaşanan hızlı değişimleri karşılamak için daha hızlı tepki vermelidir. Pazarlama bakış açısı ile, yeni ürün geliştirme önemli bir konu olup, işletmeye sürdürülebilir rekabetçi avantaj sağlaması bakımından bu süreç yeni ürün başarısı ile sonuçlanmalıdır. Bu çalışmanın amacı yeni ürün geliştirme/başarısı konusundaki üç farklı ampirik çalışmayı karşılaştırmaktır. Anket, nitel vaka çalışması ve deney gibi farklı ampirik yaklaşımlar farklı değerler sunmaktadır. Üç çalışmanın ana sonucu, yeni ürün geliştirme/başarısı konusu incelenirken belirsizlik ve risk faktörlerinin de dikkate alınması gerekliliğidir. Bu çalışmanın önemli bir sonucu ise; farklı ampirik yaklaşımlar yarattığı avantajlar bakımından farklı değerler sağlamaktadır ve literatüre kritik öneme sahip bulgular ve kavrayışlar sunmaktadır.

**Anahtar Kelimeler:** Pazarlama, Yeni Ürün Geliştirme, Yeni Ürün Başarısı, Ampirik Çalışmalar, Karşılaştırmalı Analiz

**Makalenin türü:** Araştırma

**Jel Sınıflandırması:** M190, M100, M310

**Geliş tarihi:** 05.06.2020 / **Kabul Tarihi:** 28.09.2020 / **Yayın Tarihi:**11.12.2020

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**Kaynak gösterimi için:**

KARAYALÇIN, C. (2020). Comparative Analysis of Three Empirical Studies Regarding New Product Development/Success. Antalya Bilim University International Journal of Social Sciences, 1 (2), 5-14.

## INTRODUCTION

Today's world is characterized by information and technological developments. This new era enables people to reach information, interact more as the world also became more globalized. From a business perspective, these developments enable firms to come up with new products much easier. Innovation and technological developments lead firms to maintain sustainable competitive advantage (Droge, Calantone & Harmancıoğlu, 2008). By introducing new products, differentiation can be achieved. On the other hand, the level of uncertainty and risks were increased in the global arena which may have an effect on new products. Mullins and Sutherland (1998) state that great level of risk growing in rapidly changing markets requires diverse practices of new product development which may lead to an increase in new product success. The main aim of this paper is to compare and discuss three different empirical studies and come up with conclusions regarding the empirical approaches of the studies which are survey, qualitative case study (which will be referred as case study here after) and experiment. In order to achieve this goal, articles which have a similar and recent topic were chosen to be analyzed. As stated above, new product development/success is an important issue of this era. Furthermore, new product development topic has been recently studied in the marketing literature (e.g. Morgan and Anokhin, 2020; Liu and Shi, 2020; Tang and Marinova, 2020). Consequently, three articles with new product development/success topics were selected for the purposes of the study. Regarding the selection criteria; the three articles were published in journals that are indexed in Social Sciences Citation Index (SSCI) and have similar citation numbers (between 267 and 273 as of June 2020; according to Google Scholar). The three articles that used different empirical approaches are: (1) Droge et al. (2008) which investigated factors influencing new product success with a moderating effect of uncertainty in the market by conducting a survey; (2) Mullins and Sutherland (1998) that conducted a case study with a qualitative approach which authors have come up with important practices that enhance new product success in uncertain environments; (3) Herzstein, Posovac and Brakus (2007) that investigated purchase intentions of different types of consumers (which can be considered as new product success) and effect of self-regulation systems where risk factor is also mentioned. The article was based on experiments. The main aim of this paper is to analyze, investigate, and compare three different research approaches used in these three articles in terms of their value and findings. This paper will begin with the review of the three articles; then comparison of the articles and empirical approaches will be elaborated; consequently, discussion and conclusion part will be provided.

