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*EVALUATING THE IMPACT OF DIGITAL MEDIA ON PROSPECT CONVERSION IN NONPROFIT ORGANIZATIONS: AN ACTION RESEARCH*

BY

*DIVYA RAMACHANDRAN*

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctor of Philosophy

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY  
ROBINSON COLLEGE OF BUSINESS  
2022

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## ACCEPTANCE

This dissertation was prepared under the direction of the *DIVYA RAMACHANDRAN* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

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ABSTRACT

*EVALUATING THE IMPACT OF DIGITAL MEDIA ON PROSPECT CONVERSION IN NONPROFIT ORGANIZATIONS: AN ACTION RESEARCH*

BY

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*July 11, 2022*

Committee Chair: *Dr. Naveen Donthu*

Major Academic Unit: *Marketing*

Nonprofit organizations struggle to leverage digital marketing to achieve their primary goal of understanding and addressing the needs of their target audience to convert their prospects. Using action research, we conceptualize a strategic digital marketing framework that (a) enables digital marketing efforts to be designed and executed in alignment with organizational goals, (b) considers multiple customer touchpoints in the consumer decision-making process, and (c) accounts for the sequential “funnel” nature of the prospect conversion process. We implement this conversion funnel framework at two nonprofit organizations through two field studies and empirically investigate the impact of digital marketing interventions at each stage. In Study 1, we execute the conversion funnel framework to identify the impact of a nonprofit organization’s digital marketing efforts (i.e., specific messaging content, messaging media, and messaging targeting) on bringing prospective customers to their website and encouraging them to complete a purchase. In Study 2, we replicate and extend the framework at another nonprofit organization to investigate the impact of that organization’s marketing interventions (including emails and other contacts with prospects) on driving action. Collectively, the two studies enable us to examine the impact of digital marketing efforts on the stages of the conversion funnel: (a) creating awareness and interest, (b) establishing consideration, and (c) driving action. We find that impressions across various messaging media as well as cross-media synergies are critical to bring prospects to the organization’s landing page. We also find the importance of returning users on the organization’s landing page, in addition to messaging that emphasizes the organization’s parent brand in establishing consideration and encouraging prospects to move forward in the conversion funnel. The organization’s responsiveness to incoming queries, email communications, and other contacts are also important in driving action by prospects. We also demonstrate the success of the in-field implementation of the conversion funnel framework at the respective two nonprofit organizations.

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## **1. Introduction**

The nonprofit sector has been growing over the past decade with more than 10 million nonprofits and non-governmental organizations globally (Conrardy 2020). In the U.S. alone, the number of nonprofits registered with the Internal Revenue Service (IRS) increased by 4.5% from 2006, with approximately 1.54 million nonprofits being registered in 2016 (NCCS 2020). Importantly, the nonprofit sector composed 5.6% of the U.S. GDP, contributing an estimated \$1,047.2 trillion to the U.S. economy in 2016 (BEA 2021). However, nonprofit organizations face critical challenges in acquiring and engaging their customers (including, donors, volunteers, students); for instance, strong competition, limited resources, and changing needs and preferences of target audiences (Notre Dame 2020). To overcome these challenges, nonprofit organizations need to invest in understanding their target audiences and communicating with them effectively. By doing so, nonprofit organizations can establish a unique, preferred position for themselves (as compared to competitors), enabling them to acquire and engage their customers. At the same time, nonprofit organizations can make the most of their limited resources (monetary, human, technological) by ensuring the effectiveness of their marketing mix efforts. To this end, digital marketing provides nonprofit organizations with the ability to communicate with their target audiences and differentiate themselves from the competition in measurable, efficient, and effective ways.

The role of digital marketing has continued to gain prominence, as evidenced by the ongoing academic research on digital marketing (Kannan and Li 2017; Leeftang et al. 2014). Specifically, businesses have recognized the importance of creating digital relationships with customers (Kumar and Mirchandani 2012; Malthouse et al. 2013), and so have nonprofit organizations (Briones et. al 2011; Waters et al. 2009). Accordingly, this has led firms to

leverage the ubiquity of technology to interact and engage with their customers. Despite continued improvements in digital marketing initiatives, organizations are still facing multiple challenges such as (i) addressing changes in consumer preferences as a result of changing demographics in real-time, (ii) navigating the increasing number of digital technologies, and (iii) keeping up with the evolving popularity of social media, among others. The constantly evolving marketplace and increasing complexity of the digital age lead to three types of marketing tensions – business strategy and customer insights, go-to-market implementation, and organizational capabilities (Leeflang et al 2014).

The higher education industry, the focal context of this research, also faces the above-mentioned challenges. According to the Condition of Education Report 2018, enrollment for post-baccalaureate degree programs in the U.S. increased from 2.2 million students in 2000 to 2.9 million in 2010. However, the increase from 2010 to 2016 was minimal – from 2.9 million to 3 million students (McFarland et al. 2018). The absence of a strong upward trend in enrollment statistics was a problem plaguing most graduate schools in the U.S. in 2017 (Okahana and Zhou 2018). However, the falling enrollment rates in U.S. universities may not be because of capacity constraints faced by the universities, but due to a certain perception of the schools (that is not aligned with the intended positioning) among prospective students, and to the imperfect selection criteria applied by schools in admitting students into their programs (Vedder 2018). Therefore, it is important for graduate schools to continuously assess their relevance among the ‘right’ set of students by implementing an effective marketing and communications plan.

Our research is the first to empirically investigate the impact of digital marketing on two nonprofit organizations through two field studies conducted at two educational institutions (universities) in the U.S. We investigate the important challenge of understanding the student

journey in order to better guide universities in identifying and serving their target audience (i.e., students), which can subsequently address the critical challenge of declining enrollment rates. This is expected to enable universities to better administer and manage their graduate programs. In this regard, we develop and implement a conversion funnel framework that can help prepare nonprofit organizations such as universities to better adapt to the evolving expectations of prospects. Contrary to the established practice of using predominantly traditional marketing channels (e.g., billboards, television, print, radio, etc.), alongside a smaller digital presence, the proposed framework places increased emphasis on digital components (e.g., websites, social media), while having a smaller traditional marketing component. We demonstrate that such an approach can enable the nonprofit organization (an educational institution, in this context) to achieve determined outcomes at each stage of the conversion funnel, while reaping the benefits of course-correction in real-time. In an effort to better understand the student journey towards selecting a program of choice, our research addresses the following research questions in the higher education context:

- What specific marketing and communications plans are successful, specifically related to content, messaging, and medium, in the following three stages of the conversion funnel as identified by the educational institutions: (a) bringing prospective students to their websites to seek more information about the graduate programs, (b) encouraging them to create online applications, and (c) driving/converting them to submit the created applications?
- How can success be evaluated at all three stages as identified above?
- What decisions do schools need to make with regard to resource allocation, budget, and timelines in order to enhance their overall performance at all three stages as identified above?

We conduct two field studies at two different educational institutions to examine the impact of digital marketing interventions at each stage of the conversion funnel. In *Study 1*, we develop and implement a conversion funnel framework at one nonprofit organization (a public

university in the U.S.) to identify the impact of specific messaging content, messaging media, and messaging targeting on bringing prospects to the organization's website and encouraging them to create and submit applications. We also evaluate the influence of potential customers' behavior on the organization's website pages. In *Study 2*, we replicate and extend the proposed framework at another nonprofit organization (a private university in the U.S.) to investigate the impact of the organization's marketing interventions such as email communications and offline contacts with potential customers on driving action and find similar success. Together, both studies enable us to study the impact of specific messaging content, messaging media, messaging targeting, email communications, and offline contacts on the three stages of the conversion funnel: (a) creating awareness and interest, (b) establishing consideration, and (c) driving action.

----Insert Figure 1 about here----

As illustrated in Figure 1, the rest of the article is organized as follows. First, we provide a review of related research in digital marketing across industries and in the higher education context. Next, we provide a brief review of the research background to discuss the challenges faced by the educational institutions in our two studies. Then, we review the theoretical foundation that forms the basis of this study and present the implementation of the proposed conversion funnel framework with regard to (a) creating awareness and interest among prospects, (b) establishing consideration and intent among prospects, and (c) driving action towards the specified organizational goal. Then, we delve into *Study 1*, presenting the hypotheses with an empirical examination to test the viability of the proposed framework in a public university. We also present the implementation results of *Study 1*. Later, we replicate and extend the conversion funnel framework in *Study 2*, demonstrating the validity and success of the proposed framework at a private educational institution. Additionally, we examine the

importance of marketing contacts such as emails and contacts in the conversion funnel and present the implementation results of *Study 2*. Finally, we discuss the implications of our findings from *Study 1* and *Study 2* for universities and other nonprofit organizations, identify the limitations of our research, and present avenues for future research.

## **2. Theoretical Background**

### **2. 1. Review of Extant Literature**

The importance of traditional media in driving firm outcomes has been well-documented in academic research (Schultz et al. 1993), while the use of traditional and digital media collectively to yield positive results has been more recently studied (Srinivasan et al. 2016). The use of digital media offers distinct benefits to firms over traditional media and mitigates some of the challenges of using traditional media (Dinner et al. 2014; Stephen and Galak 2012). The use of digital media, however, enables firms to be more precise and targeted in their communications with consumers, which translates to greater efficiency and effectiveness that can be measured and tracked at every stage of the marketing campaign (Kumar and Rajan 2012; Murdough 2009). For instance, media planning for digital media is driven by insights regarding the online actions and behavioral patterns of consumers (Finne and Grönroos 2009). Importantly, the dynamic nature of digital media enables greater responsiveness and interactivity between firm actions and consumer responses (Mangold and Faulds 2009). Additionally, consumers are increasingly tech-savvy and willing to engage with firms via digital media, thus creating a pull force that firms can capitalize on (Kumar and Rajan 2015; Kumar and Ramachandran 2019). While it has been nearly a decade since businesses realized the importance of digital marketing (Wind 2008), only a few studies have applied digital marketing in the higher education context.

Table 1 lists select academic studies in digital marketing that have industry and higher education as the study contexts. Specifically, the first half of the table describes representative studies of digital marketing in business settings, while the second half of the table describes representative studies of digital and social media marketing in the higher education context. For instance, the studies set in the industry context have investigated, among others, the role of digital marketing in (a) measuring the creation and spread of a brand's identity on social media (Kumar et al. 2013), (b) brand-building and customer acquisition efforts (De Vries et al. 2017), (c) customizing websites to drive visit duration (Danaher et al., 2006), and (d) creating better website user experiences leading to final purchase decisions (Bleier et al., 2019). Similarly, in the higher education context, research has examined the influence of social media on student-institution engagement (Peruta and Shields 2017), the role of social media channels in enabling students to make decisions with regard to colleges (Shields and Peruta 2018), and the impact of social media engagement on the quality of student-institution relationships (Clark et al. 2017). However, none of these studies consider the influence of multiple digital channels across multiple touchpoints in the customer journey.

**----Insert Table 1 about here----**

To the best of our knowledge, this research is the first attempt to develop a holistic digital marketing framework that is grounded in a deep understanding of the target audience and demonstrates the achievement of an organization's stated goals at each stage of the conversion funnel through strategic marketing interventions. The proposed conversion funnel framework considers multiple channels such as social media channels (i.e., LinkedIn, Twitter, Facebook, Instagram), Google Search, Google Display, Google Retargeting, and the organization's websites, as well as email communications and offline contacts. In doing so, the framework also

considers multiple customer touchpoints across the decision-making process, enabling the development of a digital marketing approach that is targeted, relevant, and impactful at each stage. The consideration of a wide range of digital channels and multiple customer touchpoints makes this study more comprehensive than earlier studies. Furthermore, the proposed framework considers the communication approach to the prospects (students) on three levels – cognitive, affective, and conative value. Although Bleier et al. (2019) include the cognitive, affective, and conative aspects in their study, the current research has a much broader focus that encompasses multiple channels and multiple stages of the prospects' (student's) decision-making process (application journey).

## **2. 2. Theoretical Foundation**

The hierarchy of effects literature and the adaptive marketing capabilities literature provide a strong theoretical foundation for the proposed conversion funnel. The hierarchy of effects literature aids the conceptualization of the stages of the conversion funnel framework and the development of the messaging content and media (Burnett and Moriarty 1998). The “sense-and-respond” adaptive capability advocated in the marketing capabilities literature is instrumental in the actual implementation of the proposed framework (Day 2011).

### ***2. 2. 1. Hierarchy of Effects Literature***

From a consumer analysis perspective, a marketing strategy is a set of stimuli placed in the consumers' environments that is designed to influence their affect, cognition, and behavior (Peter and Olson 2010). The hierarchy of effects literature includes several communication models based on the assumption that consumers move toward a decision through a step-by-step process influenced by marketing information. In this regard, the hierarchy of effects model continues to

be a major influence in understanding the consumer path to purchase as a predictive sequence of cognition to affect to intention. We briefly discuss four popular communication models.

First, the AIDA (Awareness, Interest, Desire, Action) model describes the impact of marketing as beginning with awareness, evolving to interest, which creates a desire, and finally leading to action (Strong 1925; Leckenby 1976). This early model of the psychology of consumer purchase decision-making has undergone several modifications and is still relevant in the present digital marketplace.