### 1. Review of the Articles

#### 1.1. Droge et al. (2008) – Survey

Droge et al. (2008) investigated four different factors (proactive strategic orientation, organizational structure, innovativeness, and market intelligence) under managerial control that have an effect on new product success (dependent variable). Considering the conceptual model of the paper, innovativeness and market intelligence are mediating factors regarding new product success. There is also one moderating independent variable which is environmental uncertainty. Droge et al. (2008) aimed to clarify the mediating, direct and moderating factors that affect new product success. In line with Ferber

and Verdoorn (1962), use of a survey will give the opportunity to authors to fit the data right into the specific problem and hypothesized relationships.

Droge et al. (2008) first investigated and analyzed the specific literature and theories and then formulated eight different hypotheses. Survey research method is deductive which means that before conducting the study, variables are selected from the theory (Merriam, 1988). Droge et al. (2008) followed a deductive approach which offers an advantage of testing and explaining causal relationships of variables (Saunders, Lewis & Thornhill, 2009). Hypotheses mainly include the effects among four variables mentioned above, and their causal relationship between new product success. The last two hypotheses also include the moderating effect of environmental uncertainty which also has a considerable effect.

The sample was composed of 346 manufacturers that are listed in the Fortune 500. Data collection methods can be divided into three types such as personal interview, mail, and telephone (Ferber and Verdoorn, 1962). Prior to sending a mail questionnaire, Droge et al. (2008) called each firm by phone to increase the rate of participation. Authors used guidelines of Campbell (1955) during questionnaire. Respondents were senior managers; some had responsibilities for product innovation while others were responsible for management at strategic business unit. After telephone contacts and sending the questionnaires to all 346 manufacturing firms across 41 industries, it was observed that the response rate was 58%.

Considering measurement, Cronbach's alpha co-efficients for all multi-item scale measures were performed. The reliability co-efficient of the items were between 0.75 to 0.875 which were acceptable according to Nunnally (1978). Uncertainty was measured by environmental turbulence using Miller and Droge's (1986) scale. New product success was measured as respondents rated financial success of new products on two 11-point scales. In general, all items were in line with its specific construct (Droge et al., 2008).

Although the variables forming the questionnaire that Droge et al. (2008) used were common in previous literature; in order to confirm the validity, they performed a confirmatory factor analysis. After analyzing several statistical measures (e.g. NNFI, CFI, RMSEA), they concluded that the measurement model fits well. Moreover, convergent and discriminant validities were tested. After conducting the necessity investigation about variables' cross-loadings, eigenvalues, and langrangian multiplier test, convergent and discriminant validity was achieved.

There are some valuable conclusions after analyzing the results of the survey study. The first is that market intelligence and innovativeness are mediating factors of strategy proactiveness and organizational structure. The effect of uncertainty to new product success alters with those mediating factors. Innovativeness directly affects new product success when environmental uncertainty is high. On the other hand, market intelligence enhances new product success when environmental uncertainty is low. Overall, there is a significant effect of environmental turbulence to the new product success also considering strategic proactiveness and organizational structure.

## **1.2. Mullins and Sutherland (1998) – Qualitative Case Study**

The main aim of this study is to identify specific practices that lead ultimately to high product success in an uncertain environment. To achieve this specific goal, qualitative case study research method was used in this article. Stake (1995) states that the main objective of a case study is about particularization and uniqueness. Mullins and Sutherland (1998) aimed to investigate specific unique cases which makes case study valuable for the study. The case study was performed by conducting in depth interviews and analyzing them within their uniqueness.

There are several characteristics and terminology in order to distinguish qualitative case studies. Merriam (1988) states four different essential features of case study which are particularistic, descriptive, heuristic, and inductive. Considering Mullins and Sutherland's (1998) article, the case study research method used has inductive reasoning. There was no hypothesis in this article since it is a qualitative case study. In this type of study, discovery of new relationships, concepts are common characteristics rather than verification. Moreover, it is descriptive and exploratory in the same logic as mentioned above. By taking a holistic view of situations, particularization was also applied in this study. The main aim of this paper is to get specific information including specific situations. Consequently, considering the above features, Mullins and Sutherland's (1998) decision of conducting a qualitative case study research approach is reasonable.