Second, the Think-Feel-Do model proposes the consumer decision-making process as a sequence that begins with the consumer thinking about a marketing cue, developing an opinion or attitude about it, and taking an action or responding to it (Wilkie 1993). This model is most typical of consumers who actively participate in the process of gathering information, which is most likely in case of high-involvement purchases.

Third, the Foote, Cone, and Belding ad agency's FCB model proposes a 2X2 matrix (high- vs. low-involvement purchase decisions and thinking vs. feeling) of consumer responses, product categories, and situations that consist of different orderings of think-feel-do (Vakratsas and Ambler 1999). In this model, the think-feel axis represents the cognitive functions of the consumers as they consider the utilitarian aspects of the offering (think), and the consumer motivations as understood by the offering's value expression (feel). The low-high involvement axis represents the consumer's level of involvement in the purchase decision (do).

Finally, the domains model is based on the principle that marketing communications affect different parts of the mind and heart simultaneously, rather than sequentially (Moriarty 1983). This model measures the effects of perception, education, and persuasion as they correspond to the design of marketing communications.

In order to develop a marketing strategy that is pertinent to nonprofit organizations and reflects the decision-making process of their prospects, we draw on the principles of the aforementioned communication models to develop the conversion funnel framework. Accordingly, the conversion funnel framework is developed as a three-stage model that broadly encompasses awareness and interest, consideration and intent, and action. These stages correspond broadly to the cognitive, affective, and conative effects of marketing communications (Barry and Howard 1990).

### ***2. 2. 2. Adaptive Marketing Capabilities***

Capabilities are “complex models or skills and accumulated knowledge, exercised through organizational processes, that enable firms to coordinate activities and make use of their assets” which are important in the implementation of business processes and have been shown to serve as a source of competitive advantage and profitability for organizations (Day 1994). Research has identified developing static capabilities (Barney 1991) and developing dynamic capabilities (Teece 2009) as two key approaches to manage organizational resources. The static capabilities approach focuses on gaining competitive advantage, while not specifically identifying ways for firm adaptation or evolution (as offered by the resource-based view of the firm). As an advancement, the dynamic capabilities approach discusses how a firm can acquire and deploy its resources to create, extend, or modify its resource base (Helfat 2007). Furthermore, research has established that dynamic capabilities are impacted by an inside-out orientation of the firm (i.e., a perspective that begins within the firm and looks outward to the market). However, from a marketing standpoint, it limits the firm’s ability to detect and respond to immediate market changes (Day 2011). The need for an outside-in orientation (i.e., a perspective that begins with the market and flows inward to the firm) has been advocated that requires the management team

to step outside the firm to understand customer needs (for the purposes of strategy development) (Day 2011).

Adaptive marketing capabilities, in this regard, enable organizations to be sensitive to the emerging trends in the environment, to be agile in rapidly making necessary adjustments in implementation activities, and to be willing to learn through experimentation. The development of adaptive marketing capabilities by a firm is enabled by technological advances, especially with regard to data-driven decision-making, emphasizes an experimental approach to insight generation, and is driven by vigilant market learning (Day 2011). Vigilant market learning involves (a) an outside-in orientation that might require immersion in the lives of past, current, and prospective customers, (b) asking the right questions through multiple inquiry methods with different stakeholders to generate actionable insights, (c) an open-minded approach to identify and act on latent customer needs.

The proposed conversion funnel framework is conceptualized to reflect the needs and behaviors of prospects of nonprofit organizations, based on insights from customers and the members of the nonprofit organizations. Thus, the conversion funnel framework provides an outside-in approach to nonprofit organizations by keeping the prospects at the center of their insight generation and strategy development processes.

Furthermore, the implementation of the conversion funnel framework follows the “sense-and-respond” principle, whereby digital marketing interventions at each stage are crafted and delivered in response to prospects’ behaviors at the preceding stage, and in anticipation of the future. Often, any necessary adjustments to these interventions can be made instantly, in immediate response to the observed behaviors of the prospects, thereby demonstrating agility in digital marketing practices. Thus, the proposed conversion funnel framework presents a digital

marketing strategy that is agile, adaptive, experimental, and broad in scope. Nonprofit organizations are empowered to respond rapidly to take advantage of the opportunities to communicate and engage with prospects (Bughin et al. 2019).

### **3. The Conversion Funnel Framework**

Here, we present the proposed conversion funnel framework that is aimed at guiding the digital marketing strategy of nonprofit organizations toward achieving stated organizational goals. We provide an overview of the theory underlying the development and implementation of the proposed conversion funnel framework. We elaborate on each stage of the conversion funnel framework by defining the aim to be achieved at each stage and identifying the specific digital marketing interventions that can help nonprofit organizations achieve these aims.

#### **3. 1. Developing a Conversion Funnel Framework for Digital Marketing**

In this research, we develop a framework that firms can use to determine the impact of digital marketing efforts on their organizational outcomes at each stage of the conversion funnel. Figure 2 illustrates the generalized form of our conversion funnel framework for nonprofit organizations.

**----Insert Figure 2 about here----**

The conversion funnel framework is uniquely suited to nonprofit organizations because it addresses the main challenges faced by nonprofit organizations, namely – establishing a unique positioning, maintaining clear and consistent messaging, and acquiring and engaging customers (customers could be volunteers, donors, students, depending on the context) within limited resources. The framework begins with the nonprofit organization identifying its target persona and value proposition which is critical to establish a unique identity/positioning amongst competitors. The target persona and value proposition guide the development of a messaging

approach that resonates with the target audience of the organization and is consistent across all digital channels.

To identify the target persona and value proposition, we propose action research to be an ideally suited approach as it integrates the theory-based knowledge of the participating researcher and the experience-based knowledge of the organizational participants (Perry and Gummesson 2004). The participating researcher (internal to or independent of the organization) can conduct an informed investigation into the issue and play an active role with organizational participants in generating actionable outcomes and effecting change within the organization (Harris 2008). Using this action research technique, nonprofit organizations can design their digital messages by considering (a) the content, (b), the media, and (c) the target audiences (i.e., individuals with specific messages from the firm).

Upon determining the above-mentioned three pieces of messaging information, the digital messaging decisions can be directed towards digital marketing initiatives via a three-stage process that aims to achieve specific goals at each stage – creating “awareness and interest” in the organization’s offerings, establishing “consideration and intent” in the offerings, and finally driving “action” towards purchase of the offerings. These three stages also correspond to the cognitive, affective, and conative phases observed in a consumer decision-making process. This framework presents a targeted and data-driven approach for a nonprofit organization to achieve its stated goals within limited resources.

### **3. 2. Implementing the Conversion Funnel Framework**

To implement the proposed framework for its digital marketing initiatives, a nonprofit organization needs to first determine its positioning relative to competition, identify the appropriate target audience for its offerings, and the potential value its offerings present to

prospects. We address this by proposing action research as the first step of the conversion funnel framework.

### ***3. 2. 1. Action Research***

Action research is an informed investigation into a real management issue by a participating researcher who is deeply involved in the issue and plays an active role in coming up with actionable solutions to bring about a change in the organization (Harris 2008). Three levels of researcher participation in action research have been identified – technical, practical, and emancipatory (Carr and Kemmis, 1986). The emancipatory level of participation allows the researcher to become a co-researcher, precisely identify problems and implicit assumptions, and share responsibility for the project with the other participants (Perry and Gummesson 2004).

Action research has been used in studies that require a certain amount of exploratory research involving database marketing (O'Leary et al. 2004). Previously, action research has been applied in studies involving new management accounting practices (Kasanen et al., 1993), risk assessment (Harris, 1999), and IT-enabled organizational change (Scholl 2004). However, action research has been underutilized in developing and implementing marketing strategy so far.

In this research, we demonstrate that action research is particularly valuable to nonprofit organizations as it enables the action researcher(s) to change the context of the problem, present new and improved ways of thinking, and facilitate change within the nonprofit organization (Perry and Gummesson 2004). At the same time, it draws on the expertise, contextual knowledge, experience of the team members of the nonprofit organization, making them participants in the process of creating change within the organization (Brydon-Miller et al., 2003).

### *3. 2. 1. 1. Action Research Methodology.*

In action research, the action researcher becomes involved in the problems faced by the organization and understands the perspectives of various relevant stakeholders. In order to gain an in-depth appreciation of a nonprofit organization's challenges and requirements, target audiences, and value proposition of its offerings, the action researcher works closely with the members of the nonprofit organization. Additionally, the action researcher can gain a comprehensive understanding of the organization's problems based on inputs from prospects and current customers of the nonprofit organization. The action researcher assimilates these perspectives – internal and external – about the organizations problems, brings in theory-based knowledge, and draws on the experience-based knowledge of the organizational members. Based on this, the action researcher develops a target persona and value proposition for the organization's offerings and collaborates with the members of the organization to develop message hierarchies. The action researcher also shares responsibility for the implementation of the conversion funnel framework in the organization.

### *3. 2. 1. 2. Action Research Findings.*

The most important outcome of the action research process is the message hierarchy for the nonprofit organization's offerings. The message hierarchy for an offering is a template that includes the target persona, the core value proposition, and the core messaging theme that the organization needs to communicate. The target persona can be understood as a fictional profile that represents a particular target audience, its characteristics, needs, motivations, behaviors, and environments, and serves as a proxy for the ideal customer at a very personal level. Although fictional, the target persona provides a vivid and specific narrative of an organization's target audience/customer, and can enable marketing managers to understand and empathize with that

target audience (Haas and Kunz 2010). The value proposition for the offering describes, among other details, (a) the salient aspects of the offering, (b) its unique and differentiating features, (c) reasons to choose the offering over comparable alternatives, and (d) the potential benefits of the offering. The messaging hierarchy can be created by a nonprofit organization for each of its offerings, and it enables the development of differentiated messaging content and media, customized to each offering.

### ***3. 2. 2. Digital Messaging Decisions***

Based on these messaging hierarchies, the marketing team of the nonprofit organization can develop the right messaging copies and communicate the right message, to the right audience, at the right time, through the right media. The marketing team can make decisions about the specific messaging copies to be used, the specific digital media to be used to deliver these messaging copies, and the audience profiles that the messaging copies need to target via each medium. Accordingly, several messaging copies are created in each digital medium for the offering. The primary objective of the messaging copies developed at this stage for a specific offering of a nonprofit organization is to create awareness and generate interest about the nonprofit organization and its offering.

### ***3. 2. 3. Creating Awareness and Interest***

At this stage, the nonprofit organization's messaging copies are tactically delivered to capture the attention of the target audience in the most relevant and timely manner. The messaging copies are optimized across various digital media such as display advertising and social media advertising channels. The in-field performance of these messaging copies is evaluated across the various digital media, and decisions are made about continuing or eliminating messaging copies in accordance with the "sense-and-respond" principle. The messaging copy-medium

combinations that are effective and cost-efficient in leading prospects forward in the conversion funnel framework are retained, while ineffective or inefficient combinations are eliminated.

### ***3. 2. 4. Establishing Consideration and Intent***

Having made prospects aware of the nonprofit organization and its offering, the next step is to lead them to the “consideration and intent” stage. At this stage, the objective is to provide them with strong reasons to consider purchasing or buying into the organization’s offering. This stage is typically the most critical and involved since prospects compare and evaluate the nonprofit organization and its offering relative to other alternatives in the same domain. In doing so, they seek out more information about the nonprofit organization, making the organization’s branding and website design and content very important. Brand-focused messaging copies build the brand perception of the organization (parent brand) as well its offering (focal brand) among prospects. In addition, messaging copies that call on prospects to find out more information about the organization and its offering serve to increase prospects’ consideration of the organization’s offering. The content and design of the offering’s website can encourage prospects to explore more details about the offering and include the offering in their consideration set. Thus, prospects display their affective behavior before making their decision and expressing their intent to purchase the organization’s offering.

### ***3. 2. 5. Driving Action***

After prospects give due consideration to the nonprofit organization and express intent to purchase its offering, the next step is to drive them toward acting on this intent. In this stage, the objective is to provide prospects with the information and assistance they need to make the final purchase. This involves presenting an engaging customer journey and the necessary information on the organization’s website to drive a purchase. Furthermore, at this stage, the communications

between the organization and individual prospects play an important role. These include the responsiveness of the organization to incoming queries from prospects as well as email communications to prospects and two-way contacts between the organization and prospects.

#### **4. Study 1**

XYZ Business School (XYZ) offers graduate programs at ABC University (ABC), a large public university in the U.S. Between Fall 2016 and Fall 2017, XYZ observed a significant decline in application submissions (-4.4%) and enrollment (-16.6%). That is, despite available capacity, XYZ identified a declining performance at three critical stages – prospective students visiting the websites for information, creating online applications, and submitting the created applications. Traditionally, and up until 2017, XYZ’s marketing media strategy constituted of nearly 80% traditional media such as print, radio, and local events, with the remaining towards digital marketing. Furthermore, limited measurements were in place to gauge performance effectiveness of the marketing media. In order to tackle these challenges, it was recognized that a more effective approach would be required at XYZ in Fall 2018.

##### **4. 1. Study Objectives**

XYZ’s objectives in Fall 2018 can be succinctly stated as:

- To achieve the goal of 25% increase in graduate enrollment in Fall 2018 over Fall 2017, without any budgetary increase.
- To improve the quality and quantity of prospective students (a) visiting the respective program websites, (b) creating applications, and (c) submitting applications.
- To measure and improve its performance at each stage.

##### **4. 2. Action Research**

###### ***4. 2. 1. Action Research Methodology***

In order to gain a deeper understanding of the concerns faced by XYZ, the research team conducted action research, being closely involved with the graduate program directors to

understand their challenges and requirements. The research team also shared responsibility for directing and executing the transition from traditional to digital marketing at XYZ, thereby making this study an emancipatory level of action research.

The research team conducted in-depth interviews with program directors and faculty, graduate-level students (current and prospective), and executive education program students at XYZ. Reflecting on their experiences with students – prospective, current, and past – the program directors were able to describe their experiences with target audiences in terms of demographics, motivations, digital behavior, and audience stories. Collectively, these insights enabled the research team to develop a target persona for each of the graduate programs at XYZ. Furthermore, the graduate program directors were able to clarify the value propositions of their programs. Using these insights and a keen knowledge of XYZ’s goals and processes, the research team collaborated closely with the program directors to develop message hierarchies for each program.

#### ***4. 2. 2. Action Research Findings***

Based on the insights from the action research process and an understanding of digital marketing and communication, the research team worked closely with the program directors to develop the message hierarchy for each graduate program at XYZ. The message hierarchy for each program includes details about the ideal target prospective student and the core value proposition of the program that the program director needs to communicate. The target persona for each program details the demographics, needs, characteristics, motivations, goals, digital behavior, information sources, and audience stories of the target audience.

The value proposition for each graduate program includes (a) its noteworthy aspects, (b) key differentiating features that sets it apart from other similar programs, (c) reasons to choose

XYZ and the focal program over alternatives, and (d) the potential benefits for students who join the program. The program directors' inputs also provide concrete evidence to support claims about the benefits and successes of their institution's graduate programs. For instance, recruitment statistics, third-party rankings, industry relationships, alignment with industry requirements, student testimonials, and employer quotes for each program are included in the message hierarchy. Based on their experiences, the program directors were able to provide insights regarding the content formats that would most resonate with the target audience.

Appendix A provides a brief understanding of the message hierarchy template that was developed for the graduate programs in *Study 1* based on the action research process. From a managerial perspective, the message hierarchies enabled XYZ's marketing team to identify messaging appeals that would resonate the most with the target persona for each program and develop customized messaging copies based on these appeals. As an example, Appendix B illustrates the message hierarchy developed for the MS Analytics (MSA) program at XYZ. Thus, the message hierarchy for each of the graduate programs at XYZ enabled the creation of engaging digital messaging content and its delivery across relevant digital media.

#### **4. 3. Hypotheses**

Based on the research team's understanding of XYZ's problems and challenges, the conversion funnel framework proposed in Section 3 is found to be an appropriate approach to overcome these challenges and achieve the study objectives. We recognize that the decision-making process of prospective students is a high-involvement, multi-stage process. The conversion funnel framework developed in Section 3 can inform XYZ about the role of marketing messaging in (a) creating awareness about a graduate program, (b) drawing the prospective student's interest, (c) providing information to enable the development of desires,

emotions, and attitudes towards the graduate program, (d), encouraging serious consideration of the graduate program by creating an application, and (e) persuading the prospective student to take action.

As the research team applies the conversion funnel framework at XYZ, we test key hypotheses regarding the in-field execution of the marketing interventions at each stage.

#### ***4.3.1. Creating Awareness and Interest***

We conducted a factor analysis on the impressions on these messaging media (i.e., LinkedIn, Facebook, Twitter, Instagram, and passive Google channels) to identify if they can be grouped into messaging media factors based on similar impression patterns. The results of the factor analysis using Varimax rotation confirmed that these media could be neatly grouped into two factors that cumulatively explained 70.24% of the variance. We named the factor that included LinkedIn and Twitter impressions (average factor loadings  $> 0.85$ ), as “LT Factor”, and the factor that included Instagram, Facebook, and passive Google channels’ impressions (average factor loadings  $> 0.75$ ), as “IFpG Factor”. Given the high factor loadings of impressions on each of the messaging media, we added the impressions on LinkedIn and Twitter for LT Factor, and added the impressions on Instagram, Facebook, and passive Google channels for IFpG Factor.<sup>1</sup> For *Study 1*, we consider the impact of these two messaging media factor impressions and Google Search impressions on creating awareness and interest among the target audiences.

In this stage, the messaging is oriented towards drawing the attention of prospective students to specific programs that would be most relevant to them and appeal to their intrinsic motivations. At XYZ, the messaging content and messaging media selection were designed to generate interest and drive prospective students to the graduate programs’ landing pages to find

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<sup>1</sup> We found similar results by using the factor scores for these two factors.

out more information. At this stage, we expect the number of impressions on each of the messaging media factors to be key drivers of landing page visitors for each of the graduate programs, up to a threshold. Hence,

*Hypothesis 1: The number of impressions on (a) LT Factor (LinkedIn and Twitter), (b) IFpG Factor (Instagram, Facebook, and passive Google channels), and (c) Google Search is positively associated with the number of new users on the landing pages of the programs, up to a threshold (an inverted U-shaped effect).*

We also expect the impressions on these messaging media to interact with each other, creating synergistic effects with regard to bringing new users to the landing pages. Hence,

*Hypothesis 2: The interaction between the number of impressions on LT Factor and the number of impressions on IFpG Factor has a positive impact on the number of new users on the landing pages of the programs.*

*Hypothesis 3: The interaction between the number of impressions on Google Search and the number of impressions on IFpG Factor has a positive impact on the number of new users on the landing pages of the programs.*

*Hypothesis 4: The interaction between the number of impressions on Google Search and the number of impressions on LT Factor has a positive impact on the number of new users on the landing pages of the programs.*

#### **4. 3. 2. Establishing Consideration and Intent**

We expect that having new users visiting the landing page of a program would lead prospective students to seriously consider XYZ's graduate program and express their intent. This will lead to a higher number of applications created. Hence,

*Hypothesis 5: The number of new users on the landing page is positively associated with the number of unique applications created per week.*

We also expect that having a higher number of users returning to the landing page of a program would lead to a higher number of applications created in this stage.

*Hypothesis 6: The number of returning users on the landing page is positively associated with the number of unique applications created per week.*

At this stage, given that the prospective students are likely to be considering several other graduate programs, we expect the brand consideration (XYZ/ABC) of prospective applicants at this stage to contribute to developing a preference for XYZ's programs over other programs in their consideration set. Accordingly, XYZ's marketing team designed its messaging to capitalize on the parent brand which is "ABC University (ABC)" and the focal brand which is "XYZ Business School (XYZ)", and their successes.

*Hypothesis 7: The number of messaging copies highlighting the focal/school brand is positively associated with the number of unique applications created per week.*

*Hypothesis 8: The number of messaging copies highlighting the parent/university brand is positively associated with the number of unique applications created per week.*

The expectation is that the university brand (e.g., ABC) has a higher level of brand awareness and recall, as compared to the sub-brands within the university (e.g., XYZ) (Ali-Choudhury et al. 2008). Consequently, we expect the messages containing the XYZ brand and the messages referencing the ABC brand to interact with each other and have synergistic effects with regard to creating applications. Hence,

*Hypothesis 9: The interaction between the number of messaging copies highlighting the focal/school brand and the number of messaging copies highlighting the parent/university brand has a positive impact on the number of unique applications created per week for the programs.*

To provide prospective students with more reasons to consider XYZ's programs, we expect messages that carry an explicit call to learn more and attend webinars/information sessions to positively influence the creation of applications. However, beyond a certain threshold, we expect the messaging copies with a call to learn more to have a negative effect as a result of overexposure (Pechmann and Stewart 1988). Accordingly,

*Hypothesis 10: The number of messaging copies with a call to learn more about the program is positively associated with the number of unique applications created per week, up to a threshold (an inverted U-shaped effect).*

Furthermore, given that the program pages were designed based on the target audience and the program's value proposition, we expect the average number of program pages per session visited by the new users on the landing page to strengthen (and not dilute) their intent to apply to their program of choice at XYZ. Hence,

*Hypothesis 11: As the average number of program pages visited per session increases, the positive relationship between the number of new users on the landing page and the number of unique applications created per week is strengthened.*

#### **4. 3. 3. Driving Action**

At this stage of the conversion funnel framework, we expect that having more prospective students creating applications for their programs of interest in the previous stage would lead to having more unique applications submitted. That is,

*Hypothesis 12: The number of applications created per week is positively associated with the number of unique applications submitted per week.*

Furthermore, we expect that responding to incoming application-related queries and requests from potential leads by the school's (XYZ's) program coordinators and marketing team would result in more unique applications submitted. Accordingly,

*Hypothesis 13: The number of incoming queries responded to by the school's team is positively associated with the number of unique applications submitted per week.*

In addition, we expect messaging copies with an explicit call to action (i.e., submitting the application) to result in more unique applications submitted. This is because such messaging copies serve as reminders to prospective students that they need to take action with regard to their applications. However, beyond a certain threshold, we expect the messaging copies with a call to action to have a negative effect as a result of overexposure (Tellis 1988).

*Hypothesis 14: The number of messaging copies with a call to action is positively associated with the number of unique applications submitted per week, up to a threshold (an inverted U-shaped effect).*

We also expect the online behavior of prospective students on the program website to influence the submission of unique applications. Specifically, we expect a higher average session duration on the program website with a higher average time spent on the program pages to result in more unique applications submitted. This is because a higher time spent on the program website as a whole and on individual program pages would indicate seriousness and involvement of prospective students with regard to submitting applications. In this regard, we expect the average time spent on the program pages to strengthen the relationship between the average session duration on the program website and the number of unique applications submitted.

Hence,

*Hypothesis 15: The average session duration on program websites is positively associated with the number of unique applications submitted per week.*

*Hypothesis 16: As the average time spent on program pages increases, the positive relationship between the average session duration on program websites and the number of unique applications submitted per week is strengthened.*

We also expect that the number of unique applications submitted per week will be higher than average in the week preceding an admission deadline. We tested these hypotheses during the in-field execution of the conversion funnel framework during the enrollment cycle of Fall 2018. Data was collected and analyzed to identify the influence of key marketing interventions in driving the stated outcomes at each stage of the conversion funnel, finally leading to application submissions. In the following section, we discuss our dataset and variables, and describe the methodology applied to our dataset to answer our research questions.

#### **4. 4. Data Description**

Data for *Study 1* come from the digital marketing campaign executed by XYZ during the application period for Fall 2018 enrollment. The digital campaign ran between February 2018 and August 2018 and data was tracked across eight major graduate programs at XYZ that are

listed in Table 2. Thus, the dataset is panel data with 26 observations at the weekly level during the observation period of February 2018 to August 2018, across eight graduate programs, producing a sample with 208 observations.

----**Insert Table 2 about here**----

The uniqueness of the dataset can be viewed in terms of content, media options, and the target audience, as observed in the following three aspects. First, the dataset contains weekly information on the digital campaigns at the program level for eight major graduate programs offered by XYZ, across seven messaging media. This includes information on the specific ad copies used in the digital campaigns (types of appeals, purpose, and branding), impressions, and leads across four social media channels (LinkedIn, Facebook, Instagram, and Twitter) and three Google channels (search, display, and retargeting).<sup>2</sup> Second, the dataset includes landing page and program website metrics (e.g., program landing page visits, website session details, etc.) for each of the eight graduate programs included in the model that have been captured and recorded on a weekly basis by XYZ’s marketing team. Finally, the dataset also includes the number of applications created and submitted for each of these programs, as recorded on a weekly basis by the college administration. The above mentioned three aspects indicate that this is a first-of-its-kind study to work with granular data, across a range of programs, in a digital marketing environment, powered by relevant marketing messages.

### **Variable Operationalization**

We propose a model consisting of three equations corresponding to the aforementioned three stages - “awareness and interest,” “consideration and intent,” and “action” to explain the impact

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<sup>2</sup> While we have data on clicks, conversion rates, and clickthrough rates for each of the messaging mediums, we do not use them in our model because from a managerial perspective, XYZ had no control over these variables. They are consumer actions. XYZ had control over the number of impressions generated based on the targeting activities for each graduate program.

of XYZ's digital marketing strategy for Fall 2018. Next, we discuss the specific variables used in each of the three equations in our model.

***Dependent Variables:*** We focus on three dependent variables. At the “awareness and interest” stage, we consider the number of new users visiting the landing page as the dependent variable. When a new user visits a program landing page for the first time, he/she receives a cookie with a unique ID linked to his or her IP address, marking him/her as a “new user”. If he/she returns to the site within 30 days of his/her first visit, he/she will be viewed as a “returning user”. However, if a user clears the cookies in his/her web-browsing history and then returns to the website, he/she will be viewed as a new user for the second visit, and not a returning user. Similarly, if a user's first visit is from a desktop browser and his/her subsequent visit is from a mobile browser, he/she will be considered as a new user for the second visit. A user who visits the site 30 days after the first visit is also considered a new user. The aim at this stage is to ensure that XYZ reaches out to as many users as possible (within its target audience) and generate interest among them for each graduate program. To this end, XYZ needs to have prospective students visiting the respective program landing pages that include program information, salient features unique to the program, and links for requesting additional information, starting an application, and exploring the program website. Thus, having new users on the landing pages implies greater awareness and interest being generated by XYZ's digital marketing efforts. Therefore, we focus on new users on the landing page, not returning users as the dependent variable in this stage (Google Analytics Help 2019).