Prior to conducting interviews, the authors defined the important issues for further exploration. In this study, uncertainty and practices are the main issues to be uncovered. The authors identified three levels of uncertainty: (1) Potential customers are not able to easily communicate needs that a new technology fulfills; (2) New product development managers are not certain about how to convert new technology into successful new products; (3) Senior management faces difficulty regarding how much and when to invest in rapidly changing markets. Considering practices, they aimed to find practices that will lead new product success in uncertain environments.

After defining the concepts, selection of the company took place. In case study, there is an important criterion which is to maximize what can be learned and comprehended (Stake, 1995). Mullins and Sutherland (1998) chose US WEST, Inc., a large multinational firm in telecommunication industry in North America. This company was chosen because they are acting in a rapid changing market which has launched new product development programs across its market units which might maximize learning for this specific case. They wanted to "benchmark" across the firm's market units and try to find best practices. The main reason for choosing a services firm is that mostly, new products research has been conducted in manufacturing firms.

The research contains a series of 16 retrospective in depth interviews with managers of US WEST, Inc. who have been directly involved in producing and managing new products. These managers are at the level of manager-level, director-level, and vice-presidential positions who are involved in new product process intensely which increase the value of the data. In that sense the interviews were unbiased (e.g. participation bias) in their nature. However, it could not discard the effect of subjectivity which is a problem of case studies (Merriam, 1988). The interviews were conducted by the first author for duration of at most two hours. Some cases were continued with additional conversations in order to clarify some points. Most of the interviews were recorded while small number of interviews were noted by a student.

Stake (1995) states that asking the right questions are crucial to get accurate information. There is a high probability of asking questions which may result with unwanted answers. Mullins and Sutherland (1998) asked each participant in their case study to discuss two new products entering the market; one being successful and the other unsuccessful. After analyzing the interviews and the specific cases, Mullins and Sutherland (1998) found effective practices for dealing with the three levels of uncertainty which characterized rapidly changing markets. Those are important practices for new product development processes in uncertain markets which ultimately lead to successful new products.

### **1.3. Herzenstein et al. (2007) – Experiment**

The last paper used experiment, which was conducted with the consumers and regarding their purchase intentions of new products. In their study Herzenstein et al. (2007) tried to explore the effect of consumers' self-regulation systems and risk salience to the purchase intentions (which can be considered as new product success) of new and really new products. They also categorized consumers into two groups: Promotion-focused and prevention-focused consumers.

This article conducted experiments. Experimental research assumes that researcher can manipulate the variables which offers more control (Merriam, 1988). Moreover, experiments are very valuable if the authors want to test causal relationships with control; where Herzenstein's et al. (2007) choice of experiment is suitable.

Considering methodology, three studies were conducted. The first one is a field study and the other two were experiments. In line with Saunders et al. (2009), hypotheses were conducted and tested with respect to previous literature which is deductive. In the field study, a questionnaire was asked to participants in a mall in order to manipulate the results for the experiments. One hypothesis was tested and supported; that is promotion-focused consumers are more likely to buy new and really new products than prevention-focused consumers.

Experimental design is an important procedure that refers to activities and planning of the experiments (Patzer, 1996). Study 2 was an experiment. The main aim of this experiment is to investigate the relationship of new product success uncertainty and promotion-focused, prevention-focused consumers' intentions; and relationship between risk salience and promotion-focused and prevention-focused consumers' purchase intentions. A really new product was the focus of this experiment - a vehicle that could function as a car and a boat. All participants read the description of the product. They manipulated the risk salience by presenting specific quotations which first was related to "implicit-risk condition" and second was "explicit-risk condition". They also manipulated regulatory focus with different scenarios regarding promotion or in prevention terms that urged the need to buy the car/boat. Participants were 203 MBA students who were randomly assigned to the experiment. Participants were asked to think that buying this product is financially available.

Considering dependent variables and measures of Study 2, to ensure that car/boat was perceived as really new products, two open ended and two nine-point Likert-type questions were asked to participants. They measured risk salience and regulatory focus on purchase intentions with two nine-point Likert-type questions. The results showed that

promotion focused consumers judging the product in implicit-risk context have higher purchase intentions (which could be interpreted as new product success).