At the “consideration and intent” stage, we consider the number of unique applications created per week as the dependent variable, since creating an application implies a serious consideration of the program as well as the intent to submit an application to be enrolled in

XYZ's graduate program. Creating an application is free of cost, however, the submission of an application requires applicants to pay an application fee.

At the "action" stage, we consider the number of unique applications submitted per week as the dependent variable, since application submission (along with the associated application fees) is the true measure of the prospective student's decision to choose XYZ's graduate program.

***Independent Variables:*** At each of the three stages, we consider multiple marketing interventions by XYZ's marketing team as independent variables which are driven from the theoretical foundation of Think, Feel and Act. Importantly, the predicted dependent variable from the "creating awareness and interest" equation is one of the independent variables for the "establishing consideration and intent" equation, and so forth. Since we are concerned about the organization's decisions in this research, we look at the impact of the organization's marketing interventions at each stage. Given the sequential process in our conversion funnel framework, the outcome at each stage also determines the outcome of the subsequent stage, along with other independent marketing interventions of the organization.

At the "awareness and interest" stage, we consider the following independent variables – (a) LT Factor, (b) IFpG Factor, and (c) the number of impressions on Google Search, and relevant interactions. The impressions on each of the messaging media are expressed in 10,000s.

At the "consideration and intent" stage, we consider the following independent variables – (a) the number of new users on the landing page (predicted from the previous stage), (b) the number of returning users on the landing page, (c) the number of messaging copies with the focal or school brand XYZ, (d) the number of messaging copies with the parent or university brand

ABC, (e) the number of messaging copies with a call to learn more, and (f) the average number of pages per session, and relevant interaction and moderation effects.

At the “action” stage, we consider the following independent variables – (a) the number of unique applications created per week (predicted from the previous stage), (b) the number of incoming queries responded, (c) the number of messaging copies with a call to action, (d) the average time spent on program pages, and (e) the average session duration on program website, and relevant interaction and moderation effects. We also include a dummy variable to account for the expected peak in application submissions before the application deadline (coded as 1 for the week before the application deadline, and 0 otherwise). XYZ had two application deadlines in 2018 – April 1 and June 1. Since April 1 was a Sunday, we code the preceding week as 1, and since June 1 was a Friday, we code that week as 1. Table 3 summarizes the dependent variable and the independent variables at each of the three stages and their operationalization.

----Insert Table 3 about here----

## **4. 5. Methodology**

### ***4. 5. 1. Accounting for Endogeneity***

In our estimation approach, we identified endogeneity concerns in the “awareness and interest” and “action” stages. To account for this endogeneity that can potentially bias the parameter estimates, we consider the instrumental variable approach (Petrin and Train 2010). We use four instruments in the “awareness and interest” stage, and one instrument in the “action” stage. The instruments that satisfy the relevance criterion and the exclusion restriction can be considered as acceptable instruments. The relevance criterion, which relates to the fit of the instrument with the context and the endogenous variable, requires that the instrument is correlated with the

endogenous variable, and the exclusion restriction requires that the instrument is uncorrelated with the dependent variable (Miller and Tucker 2009).

#### *4. 5. 1. 1. Awareness and Interest.*

In the “awareness and interest” stage, LT Factor and IFpG Factor are largely influenced by similar targeting criteria algorithms (e.g., browsing history, and demographic details) decided by the XYZ marketing team. So, we expect LT Factor and IFpG Factor to be endogeneous. To account for this endogeneity, we identify the following instrumental variables that satisfy the relevance criterion and exclusion restriction. Google search impressions, however, are not influenced by these targeting criteria since Google search requires prospective students to input their own search criteria into Google.

For the LT Factor, the instrumental variables are – (a) the number of messaging copies that are aimed at communicating that XYZ’s programs and the students associated with its programs belong to a certain coveted group (i.e., status appeal), and (b) the number of messaging copies containing proof and statistics about XYZ/ABC and XYZ’s programs (statistics appeal). We argue that the messaging copies with these appeals were designed to appeal to the cognitive side of prospective students, by capturing their attention and providing information about XYZ’s graduate programs. While the messaging copies with status appeal communicate that XYZ’s programs and the associated students belong to a certain coveted group, messaging copies with statistics appeal provide factual support such as statistics and rankings.

The action research also identified that when users visit LinkedIn and Twitter, their focus is (a) looking for career opportunities, (b) finding ways of professional development, and (c) seeking information about their professional network. Thus, when users who match the target persona visit LinkedIn and Twitter, they are exposed to messaging copies with status and

statistics appeals that are more likely to resonate with them. The messaging copies with status and statistics appeals are deemed critical and found to be significantly and substantially correlated with the LT Factor, and therefore identified as relevant instruments for the LT Factor.

For the IFpG Factor, the instrumental variables are – (a) the number of messaging copies that appeal to prospective students to achieve their personal goals (personal appeal), and (b) the number of messaging copies that motivate prospective students to be empowered to turn dreams into reality (potential appeal). We argue that the messaging copies with these appeals were designed to capture the attention of prospective students and generate interest in XYZ’s graduate programs. While the messaging copies with personal appeal focus on prospective students achieving their personal goals, messaging copies with statistics appeal highlight the role of XYZ’s graduate programs in helping prospective students expand their horizons.

The action research also identified that when users visit Instagram, Facebook, and when they are exposed to messaging copies on passive Google channels, their focus is on (a) staying updated on developments in their social network, (b) making personal connections, (c) evaluating their activities against that of members in their social network, and (d) browsing content that appeals to them personally. Thus, when users who match the target persona visit Instagram and Facebook, or see display advertisements, they are exposed to messaging copies with personal and potential appeals that are more likely to resonate with them. The messaging copies with personal and potential appeals are important and found to be significantly and substantially correlated with the IFpG Factor, and therefore identified as relevant instruments for the IFpG Factor.

Table 4 illustrates the messaging appeals identified above and provides corresponding examples of messaging copies. While some messages contained multiple appeals, we considered

only the dominant appeal in the message. The identification of the appeals was performed by the research team, and subsequently independently validated with the prior coding performed by the XYZ marketing team. Based on the assessments, we identified the interjudge reliability to be 0.91, above the 0.80 threshold recommended by Kassirjian (1977). Therefore, the appeals identified in Table 4 were verified as appropriate.

**----Insert Table 4 about here----**

Since clicking on the messaging copies (i.e., impressions) is a consumer choice, the messaging copies with the appeals need not be related to the number of new users on the landing page. For instance, a user may match the demographics and behaviors of the target persona for a specific program, and hence be exposed to a messaging copy with the statistics appeal on LinkedIn. Although this user may view the messaging copy, it is not necessary for the user to actually visit the landing page for reasons such as (a) not the right time, (b) no need, (c) already enrolled in another program, among others.

We test for the validity of both sets of instruments empirically. For the LT Factor, the Sargan-Hansen test of over-identifying restrictions indicates a non-significant p-value (p-value > 0.1) for status and statistics appeals, thus failing to reject the null hypothesis of instrument exogeneity. The F-test for weak instrumental variables indicates a significant p-value (F = 20.89; p-value < 0.01), rejecting the null hypothesis of weak instrumental variables for the instruments. Finally, the Durbin-Wu-Hausman test indicates a significant p-value ( $\chi^2 = 38.39$ ; p-value < 0.01) for the instruments, thus rejecting the null hypothesis and suggesting the presence of endogeneity that needs to be corrected for with the instrumental variables. Hence, these instruments are found to be relevant and valid.

For the IFpG Factor, the Sargan-Hansen test of over-identifying restrictions indicates a non-significant p-value (p-value > 0.1) for the instruments, thus failing to reject the null hypothesis of instrument exogeneity. The F-test for weak instrumental variables indicates a significant p-value (F = 17.89; p-value < 0.01), rejecting the null hypothesis of weak instrumental variables for the instruments. Finally, the Durbin-Wu-Hausman test indicates a significant p-value ( $\chi^2 = 72.64$ ; p-value < 0.01) for the instruments, thus rejecting the null hypothesis for the instruments and suggesting the presence of endogeneity that needs to be corrected for with the instrumental variables. Hence, these instruments are found to be relevant and valid.

#### *4. 5. 1. 2. Action.*

In the “action” stage, endogeneity may exist because the number of incoming queries the XYZ marketing team responds to can be simultaneously decided with the number of unique applications created. To correct for this, we use the cumulative number of applications created as an instrumental variable. We argue that the number of incoming queries in a given week (i.e., focal week) is correlated with the total number of applications created in the weeks until the focal week for the following reasons – (a) it is logical that higher the number of applications created, higher the number of application-related queries, and (b) given the specialized nature of the programs, queries tend to be higher as the cumulative number of applications created increases.

We test for the validity of the instrument empirically. We find that the correlation between the number of unique applications submitted per week and the cumulative number of applications created is low. The instrument (cumulative number of applications created) is significantly correlated with the total number of incoming queries. The F-test for weak

instrumental variables indicates a significant p-value ( $F = 38.45$ ,  $p\text{-value} < 0.01$ ), rejecting the null hypothesis of weak instrumental variables. The Durbin-Wu-Hausman test indicates a significant p-value ( $\chi^2 = 29.87$ ,  $p\text{-value} < 0.01$ ), thus rejecting the null hypothesis, and suggesting the presence of endogeneity that needs to be corrected for with the instrumental variable.

#### **4. 5. 2. Model**

The three-equation model is presented below. Equation 3 corresponds to the “awareness and interest” stage, equation 4 corresponds to the “consideration and intent” stage, and equation 6 corresponds to the “action” stage for the  $j^{\text{th}}$  program in the  $t^{\text{th}}$  week. To determine whether a program-level random or fixed effects specification is appropriate for each of the three modeling stages, we run the equation corresponding to each stage with a random effects specification and conduct the Hausman test. In each of the equations corresponding to the three stages, the null hypothesis was not rejected, indicating that the random effects specification is the appropriate one. The Hausman test was not significant for the “awareness and interest” stage ( $\chi^2 = 0.17722$ ,  $p\text{-value} = 0.9812$ ), the “consideration and intent” stage ( $\chi^2 = 0.14813$ ,  $p\text{-value} = 0.7003$ ), and the “action” stage ( $\chi^2 = 2.1998$ ,  $p\text{-value} = 0.138$ ). Since all three dependent variables are truncated at 0, we use a log transformation [ $\log(1 + Y)$ ] of all three dependent variables.

To account for endogeneity in the “awareness and interest” stage, we conduct a first-stage regression using the instrumental variables that we identified. For the LT Factor, the instrumental variables are the number of messaging copies with status appeal and the number of messaging copies with statistics appeal. For the IFpG Factor, the instrumental variables are messaging copies with personal appeal and messaging copies with potential appeal. The first-stage equations for these endogenous variables are expressed as:

$$(1) \text{litwimp}_{jt} = \alpha_1 \text{statusappeal}_{jt} + \alpha_2 \text{statappeal}_{jt} + \eta_{1jt}$$

where,

*litwimp* = LT factor (number of impressions on LinkedIn and Twitter)

*statusappeal* = number of messaging copies with status appeal

*statappeal* = number of messaging copies with statistics appeal

$\eta_{1jt}$  = random error for equation 1

*j* = program

*t* = week

$$(2) \text{igfbgpassimp}_{jt} = \alpha_3 \text{perappeal}_{jt} + \alpha_4 \text{potappeal}_{jt} + \eta_{2jt}$$

where

*igfbgpassimp* = IFpG Factor (number of impressions on Instagram, Facebook, and passive Google channels)

*perappeal* = number of messaging copies with personal appeal

*potappeal* = number of messaging copies with potential appeal

$\eta_{2jt}$  = random error for equation 2

*j* = program

*t* = week

As discussed earlier, these instrumental variables in each of the first-stage models in Equations 1 and 2 satisfy the relevance criterion and exclusion restriction. The residuals from Equations 1 and 2 were used as additional explanatory variables (*litwimp\_residual<sub>jt</sub>* and *igfbgpassimp\_residual<sub>jt</sub>*) in Equation 3 that corresponds to the “awareness and interest” stage.

$$(3) \log(\text{landusers})_{jt} = \beta_{0j} + \beta_1 \text{litwimp}_{jt} + \beta_2 \text{igfbgpassimp}_{jt} + \beta_3 \text{gsimp}_{jt} + \beta_4 \text{litwimp}_{jt}^2 + \beta_5 \text{igfbgpassimp}_{jt}^2 + \beta_6 \text{gsimp}_{jt}^2 + \beta_7 \text{litwimp}_{jt} * \text{igfbgpassimp}_{jt} + \beta_8 \text{gsimp}_{jt} * \text{igfbgpassimp}_{jt} + \beta_9 \text{gsimp}_{jt} * \text{litwimp}_{jt} + \beta_{10} \widehat{\eta}_{1jt} + \beta_{11} \widehat{\eta}_{2jt} + \epsilon_{1jt}$$

where

*landusers* = number of new users on the landing page

*litwimp* = LT factor (number of impressions on LinkedIn and Twitter)

*igfbgpassimp* = IFpG Factor (number of impressions on Instagram, Facebook, and passive Google channels)

*gsimp* = number of impressions on Google Search

$\widehat{\eta}_{1jt}$  = LT Factor endogeneity correction term (residuals from the first-stage regression in Equation 1)

$\widehat{\eta}_{2jt}$  = IFpG Factor endogeneity correction term (residuals from the first-stage regression in Equation 2), and

$\epsilon_{1jt}$  = random error for equation 3.  $\epsilon_{1jt}$  is modeled as a function of past errors to capture any persistence effects.

*j* = program

*t* = week

We do not have an endogeneity concern in the “consideration and intent” stage, so we do not need to use instrumental variables in this stage. Equation 4 corresponds to this stage.

$$(4) \log(\text{appcrunique})_{jt} = \beta_{12j} + \beta_{13} \log(\widehat{\text{landnusers}})_{jt} + \beta_{14} \text{landretusers}_{jt} + \beta_{15} \text{brandXYZ}_{jt} + \beta_{16} \text{brandABC}_{jt} + \beta_{17} \text{info}_{jt} + \beta_{18} \text{info}^2_{jt} + \beta_{19} \text{progpps}_{jt} + \beta_{20} \text{brandXYZ}_{jt} * \text{brandABC}_{jt} + \beta_{21} \log(\widehat{\text{landnusers}})_{jt} * \text{progpps}_{jt} + \epsilon_{2jt}$$

where

*appcrunique* = number of unique applications created per week

$\log(\widehat{\text{landnusers}})$  = predicted number of new users on the landing page (from Equation 3)

*landretusers* = number of returning users on the landing page

*brandXYZ* = number of messaging copies with brand XYZ

*brandABC* = number of messaging copies with brand ABC

*info* = number of messaging copies with an explicit call to learn more

*progpps* = average number of program pages per session, and

$\epsilon_{2jt}$  = random error for equation 4.  $\epsilon_{2jt}$  is modeled as a function of past errors to capture any persistence effects.

*j* = program

*t* = week

To account for endogeneity in the “action” stage, we conduct a first-stage regression using the cumulative number of applications created as the instrumental variable. The first-stage equation for the total number of incoming queries is expressed as:

$$(5) \text{totalleads}_{jt} = \alpha_5 \text{appcrum}_{jt} + \eta_{3jt}$$

where

*appsubunique* = number of unique applications submitted per week

*appcrum* = cumulative number of applications created until week *t*

$\eta_{3jt}$  = random error for equation 5

*j* = program

*t* = week

As discussed earlier, the instrumental variable in Equations 5 satisfies the relevance criterion and exclusion restriction. The residual from Equation 5 was used as an additional explanatory variable (*totalleads\_residual<sub>jt</sub>*) in Equation 6 that corresponds to the “action” stage.

$$(6) \log(\text{appsubunique})_{jt} = \beta_{22j} + \beta_{23} \log(\widehat{\text{appcrunique}})_{jt} + \beta_{24} \text{totalleads}_{jt} + \beta_{25} \text{cta}_{jt} + \beta_{26} \text{cta}^2_{jt} + \beta_{27} \text{progsessdur}_{jt} + \beta_{28} \text{progtop}_{jt} + \beta_{29} \text{progsessdur}_{jt} * \text{progtop}_{jt} + \beta_{30} \widehat{\eta}_{3jt} + \beta_{31} \text{weekdummy}_{jt} + \epsilon_{3jt}$$

where

*appsubunique* = number of unique applications submitted per week

$\log(\widehat{appcrunique})$  = predicted number of unique applications created per week (from Equation 4)  
 $totalleads$  = number of incoming queries responded by XYZ marketing team  
 $cta$  = number of messaging copies with an explicit call to apply  
 $progtop$  = average time on program pages  
 $progsessdur$  = average session duration on program website, and  
 $\widehat{\eta}_{3jt}$  = Incoming queries endogeneity correction term (residuals from the first-stage regression in Equation 5),  
 $weekdummy$  = dummy variable to indicate week preceding (when April 1 is the application deadline) and week of (when June 1 is the application deadline) application deadline  
 $\epsilon_{3jt}$  = random error for equation 6.  $\epsilon_{3jt}$  is modeled as a function of past errors to capture any persistence effects.  
 $j$  = program  
 $t$  = week

The three main equations (3, 4, and 6) can be estimated individually given the sequential process and the use of predicted values of the previous stage dependent variables. However, the inherent sequential student journey discussed earlier can make the errors to be correlated. This occurs because two of the three dependent variables (the landing page new users and the number of unique applications created) are explanatory variables in the subsequent stage equation. Therefore, we estimate these three equations as a system of equations using a seemingly unrelated regression (SUR) estimation approach (Zellner 1962). Thus, the system of equations consists of three equations corresponding to the three stages – Equations 3, 4, and 6. We also estimate these three equations (3, 4, and 6) individually, and find similar results as the SUR estimation. The error terms are bootstrapped to account for the control function approach in our analyses.

## 4. 6. Results

### 4. 6. 1. First-stage Estimation Results

The results of the first-stage models in Equations 1 and 2 provide a better understanding of the impact of messaging appeals on the LT Factor, and the IFpG Factor. As hypothesized, the LT Factor increases with (a) an increase in the number of messaging appeals with status appeal ( $\alpha_1 =$

936.8,  $p < 0.01$ ), and (b) an increase in the number of messaging appeals with statistics appeal ( $\alpha_2 = 4745.7, p < 0.01$ ). This indicates that both these messaging appeals are important in determining the LT Factor. The IFpG Factor increases with (a) an increase in the number of messaging appeals with personal appeal ( $\alpha_3 = 3839.6, p < 0.01$ ), and (b) an increase in the number of messaging appeals with potential appeal ( $\alpha_4 = 892.1, p < 0.05$ ). This indicates that these messaging appeals are important in determining the IFpG Factor.

In Equation 5, the number of total incoming queries increases with an increase in the cumulative number of applications created ( $\alpha_5 = 0.04716, p < 0.01$ ). This indicates that the cumulative number of applications created has an impact on the number of incoming queries responded by XYZ.

#### **4. 6. 2. Main Model Estimation Results**

Appendix C includes the descriptive statistics and correlation matrix for the data. We present the results of our estimated models for each of the three stages in Table 5.

----Insert Table 5 about here----

##### *4. 6. 2. 1. Awareness and Interest.*

As mentioned earlier, the impressions on each of the messaging media in Equation 3 are scaled by expressing each variable in 10,000s. We find a significant positive relationship between the LT Factor and the number of new users on the landing page ( $\beta_1 = 0.2091, p < 0.01$ ). There is a significant negative relationship between (LT Factor)<sup>2</sup> and the number of new users on the landing page ( $\beta_4 = -0.00701, p < 0.01$ ). This implies that an increase in the LT Factor leads to an increase in the number of new users on the landing page up to a threshold, beyond which an increase in the LT Factor leads to a declining number of new users on the landing pages. Thus, Hypothesis 1a is supported.

There is also a significant positive relationship between the IFpG Factor and the number of new users on the landing page ( $\beta_2 = 0.08013, p < 0.01$ ). There is a significant negative relationship between (IFpG Factor)<sup>2</sup> and the number of new users on the landing page ( $\beta_5 = -0.001503, p < 0.05$ ). This implies that an increase in the IFpG Factor leads to an increasing number of new users on the landing page up to a threshold, beyond which an increase in the IFpG Factor leads to a declining number of new users on the landing pages. Thus, Hypothesis 1b is supported.

There is a significant positive relationship between Google search impressions and the number of new users on the landing page ( $\beta_3 = 2.167, p < 0.01$ ). There is a significant negative relationship between (Google search impressions)<sup>2</sup> and the number of new users on the landing page ( $\beta_6 = -0.3122, p < 0.01$ ). This implies that an increase in the number of impressions on Google search leads to an increase in the number of new users on the landing page, up to a threshold, beyond which an increase in Google search impressions leads to a declining number of new users on the landing pages. So, Hypothesis 1c is supported. Thus, we notice a saturation effect with regard to the number of impressions across these messaging media. Managerially, this indicates that beyond a point, multiple exposures to media impressions will result in a decline in the number of users on the landing pages.

We find significant positive relationships for the hypothesized cross-media synergistic effects. Results indicate cross-media synergies between the LT Factor and the IFpG Factor on the number of new users on the landing page ( $\beta_7 = 0.003662, p < 0.01$ ). Figure 3. 1 illustrates the total effect size of the interaction between the LT Factor and the IFpG Factor. This implies that the interaction between the LT Factor and the IFpG Factor has a positive impact on bringing new users to the landing page. Thus, we find support for Hypothesis 2. We find significant cross-

media synergies between Google search impressions and the IFpG Factor ( $\beta_8 = 0.01193, p < 0.01$ ), thus supporting Hypothesis 3. Figure 3. 2 illustrates the total effect size of the interaction between Google search impressions and the IFpG Factor. Similarly, significant positive cross-media synergies are observed between Google search impressions and the LT Factor ( $\beta_9 = 0.03252, p < 0.01$ ). Figure 3. 3 illustrates the total effect size of the interaction between Google search impressions and the LT Factor. Thus, Hypothesis 4 is supported.

----Insert Figures 3. 1, 3. 2, and 3. 3 about here----

#### 4. 6. 2. 2. *Consideration and Intent.*

In Equation 4, we find a significant positive relationship between the predicted number of new users on the landing page and the number of unique applications created per week ( $\beta_{13} = 0.07315, p < 0.01$ ). Thus, Hypothesis 5 is supported. We also find a significant positive impact of returning users on the number of unique applications created per week ( $\beta_{14} = 0.005835, p < 0.05$ ), thus supporting Hypothesis 6.

We find a significant positive relationship between the number of messaging copies with the focal/school brand XYZ and the number of unique applications created per week ( $\beta_{15} = 0.005714, p < 0.01$ ). Thus, Hypothesis 7 is supported. Furthermore, a significant positive relationship is observed between the number of messaging copies with parent/university brand ABC and the number of unique applications created per week ( $\beta_{16} = 0.30715, p < 0.01$ ), thereby supporting Hypothesis 8.

Importantly, the interaction of the number of messaging copies with brand XYZ and the number of messaging copies with brand ABC has a significant positive impact on the number of unique applications created per week ( $\beta_{20} = 0.0056097, p < 0.01$ ). Figure 3. 4 illustrates the total effect size of the interaction between the number of messaging copies with brand XYZ and the

number of messaging copies with brand ABC. Thus, we observe a synergy effect whereby having a variety of messaging copies that individually highlight the ABC brand as well as the XYZ brand in a given week, encourages prospective students to create applications. This finding is in line with prior research in digital marketing that has observed synergy effects (Naik and Peters 2009). Hence, we find support for Hypothesis 9.

----Insert Figure 3. 4 about here----

We find a significant positive relationship between the number of messaging copies with a call to learn more and the number of unique applications created ( $\beta_{17} = 0.0083, p < 0.05$ ). However, there is no significant saturation effect observed for the (number of messaging copies with a call to learn more)<sup>2</sup>. Hence, we find only partial support for Hypothesis 10. This could possibly mean that unlike traditional media, digital messaging copies with a call to learn more about graduate programs do not have an overexposure effect on the prospective students.

Finally, the average number of program pages per session has a positive moderating effect on the relationship between the number of new users on the landing page and the number of unique applications created per week ( $\beta_{21} = 0.004062, p < 0.05$ ). Figure 3. 5 illustrates the total effect size of the moderation effect of the average number of program pages per session. This implies that as the average number of program pages per session increases, the positive relationship between new users on the landing page and the number of applications created is strengthened. Thus, we find support for Hypothesis 11.

----Insert Figure 3. 5 about here----

#### 4. 6. 2. 3. Action.

In Equation 6, the predicted number of unique applications created per week shows a significant positive relationship with the number of unique applications submitted per week ( $\beta_{23} = 0.74943,$

$p < 0.01$ ), thereby supporting Hypothesis 12. We also find a significant positive relationship between the number of incoming queries responded by XYZ marketing team and the number of unique applications submitted per week, underlining its importance in driving application submission ( $\beta_{24} = 0.015154$ ,  $p < 0.01$ ), thereby supporting Hypothesis 13.

We observe a significant positive relationship between the number of messaging copies with a call to action and the number of unique applications submitted per week ( $\beta_{25} = 0.0125$ ,  $p < 0.01$ ). However, there is no significant saturation effect observed for the (number of messaging copies with a call to action)<sup>2</sup>. Thus, we find partial support for Hypothesis 14. This could possibly mean that unlike traditional media, digital messaging copies with a call to action about graduate program do not have an overexposure effect on the prospective students.