Study 3 is the other experiment that aimed to further investigate results from Study 1 and Study 2. Another aim was to test another hypothesis. They manipulated regulatory focus and newness of the product. They formed two different types of advertisement featuring the identical camera but with different promotional text. They pre-tested the advertisements with twenty-two undergraduate students. One hundred sixty-six undergraduate students participated to the main experiment. The measurement was same with Study 2. In general, study 3 replicated the findings found in Study 2 which increases the value of the article.

## **2. Comparison of the Articles and Empirical Approaches**

All three articles that are reviewed above used different research techniques that have valuable specific advantages and some disadvantages. With respect to the choice of data and data collection methods Ferber and Verdoorn (1962) distinguished between two different sources. The first group is “data already available” where data can be found from government or official statistics, internal-external records, private information, e.g., firms in a specific industry. Ferber and Verdoorn (1962) state that major advantages of using this are the substantial savings in money and time. This type of data is not used in the selected articles.

The second group is “data not available”. In this group two techniques may serve as standpoints which are survey and experiment (Ferber & Verdoorn, 1962). Additionally, case study containing interviews is also another technique. Buckingham and Saunders (2004) define survey as a method of acquiring information about a specific group of people by asking questions to them. The main advantage of survey is statistical information about attributes, attitudes or actions of a specific population or issue can be collected in a standardized manner. Droge et al. (2008) aimed to identify the effect of mediating and moderating independent variables’ effect to the new product success and asked whether it is controllable by managers in uncertain environments. Considering the goal of the paper, standardized answers needed for a specific issue which makes survey method appropriate for Droge’s et al. (2008) article.

The second technique for “data not available” group is experiments. Patzer (1996) mentions the important feature of the experiments which is the unique feature of “control”. Moreover, Patzer (1996) states that survey could provide much more information than observations; however, experiment may be even a better method to collect more information compared to surveys. Herzenstein et al. (2007) aimed to uncover the specific independent variables that have an effect on purchase intentions of two different types of consumers which require much more specific precise data. In that sense, choosing experiment has provided valuable advantages for the article.

Returning to paper of Mullins and Sutherland (1998), the authors used a case study approach which they collected data from a specific firm in telecommunications industry. Case study is used when trying to comprehend complex social phenomena (Yin, 1994; Baxter and Jack, 2008). In their study Mullins and Sutherland (1998) tried to find out the suitable managerial practices for new products in uncertain rapidly changing environments which is a complex subject in nature. Case study provides an advantage for this paper compared to

other methods. Another advantage is that survey method typically evaluates small number of variables across a large number of instances, whereas case study focuses on a single unit (Merriam, 1988). Stake (1995) categorizes qualitative researchers as nondeterminist, constructivist, and noninterventionists. That is, they try to understand what would have happened, and not try to draw attention to themselves. Mullins and Sutherland (1998) picked a single company and made various interviews and reported the specific cases for an in-depth information. Furthermore, uniqueness is also a strength of case studies (Stake, 1995; Merriam, 1988) that Mullins and Sutherland (1998) got benefit from applying this approach.

There are also some drawbacks of case studies. Case studies may often lack “generalization” (Yin, 1994; Stake, 1995; Merriam, 1988). Only limited number of cases are studied which prohibits generalization of case study. Consequently, the external validity of case study approach may be lower compared to survey and experiment methods. Mullins and Sutherland (1998) chose a single company to study, used interview technique to collect data, and found out six different practices for new products. Considering interviews, there is the chance of asking wrong questions to the interviewee. Besides, with interviews, the problem of “subjectivity” (triangulation and interpretation of the data) may arise which also decreases the internal validity of the research (Merriam, 1988). In that sense, Mullins and Sutherland’s (1998) study is less statistically significant compared to other two articles. However, the nature and goal of the case study is different than survey and experiments, and case study creates diverse value by providing detailed information regarding a specific issue.