There is no significant relationship between the average session duration on the program website and the number of unique applications submitted per week. Thus, we do not find support for Hypothesis 15. The average duration of sessions on the program website may not be indicative of the application submission decisions of prospective students. This may be because prospective students prefer communicating directly with the XYZ team with regard to application and program-related queries and requests.

However, the average time spent on program pages has a positive moderating effect on the relationship between the average session duration on the program website and the number of unique applications submitted per week ( $\beta_{29} = 0.0000053424$ ,  $p < 0.01$ ). Figure 3. 6 illustrates the total effect size of the moderation effect of the average time spent on program pages. This implies that as the average time spent on program pages increases, the relationship between the average session duration on the program website and the number of unique applications submitted per week is strengthened. Hence, we find support for Hypothesis 16. Finally, the week

dummy shows a significant positive relationship with the number of unique applications submitted per week ( $\beta_{31} = 0.74439, p < 0.01$ ), confirming that there is a peak effect which has been captured.

----Insert Figure 3. 6 about here----

#### **4. 7. Implementation Results**

The implementation of the proposed conversion funnel framework in XYZ resulted in an improvement for Fall 2018 (over Fall 2017) across all the three stages of the conversion funnel – prospective students visiting the websites for information, creating online applications, and submitting the created applications. First, the results indicate that visits to the program websites’ pages increased by more than 500%, while the website engagement rate increased by 18.1% (measured as a reduction in website bounce rate). This indicates the success of the conversion funnel framework in targeting the right audience with the relevant message. Second, the number of applications created increased by 50%. Based on *Study 1*, we identify that messaging copies emphasizing brand XYZ and brand ABC are important factors that influence prospective students to create applications. Third, the number of applications submitted increased by 57%. Through appropriate targeting and instrumented digital marketing interventions, XYZ ensured that prospective students who enter the top of the funnel as new users on the landing page continue on to create applications, engage with XYZ to complete and finally submit their applications. Overall, whereas XYZ wanted to enroll 600 students for Fall 2018 (an increase of 25% over Fall 2017), the implementation of the conversion funnel framework resulted in the enrollment of 618 students (an increase of 28%). The over-achievement of the target enrollment was possible through the efficiency and effectiveness of the proposed framework. To the best of our knowledge, no educational institution has previously attempted or achieved this level of

performance, at this speed, and with no incremental marketing spend. Thus, the conversion funnel framework succeeds in achieving XYZ's enrollment goal by improving outcomes at each stage, enabled by the measurement and real-time adjustment of digital marketing interventions.

#### **4. 8. Limitations**

*Study 1* has two main limitations. We do not consider email marketing and other communications that typically occur between prospective students and the marketing teams or program coordinators. The inclusion of marketing contacts such as email communications, phone calls, other events, etc. between the XYZ/ABC and prospective students can provide more nuanced insights and managerial implications. Furthermore, in *Study 1* we demonstrate the performance enhancement that XYZ observed as a result of the implementation of the conversion funnel framework. However, this alone does not provide enough evidence that these results can be achieved at other higher education institutions as well as other nonprofit organizations by applying the conversion funnel framework. Replicating this study at other nonprofit organizations will help validate the conversion funnel framework and ensure generalizability. Further studies can address these limitations.

#### **5. Study 2**

STU Business School (STU) offers graduate programs at DEF University (DEF), a private university in the U.S. Between January-December 2017 and January-December 2018, STU observed a significant decline in application submissions (-10.23%) and enrollment (-7.14%). That is, despite available capacity, STU identified a declining performance at three critical stages – prospective students visiting the websites for information, creating online applications, and submitting the created applications. Traditionally, and up until 2019, STU's marketing media strategy constituted 50% traditional media such as print, radio, and local events, with the

remaining towards digital marketing. Although the marketing strategy of STU included digital media in a substantial way, it is important to note that only one messaging copy was used for each program and the only digital medium used was Google Display advertising. Furthermore, limited measurements were in place to gauge performance effectiveness of the marketing media. A more effective approach would be required to address these challenges in 2019.

## **5. 1. Study Objectives**

STU's objectives in 2019 can be stated as:

- To stop the decline in student enrollment and begin to achieve growth in graduate enrollment in 2019 over 2018, without any budgetary increase.
- To improve the quality and quantity of prospective students (a) visiting the respective program websites, (b) creating applications, and (c) submitting applications.
- To receive applications from students who are within the target audience of STU's various graduate programs and meet STU's standards. Admitting students who align with the goals and standards of STU's programs can serve to ensure that these students succeed in STU's programs and derive the full benefits of the STU/DEF experience.
- To measure and improve its performance at each stage.

## **5. 2. Action Research**

### ***5. 2. 1. Action Research Methodology***

In an effort to fully understand STU's challenges, the research team conducted action research at STU following the same methodology as in *Study 1*. The research team assimilated insights from in-depth interviews with program directors and faculty, current and prospective graduate-level students, and an understanding of STU's goals and processes. Based on these insights, the research team worked closely with the program directors to develop message hierarchies for each program, including the target personas and the value propositions for each of the graduate programs at STU. The target personas and value propositions for the graduate programs contained the same types of information as those in *Study 1*.

### **5. 2. 2. Action Research Findings**

The message hierarchies created for each graduate program enabled STU's marketing team to clarify the specific messaging appeals that would resonate with the target persona for the program and guided the development of customized messaging copies based on these appeals. As in *Study 1*, the message hierarchy for each of the graduate programs enabled STU to create digital messaging content appropriate to the target audience and provided direction to its dissemination across relevant digital media.

### **5. 3. Hypotheses**

Based on the research team's understanding of STU's key concerns and challenges, the conversion funnel framework proposed in Section 3 is viewed as an appropriate approach to achieve the study objectives. As the research team applies the conversion funnel framework at STU, we test key hypotheses regarding the in-field execution of the marketing interventions at each stage. It is important to note here that the application of the conversion funnel framework at STU in *Study 2* is similar to that at XYZ in *Study 1*. So, most of the marketing interventions executed in *Study 2* and their associated hypotheses are the same as in *Study 1*. In the following sections, we provide details on *Study 2*, highlighting the aspects of the execution of marketing interventions that are different at STU in comparison to XYZ.

#### **5. 3. 1. Creating Awareness and Interest**

As in *Study 1*, the messaging copies were optimized across seven digital media channels in *Study 2* at STU – LinkedIn, Facebook, Twitter, Instagram, passive Google channels, and Google Search in order to achieve create awareness and generate interest about the graduate programs. The results of a factor analysis using Varimax rotation showed that the aforementioned media could be grouped into two factors that cumulatively explained 53.6% of the variance. The factor

“LT Factor” included LinkedIn and Twitter impressions (average factor loadings  $> 0.73$ ) and the “IFpG Factor” factor included Instagram, Facebook, and passive Google channels’ impressions (average factor loadings  $> 0.62$ ). Accordingly, we added the impressions on LinkedIn and Twitter for LT Factor, and added the impressions on Instagram, Facebook, and passive Google channels for IFpG Factor.<sup>3</sup> For our analysis, we consider the impact of these two messaging media factor impressions and Google Search impressions on creating awareness and interest among the target audiences.

In this stage, the goal of the messaging content and messaging media is to create interest among prospective students and leading them to the landing pages of the graduate programs. We execute the marketing interventions at the awareness and interest stage from *Study 1* at STU in *Study 2* and expect them to have a similar impact on bringing new users to the landing pages of STU’s graduate programs. Hence, the hypotheses that are tested at this stage at STU are the same as the hypotheses that are tested at XYZ in *Study 1*. Thus, at this stage in *Study 2*, we test Hypotheses 1 through 4 as described in Section 4.3.1.

### **5.3.2. Establishing Consideration and Intent**

At this stage, among other marketing interventions, STU’s marketing messaging was designed to focus on the “DEF University (DEF)” and “STU Business School (STU)” brands. The expectation is that the university brand (DEF) has higher brand awareness and recall as compared to the sub-brands within the university (STU) (Ali-Choudhury et al. 2008). So, we expect positive synergies between the messages highlighting the DEF brand and the messages highlighting the STU brand, with regard to creating applications. Prospective students are likely

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<sup>3</sup> We found similar results by using the factor scores for these two factors.

to have several other graduate programs and other universities in their consideration set so brand-focused messaging is expected to encourage them to create applications for STU's programs.

In this stage, the goal of the messaging content and messaging media is to create interest among prospective students and leading them to the landing pages of the graduate programs. The marketing interventions from the consideration and intent stage in *Study 1* are also executed at STU in *Study 2*. We expect these interventions to have a similar impact on encouraging prospective students to create applications for STU's graduate programs. Hence, the hypotheses that are tested at this stage at STU are similar to the hypotheses that are tested at XYZ in *Study 1*. Thus, at this stage in *Study 2*, we test Hypotheses 5 through 11 as described in Section 4.3.2.

### **5.3.3. Driving Action**

At this stage, the aim is to drive prospective students toward submitting their applications for STU's graduate programs. The marketing interventions from the action stage in *Study 1* are also executed at STU in *Study 2*. We expect these interventions to have a similar impact on encouraging prospective students to create applications for STU's graduate programs. Hence, the hypotheses that are tested at this stage at STU are the same as the hypotheses that are tested at XYZ in *Study 1*. Thus, at this stage in *Study 2*, we test Hypotheses 12 through 16 as described in Section 4.3.3. Additionally, we consider the impact of email communications from STU to prospective students and the contacts between STU and prospective students.

The email communications sent to prospective students were personalized to each individual student based on the interest demonstrated towards a particular graduate program, their demographic profile, their behavior on the program website, and their incoming queries to the marketing team. So, we expect that when a prospective student who has created an application clicks on personalized emails from STU's marketing team, the content of these

emails will enhance and strengthen the prospective student's decision to submit the application for the chosen program. Hence,

*Hypothesis 17: As the number of emails clicked on per week increases, the positive relationship between the number of unique applications created per week and the number of unique applications submitted per week is strengthened.*

Contacts (e.g., phone calls, voicemails, specific information provided, on/off-campus events, test scores received, information provided, etc.) between prospective students and STU's program coordinators and marketing team provide personally relevant information, clarity, and guidance to prospective students as they move toward application submission. Hence, these contacts between prospective students who have created applications and the school's (STU's) team are expected to provide the necessary information and enhance the students' earnestness to submit applications. At this stage in *Study 2*, we include the following hypothesis,

*Hypothesis 18: As the number of contacts per week (between prospective students and the school's team) increases, the positive relationship between the number of unique applications created per week and the number of unique applications submitted per week is strengthened.*

Thus, we extend the framework that is applied and tested in *Study 1*. We tested Hypotheses 1 through 18 during the in-field execution of the conversion funnel framework at STU. We collected and analyzed the data to identify the influence of key marketing interventions in driving the stated outcomes at each stage of the conversion funnel, as in *Study 1*. In the following section we discuss our dataset and variables for *Study 2*, and describe the methodology applied to our dataset to replicate and extend *Study 1*.

#### **5. 4. Data Description**

Data for *Study 2* come from the digital marketing campaign executed by STU for its 2019 graduate program admissions. The digital campaign ran between January and December 2019. The data was tracked across eight major graduate programs at STU that are listed in Table 2.

Thus, our dataset is panel data with 52 observations at the weekly level during the observation period for our dataset is January to December 2019, across twelve graduate programs, producing a sample with 624 observations.

The dataset for *Study 2* includes the three aspects that are included in XYZ’s dataset from *Study 1*. That is, the dataset for *Study 2* includes (i) weekly information on the specific ad copies used in the digital campaigns at the program level for twelve major graduate programs offered by STU, across seven messaging media, (ii) weekly information on the landing page and program website metrics at the program level, and (iii) weekly information on the number of applications created and submitted for each program. Additionally, the dataset for *Study 2* includes information on emails sent by STU to prospective students and contacts (such as phone conversations, specific information provided, on/off-campus events) between prospective students and STU.

### **Variable Operationalization**

In *Study 2*, we propose and test the same three-stage model as in *Study 1*. The model consists of three equations corresponding to the aforementioned three stages - “awareness and interest,” “consideration and intent,” and “action” to explain the impact of STU’s digital marketing strategy. Hence, the specific variables and their operationalization that are used in *Study 1* are also used in *Study 2*. However, since we include two additional marketing interventions – emails and contacts – in the “action” stage, we describe these new independent variables in greater detail below.

***Independent Variables:*** At the “action” stage for *Study 2*, we consider the following additional independent variables – (a) the number of emails clicked on per week and (b) the number of contacts between prospective students and STU per week at the program level.

Table 3 summarizes the dependent variable and the independent variables at each of the three stages and their operationalization in *Study 2*. As in *Study 1*, we include a dummy variable to account for the expected peak in application submissions before application deadlines. STU had multiple varying application deadlines in 2019 for its various graduate programs, which were coded as in *Study 1*. The predicted dependent variable from the “creating awareness and interest” equation is included as an independent variable for the “establishing consideration and intent” equation, and so forth, as in *Study 1*.

## **5. 5. Methodology**

### ***5. 5. 1. Accounting for Endogeneity***

In our estimation approach for *Study 2*, we identify endogeneity concerns in the “awareness and interest” and “action” stages and account for this by considering the instrumental variable approach (Petrin and Train 2010). We use four instruments in the “awareness and interest” stage, and one instrument in the “action” stage, similar to the approach followed in *Study 1* and test for the validity of both sets of instruments empirically.