Droge et al. (2008) used survey methodology in their research. Surveys have different advantages. The main advantages of survey methodology are timely information obtained and the flexibility which allows fitting the data right into the problem in the research question (Ferber & Verdoorn, 1962). Saunders et al. (2009) also mentions advantages such as the hypothesis testing and structured methodology to generate replication. For objectivity researchers should be independent of what is being observed. Droge et al. (2008) sent questionnaires by mail to participants which make objectivity higher compared to Mullins and Sutherland’s (1998) research. In addition to this, generalization is higher compared to case studies since the sample is various and bigger. Moreover, measurements, factor analysis, construct validity tests increase the statistical significance level of the article compared to Mullins and Sutherland’s (1998) article.

Fowler (1994) states that a survey mainly contains three parts. These are sample, designing the question and data collection. The sample Droge et al. (2008) used was 346 manufacturers across 41 countries at the beginning but the response rate was only 58% which left 202 manufacturers for use. This can be interpreted a disadvantage of this research. Considering the design of the question and pre-testing, questions were closed-end questions which decreased the subjectivity level. Ferber and Verdoorn (1962) states that pre-testing in surveys with a small sample group can be done to ensure the structure and the quality of the questions. Droge et al. (2008) contacted each firm to encourage participation which is not a pre-test; but may be considered as an advantage of the study. The main disadvantages of surveys are they cost high and that they are time consuming.

The method used by Herzenstein et al. (2007) is experiment. They conducted 3 studies, the first one is a field study conducted by a questionnaire, and then two experiments were done. Experiments have great advantages. The researcher can manipulate

and control the variables which result in much more accurate findings. Moreover, the researcher can investigate cause-effect relationships (Merriam, 1988). Furthermore, experiment gives the researcher the opportunity to test different values of an independent variable which can be tested at the same time and as a result, the effects of each tested value can be specified (Patzner, 1996). Herzstein et al. (2007) got benefit from these specific features of experiments.

Schoemaker (1980) stresses out some disadvantages of experiments. The artificial nature of experiments may make the findings unrepresentative. Sample is another negative part of experiments. Sample may not be representative for all other fields. Taking all advantages and disadvantages discussed above into account, the statistical significance level of experiment may be higher than case study; but may be questionable compared to surveys. However, as in case study, the statistical significance level is not the only outcome to test the value of the methods, and each method has its own unique value for specific research questions.

### **3. Discussion and Conclusion**

In the marketing field new product development/success is a dynamic topic that depends on different types of independent variables and different phenomena. In that sense, different empirical approaches may be suitable for different types of research questions. This paper aimed to compare three different empirical approaches namely survey, case study and experiment by selecting three articles in that field. It is important to note that the articles that were analyzed are not addressing the same research question but at least the field is the same. In order to compare the three different empirical studies; their advantages-disadvantages, specific features were examined in order to come up with conclusions. Different types of methodologies have several distinctive features. Looking to the results of the papers, the general conclusion is that uncertainty and risk factors play an important role considering new product development/success. The three different research methods enlightened the literature with different perspectives.

Considering the results of the comparison of the three empirical approaches, case studies with a qualitative approach do not test causal relationships and they are unstandardized. Moreover, one cannot control case studies and generalizations may not be made considering case studies. Consequently, case study is a less statistically significant method compared with others which is in line with its nature. However, it has distinct values for certain types of research questions. With case studies, detailed and in-depth information can be achieved. On the other hand, surveys have larger data sample, test causal relationships and hypotheses, and there is higher level of control. Experiments also contain causal relationships, control and manipulation on variables that are being tested. Therefore, survey and experiments are considered to be more statistically significant methods.

As a general conclusion, each of the three articles that were compared in this paper has different perspectives and values. By using three different types of methods in a specific field, each article contributed to the literature with valuable findings. The selection of the research methods of the articles were logical and have their own reasons. Every research method adds significant results to the literature with respect to their own unique features. Although the statistical significance level of case study, survey, and experiment differ, each

method has distinctive substantial aspects in their own nature which adds novel contribution to the literature.

There are some limitations of this paper. The first one is that the topic chosen is a dynamic topic which may alter the results of the paper. Moreover, the results might vary between different industries and different countries. The other limitation is that the three articles are not addressing the exact same research question which might have an effect on comparison of the three methods. Future research may compare empirical approaches choosing a much more static and narrowed down research topic.

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