#### ***5. 5. 1. 1. Awareness and Interest.***

In the “awareness and interest” stage, we expect LT Factor and IFpG Factor to be endogeneous. To account for this endogeneity, we identify the following instrumental variables that satisfy the relevance criterion and exclusion restriction.

For the LT Factor, the instrumental variables are – (a) the number of messaging copies that are aimed at communicating that STU’s programs and the students associated with its programs belong to a certain coveted group (i.e., status appeal), and (b) the number of messaging copies containing proof and statistics about STU/DEF and STU’s programs (statistics appeal).

The rationale to explain the relevance of these instruments is as explained in Section 4. 4. 1. 1 of

*Study 1* and is supported by findings from the action research conducted at STU in *Study 2*. The messaging copies with status and statistics appeals are also found to be significantly and substantially correlated with the LT Factor, and therefore identified as relevant instruments.

For the IFpG Factor, the instrumental variables are – (a) the number of messaging copies that appeal to prospective students to achieve their personal goals (personal appeal), and (b) the number of messaging copies that motivate prospective students to be empowered to turn dreams into reality (potential appeal). The rationale to explain the relevance of these instruments is as explained in Section 4. 4. 1. 1 of *Study 1* and is supported by findings from the action research conducted at STU in *Study 2*. The messaging copies with personal and potential appeals are found to be significantly and substantially correlated with the IFpG Factor, and therefore identified as relevant instruments.

The description and coding of the messaging appeals identified above is as followed in *Study 1*. The identification of the appeals was performed the research team, and independently validated with the STU marketing team's prior coding. The interjudge reliability is found to be 0.88, therefore, the appeals identified here were verified as appropriate.

As mentioned in *Study 1*, clicking on the messaging copies (i.e., impressions) is a consumer choice, and there are multiple reasons for a user viewing a certain messaging copy but not visiting the landing page. So, the messaging copies with the appeals need not be related to the number of new users on the landing page.

We also find empirical support for the validity of both sets of instruments. For the LT Factor, the Sargan-Hansen test of over-identifying restrictions indicates a non-significant p-value (p-value > 0.1) for status and statistics appeals, thus failing to reject the null hypothesis of instrument exogeneity. The F-test for weak instrumental variables indicates a significant p-value

( $F = 48.72$ ;  $p\text{-value} < 0.01$ ), rejecting the null hypothesis of weak instrumental variables for the instruments. Finally, the Durbin-Wu-Hausman test indicates a significant  $p\text{-value}$  ( $\chi^2 = 13.17$ ;  $p\text{-value} < 0.01$ ) for the instruments, thus rejecting the null hypothesis and suggesting the presence of endogeneity that needs to be corrected for with the instrumental variables. Hence, these instruments are found to be relevant and valid.

For the IFpG Factor, the Sargan-Hansen test of over-identifying restrictions indicates a non-significant  $p\text{-value}$  ( $p\text{-value} > 0.1$ ) for the instruments, thus failing to reject the null hypothesis of instrument exogeneity. The F-test for weak instrumental variables indicates a significant  $p\text{-value}$  ( $F = 11.78$ ;  $p\text{-value} < 0.01$ ), rejecting the null hypothesis of weak instrumental variables for the instruments. Finally, the Durbin-Wu-Hausman test indicates a significant  $p\text{-value}$  ( $\chi^2 = 41.462$ ;  $p\text{-value} < 0.01$ ) for the instruments, thus rejecting the null hypothesis for the instruments and suggesting the presence of endogeneity that needs to be corrected for with the instrumental variables. Hence, these instruments are found to be relevant and valid.

#### *5. 5. 1. 2. Action.*

In the “action” stage, endogeneity may exist because the number of incoming queries the STU marketing team responds to can be simultaneously decided with the number of unique applications created. To correct for this endogeneity, we use the cumulative number of applications created as an instrumental variable. The rationale to explain the relevance of this instrument is as explained in Section 4. 4. 1. 2 of *Study 1* and is supported by insights from the program directors and the marketing team at STU in *Study 2*. Furthermore, application submission is a decision made by prospective students and the cumulative number of applications created may not completely convert to application submissions. For instance, a

prospective student may create an application for a specific program at STU and submit a query to the STU team about the program and its requirements with regard to qualifications, acceptance rates, or preferred profiles. However, if the response gives the prospective student reason to believe that he/she does not stand a strong chance to be accepted into the program, the prospective student might decide to not submit the application. So, the cumulative number of applications created need not be related to the number of applications submitted.

We test for the validity of the instrument empirically. We find that the correlation between the number of unique applications submitted per week and the cumulative number of applications created is low. The instrument (cumulative number of applications created) is significantly correlated with the total number of incoming queries. The F-test for weak instrumental variables indicates a significant p-value ( $F = 9.6$ ,  $p\text{-value} < 0.01$ ), rejecting the null hypothesis of weak instrumental variables. The Durbin-Wu-Hausman test indicates a significant p-value ( $\chi^2 = 31.91$ ,  $p\text{-value} < 0.01$ ), thus rejecting the null hypothesis, and suggesting the presence of endogeneity that needs to be corrected for with the instrumental variable.

### 5. 5. 2. Model

The three-equation model for *Study 2* is the same as the model used in *Study 1*, with some differences that are noted below. In equation 4 that corresponds to the “consideration and intent” stage, we consider the parent/university brand DEF and the focal/school brand STU. So, equation 4 for *Study 2* is specified as below.

$$(4) \log(\text{appcrunique})_{jt} = \beta_{12j} + \beta_{13} \log(\widehat{\text{landnusers}})_{jt} + \beta_{14} \text{landretusers}_{jt} + \beta_{15} \text{brandSTU}_{jt} + \beta_{16} \text{brandDEF}_{jt} + \beta_{17} \text{info}_{jt} + \beta_{18} \text{info}^2_{jt} + \beta_{19} \text{progpps}_{jt} + \beta_{20} \text{brandSTU}_{jt} * \text{brandDEF}_{jt} + \beta_{21} \log(\widehat{\text{landnusers}})_{jt} * \text{progpps}_{jt} + \epsilon_{2jt}$$

where

*appcrunique* = number of unique applications created per week

$\log(\widehat{\text{landnusers}})$  = predicted number of new users on the landing page (from Equation 3)

*landretusers* = number of returning users on the landing page

*brandSTU* = number of messaging copies with brand STU

*brandDEF* = number of messaging copies with brand DEF  
*info* = number of messaging copies with an explicit call to learn more  
*progpps* = average number of program pages per session, and  
 $\epsilon_{2jt}$  = random error for equation 4.  $\epsilon_{2jt}$  is modeled as a function of past errors to capture any persistence effects.  
*j* = program  
*t* = week

In equation 6 corresponding to the “action” stage, we consider additional variables for emails, contacts, and the associated moderation terms. So, equation 6 for *Study 2* is specified as below.

$$\begin{aligned}
 (6) \log(\text{appsubunique})_{jt} = & \beta_{22j} + \beta_{23} \log(\widehat{\text{appcrunique}})_{jt} + \beta_{24} \text{totalleads}_{jt} + \beta_{25} \text{cta}_{jt} + \\
 & \beta_{26} \text{cta}^2_{jt} + \beta_{27} \text{progsessdur}_{jt} + \beta_{28} \text{progtop}_{jt} + \beta_{29} \text{progsessdur}_{jt} * \text{progtop}_{jt} + \\
 & \beta_{30} \text{totalemailsclicked}_{jt} + \beta_{31} \text{totalcontacts}_{jt} + \beta_{32} \log(\widehat{\text{appcrunique}})_{jt} * \text{totalemailsclicked}_{jt} + \\
 & \beta_{33} \log(\widehat{\text{appcrunique}})_{jt} * \text{totalcontacts}_{jt} + \beta_{34} \text{weekdummy}_{jt} + \beta_{35} \widehat{\eta}_{3jt} + \epsilon_{3jt}
 \end{aligned}$$

where

*appsubunique* = number of unique applications submitted per week  
*log (appcrunique)* = predicted number of unique applications created per week (from Equation 4)  
*totalleads* = number of incoming queries responded by XYZ marketing team  
*cta* = number of messaging copies with an explicit call to apply  
*progtop* = average time on program pages  
*progsessdur* = average session duration on program website  
*totalemailsclicked* = number of emails clicked on by prospective students  
*totalcontacts* = number of contacts between prospective students and STU’s marketing team  
*weekdummy* = dummy variable to indicate the week preceding/week of application deadline  
 $\widehat{\eta}_{3jt}$  = Incoming queries endogeneity correction term (residuals from the first stage regression in Equation 5), and  
 $\epsilon_{3jt}$  = random error for equation 6.  $\epsilon_{3jt}$  is modeled as a function of past errors to capture any persistence effects.  
*j* = program  
*t* = week

We run the model corresponding to each stage with a random effects specification and conduct the Hausman test to determine whether a program-level random or fixed effects specification is appropriate for each of the three modeling stages. In each of the equations corresponding to the three stages, we fail to reject the null hypothesis, indicating that the random effects specification is appropriate. The Hausman test was not significant for the “awareness and

interest” stage ( $\chi^2 = 0.93063$ , p-value = 0.3347), the “consideration and intent” stage ( $\chi^2 = 3.4882$ , p-value = 0.1748), and the “action” stage ( $\chi^2 = 1.66381$ , p-value = 0.645). As in *Study 1*, we use a log transformation [ $\log(1 + Y)$ ] of all three dependent variables since they are truncated at 0.

We conduct a first-stage regression in the “awareness and interest” and “action” stages to account for endogeneity, using the instrumental variables that we identified at these stages. The three main equations (3, 4, and 6) for *Study 2* can be estimated individually given the sequential process and the use of predicted values of the previous stage dependent variables. As discussed in *Study 1*, the inherent sequential student journey discussed earlier can make the errors to be correlated. We estimate these three equations corresponding to the three stages – Equations 3, 4, and 6 as a system of equations using a SUR estimation approach (Zellner 1962). We also estimate these three equations individually and find similar results as the SUR estimation. The error terms are bootstrapped to account for the control function approach in our analyses.

## **5. 6. Results**

### ***5. 6. 1. First-stage Estimation Results***

The results of the first-stage models in Equations 1 and 2 provide a better understanding of the impact of messaging appeals on the LT Factor, and the IFpG Factor. As hypothesized, the LT Factor increases with (a) an increase in the number of messaging appeals with status appeal ( $\alpha_1 = 13976$ ,  $p < 0.01$ ), and (b) an increase in the number of messaging appeals with statistics appeal ( $\alpha_2 = 7800$ ,  $p < 0.01$ ). This indicates that both these messaging appeals are important in determining the LT Factor. The IFpG Factor (a) decreases with an increase in the number of messaging appeals with personal appeal ( $\alpha_4 = -11828$ ,  $p < 0.1$ ), and (b) increases with an increase in the number of messaging appeals with potential appeal ( $\alpha_4 = 96221$ ,  $p < 0.01$ ). This

indicates that these messaging appeals are important in determining the IFpG Factor. The decrease in IFpG Factor with an increase in the messaging copies with personal appeal could be on account of lower budget allocation or advertising spend on messaging copies with personal appeal as compared to that for messaging copies with potential appeal.

In Equation 5, the number of total incoming queries increases with an increase in the cumulative number of applications created ( $\alpha_5 = 0.00756, p < 0.01$ ). This indicates that the cumulative number of applications created has an impact on the number of incoming queries responded to by STU.

### **5. 6. 2. Main Model Estimation Results**

Appendix D includes the descriptive statistics and correlation matrix for the data from *Study 2*.

We present the results of our estimated models for each of the three stages in Table 6.

----Insert Table 6 about here----

#### *5. 6. 2. 1. Awareness and Interest.*

The impressions on each of the messaging media in Equation 3 are scaled by expressing each variable in 10,000s. We find a significant positive relationship between the LT Factor and the number of new users on the landing page ( $\beta_1 = 0.5023, p < 0.01$ ). There is a significant negative relationship between (LT Factor)<sup>2</sup> and the number of new users on the landing page ( $\beta_4 = -0.01974, p < 0.01$ ). This implies an inverted U-shaped relationship between LT Factor and the number of new users on the landing page as a result of overexposure beyond a certain threshold, providing support for Hypothesis 1a.

There is a significant negative relationship between the IFpG Factor and the number of new users on the landing page ( $\beta_2 = -0.02088, p < 0.01$ ). There is a significant positive relationship between (IFpG Factor)<sup>2</sup> and the number of new users on the landing page ( $\beta_5 =$

$0.00009555, p < 0.01$ ). This implies that an increase in the IFpG Factor leads to a decrease in the number of new users on the landing page, but beyond a threshold, an increase in the IFpG Factor leads to an increasing number of new users on the landing pages. Thus, Hypothesis 1b is not supported. This indicates that in the case of a private university, exposures to messaging copies on Facebook, Instagram, and passive Google channels need to reach a critical mass before prospective students are persuaded to visit the landing page of the graduate program.

There is a significant negative relationship between Google search impressions and the number of new users on the landing page ( $\beta_3 = -0.8055, p < 0.01$ ). There is a significant positive relationship between (Google search impressions)<sup>2</sup> and the number of new users on the landing page ( $\beta_6 = 0.1683, p < 0.01$ ). This implies that an increase in the number of impressions on Google search leads to a decrease in the number of new users on the landing page but beyond a threshold, an increase in Google search impressions leads to an increasing number of new users on the landing pages. Thus, Hypothesis 1c is not supported. Prospective students perceive DEF to be an elite private university and may need more exposure to messaging copies on Google search before they are persuaded to visit the landing page of STU's graduate program and seek more information.

We find significant positive relationships for two of the three hypothesized cross-media synergistic effects. Results indicate cross-media synergies between the LT Factor and the IFpG Factor on the number of new users on the landing page ( $\beta_7 = 0.00091021, p < 0.01$ ). This implies that the interaction between the LT Factor and the IFpG Factor has a positive impact on the number of new users on the landing page. Figure 4. 1 illustrates the total effect size of the interaction between the LT Factor and the IFpG Factor. Thus, we find support for Hypothesis 2. We find significant negative cross-media synergies between the Google search impressions and

IFpG Factor ( $\beta_8 = -0.001787, p < 0.05$ ). Figure 4. 2 illustrates the total effect size of the interaction between Google search impressions and the IFpG Factor. This implies that the interaction between the Google Search impressions and the IFpG Factor has a negative impact on the number of new users on the landing page. This could be because a required critical mass of impressions is not reached on these media and the number of impressions on these media are not adequate to lead new users to the landing page. Thus, Hypothesis 3 is not supported. There is no significant interaction between the Google search impressions and the LT Factor. Cross-media synergies between Google search impressions and the LT Factor may not be achieved since a required critical mass of Google Search impressions is not reached. Thus, Hypothesis 4 is not supported.

----Insert Figures 4. 1 and 4. 2 about here----

#### 5. 6. 2. 2. *Consideration and Intent.*

In Equation 4, we find a significant positive relationship between the predicted number of new users on the landing page and the number of unique applications created per week ( $\beta_{13} = 1.024, p < 0.01$ ). Thus, Hypothesis 5 is supported. We also find a significant positive impact of returning users on the number of unique applications created per week ( $\beta_{14} = 0.0003927, p < 0.01$ ), thus supporting Hypothesis 6.

We find a significant negative relationship between the number of messaging copies with brand STU and the number of unique applications created per week ( $\beta_{15} = -0.1391, p < 0.01$ ). Thus, Hypothesis 7 is not supported. However, we find that there is a significant positive relationship between (Brand STU)<sup>2</sup> and the number of new users on the landing page ( $\beta = 0.06855, p < 0.01$ ). This indicates that in the case of the business school of a private university, the number of messaging copies highlighting the focal/school brand need to reach a critical mass

before they have a positive impact on application creation by prospective students. The number of messaging copies emphasizing the STU brand may have been lesser than the number required to have a positive impact on the number of applications created. Prospective students may not be familiar with the STU brand and may need more brand-focused messaging about different aspects of STU to be persuaded to create applications for its graduate programs.

On the other hand, a significant positive relationship is observed between the number of messaging copies with brand DEF and the number of unique applications created per week ( $\beta_{16} = 0.0254, p < 0.01$ ), thereby supporting Hypothesis 8. However, we observe a significant positive relationship between (Brand DEF)<sup>2</sup> and the number of new users on the landing page ( $\beta = -0.0001486, p < 0.01$ ) which indicates an overexposure effect.

Importantly, the interaction of the number of messaging copies with brand STU and the number of messaging copies with brand DEF has a significant negative impact on the number of unique applications created per week ( $\beta_{20} = -0.0010457, p < 0.01$ ). Figure 4. 3 illustrates the total effect size of the interaction between the number of messaging copies with brand STU and the number of messaging copies with brand DEF. This indicates that the negative impact of the messaging copies with the STU brand on encouraging the creation of applications is strengthened by having messaging copies with the DEF brand. Hence, we do not find support for Hypothesis 9. One reason for this detrimental synergy effect might be the lower familiarity of the STU brand which requires more and varied messaging copies that complement the messaging copies with DEF brand to have a positive synergistic effect on encouraging application creation.

----Insert Figure 4. 3 about here----

We do not find a significant relationship between the number of messaging copies with a call to learn more and the number of unique applications created. However, there is a significant

negative effect observed for the (number of messaging copies with a call to learn more)<sup>2</sup> ( $\beta_{17} = -0.0005981, p < 0.01$ ). Hence, we find only partial support for Hypothesis 10. This could possibly mean that for graduate programs at private universities, digital messaging copies with a call to learn more are not helpful in encouraging application creation. Prospective students may not be influenced by these messaging copies to create applications, and beyond a threshold these messaging copies could be counterproductive to encouraging the creation of applications.

Finally, the average number of program pages per session has a negative moderating effect on the relationship between the number of new users on the landing page and the number of unique applications created per week ( $\beta_{21} = -0.008451, p < 0.01$ ). Figure 4. 4 illustrates the total effect size of the moderation effect of the average number of program pages per session. As the average number of program pages per session increases, the positive impact of the number of new users on the landing page on the number of applications created becomes less positive. Thus, we do not find support for Hypothesis 11. As a business school at a private university, STU's program websites may contain information about the programs and admission criteria that may be intimidating to many prospective students. As new users on the landing pages browse more pages on the program websites, they acquire more information about the graduate programs they are interested in. In doing so, they may determine that they do not meet the admission criteria and consequently, they may decide to not create applications.

----Insert Figure 4. 4 about here----

### 5. 6. 2. 3. Action.

In Equation 6, the predicted number of unique applications created per week shows a significant positive relationship with the number of unique applications submitted per week ( $\beta_{23} = 0.55101, p < 0.05$ ), thereby supporting Hypothesis 12. We find a significant negative relationship between

the number of incoming queries responded by the STU marketing team and the number of unique applications submitted per week ( $\beta_{24} = -0.0020846, p < 0.01$ ). Hypothesis 13 is not supported. The nature of incoming queries at STU is typical of schools within private universities that have a perception of exclusivity and high standards. In the case of private universities, prospective students' queries to the school tend to be focused on confirming their notions of not meeting the school's requirements. That is, prospective students may try to gain more information from the school regarding their chances of being accepted into their program of choice. When these students receive responses from the school that confirm their notions, they may decide to not submit their applications. As a result, as the number of these queries increases, the number of applications submitted actually declines.

We observe a significant positive relationship between the number of messaging copies with a call to action and the number of unique applications submitted per week ( $\beta_{25} = 0.005891, p < 0.01$ ). We also find a significant negative relationship between the (number of messaging copies with a call to action)<sup>2</sup> ( $\beta_{26} = -0.00002705, p < 0.01$ ). Thus, we find support for Hypothesis 14.

There is no significant relationship between the average session duration on the program website and the number of unique applications submitted per week. Thus, we do not find support for Hypothesis 15. In this regard, the average time spent on program pages does not have a significant moderating effect on the relationship between the average session duration on the program website and the number of unique applications submitted per week. Hence, we do not find support for Hypothesis 16. The average session duration of prospective students and their average time spent on the program website may not influence their application submission decisions. Prospective students may prefer communicating directly with the STU team for

information on their application and program-related queries and requests. This could be on account of the specialized nature of STU's graduate programs and prospective students' need to confirm their chances of being accepted into STU's programs.

We find that the number of emails clicked on by prospective students has a positive moderating effect on the relationship between the number of unique applications created per week and the number of unique applications submitted per week ( $\beta_{32} = 0.009505, p < 0.01$ ). Figure 4. 5 illustrates the total effect size of the moderation effect of the number of emails clicked on by prospective students. As the number of emails clicked on by prospective students increases, the positive relationship between the number of unique applications created per week and the number of unique applications submitted per week is strengthened. This implies that as prospective students who have created applications click on an increasing number of personally relevant and informative emails from STU, they are further motivated to submit their applications, leading to a higher number of application submissions. Thus, Hypothesis 17 is supported.

----Insert Figure 4. 5 about here----

However, the number of contacts with prospective students has a negative moderating effect on the relationship between the number of unique applications created per week and the number of unique applications submitted per week ( $\beta_{33} = -0.001816, p < 0.01$ ). Figure 4. 6 illustrates the total effect size of the moderation effect of the number of contacts with prospective students. As the number of contacts between STU and prospective students who have created applications increases, the positive impact of number of applications created on the number of applications submitted becomes less positive. Thus, we do not find support for Hypothesis 18. The reason for this could be the nature of typical contacts at this stage, which include (i)

prospective students submitting their test scores, making phone calls requesting specific assistance or information, requesting application-related help and program-related information, requesting financial waivers, as well as (ii) STU's team sharing program information, program viewbooks, providing specific information to students via phone calls or voicemails, reviewing resumes, updating student requests for fee waivers, visa requirements, etc. The information received from STU's team on these requests or queries may lead prospective students to determine that they are unlikely to be accepted into their programs of interest because they do not meet certain admission criteria (e.g., requirements related to test scores or prerequisites). Alternatively, based on the additional information gathered through these contacts, prospective students may determine that their desired goals may not be entirely aligned with those of their program of interest. In some cases, these contacts might lead prospective students to feel that they may not be able to keep up with the demands of the program. Hence, although these prospective students have created applications, their contacts with STU's team may lead them to decide against submitting the application. Finally, the week dummy shows a significant positive relationship with the number of unique applications submitted per week ( $\beta_{34} = 1.31699$ ,  $p < 0.01$ ), confirming that there is a peak effect which has been captured.

----Insert Figure 4. 6 about here----

## **5. 7. Implementation Results**

The implementation of the proposed conversion funnel framework in STU resulted in an improvement for 2019 (over 2018) across all the three stages of the conversion funnel – prospective students visiting the websites for information, creating online applications, and submitting the created applications. First, the results indicate that the visits to the program websites' pages increased by 24.11%, while the website engagement rate decreased by 10.18%

(measured as an increase in website bounce rate). This indicates the success of the conversion funnel framework in targeting the right audience with the relevant message. Second, the number of applications created increased by 42.15%. Based on *Study 2*, we identify that the mention of brand DEF is an important factor that influences prospective students to create applications. Third, the number of applications submitted increased by 10.11%. Through appropriate targeting and implementation of the conversion funnel framework, XYZ ensured that the prospective students who enter the top of the funnel as new users on the landing page continue on to create applications, engage with XYZ to complete their applications, and finally submit their applications. Overall, whereas XYZ wanted to enroll 472 students in 2019 (an increase over 2018), the proposed strategy implementation resulted in the enrollment of 519 students (an increase of 10.19% from 471 students in 2018). The over-achievement of the target enrollment was possible through the efficiency and effectiveness of the proposed framework. The implementation of the conversion funnel framework in *Study 2*, with additional marketing interventions in the action stage clearly demonstrates the generalizability of the framework.

The results of the model estimation in *Study 2* also highlight some key differences between public and private universities with regard to relative influences of marketing interventions on desired outcomes. Although the results of the model estimation do not support some of the hypothesized relationships with regard to marketing interventions and interaction and moderation effects, these can be explained by the premier and exclusive STU/DEF brand and STU's objective of receiving applications from prospective students who meet its high bar of excellence. The framework succeeds in (i) drawing the attention of prospective students who fit the target personas of the respective graduate programs, (ii) encouraging application creation from prospective students who align with the high standards, expectations of quality, and

rigorous nature of STU's graduate programs, and (iii) driving application submission by prospective students who demonstrate the qualifications and potential to excel in the graduate programs at STU, thus improving the class profile.

## 6. Discussion

From a conceptualization standpoint, specific to the higher education context, this research was successful in answering the three research questions that were presented in Section 1. First, the research provides directions for a digital strategy on the messaging copies and mediums that are most effective at bringing prospective students to the program landing pages and driving them to create and submit applications. The messaging hierarchies that included the target personas and the value propositions helped marketing teams at XYZ and STU to create and deliver the marketing interventions as proposed in the conversion funnel framework. Study 1 and Study 2 also highlighted key differences in the application of the conversion funnel framework at public vs. private universities.

Second, *Study 1* and *Study 2* helped evaluate the influence of the different messaging media in creating awareness among prospective students for each program and driving them to the respective program landing pages. Specifically, these two studies identified the importance of messaging focused on the parent/university (brand ABC and brand DEF) and having new landing page users visiting more program pages per session in encouraging prospective students to create applications for the graduate programs at XYZ and STU. Email communications and contacts between the schools' teams and prospective students and the school's responsiveness to incoming queries also play an important role in driving application submissions. Thus, *Study 1* and *Study 2* highlight that by creating awareness among their target prospective students at the beginning of the student journey, XYZ and STU were able to ensure that a higher number of

applications were submitted by prospective students who align with the target personas for the programs, eventually resulting in higher enrollment. Additionally, the digital-first approach adopted in this research was effective in enabling XYZ and STU to sense and respond to the needs and behaviors of the prospective students. The sense-and-respond ability equipped these schools to deploy their adaptive marketing capabilities, by adopting an outside-in perspective of the market. This, we believe, lies at the core of this proposed framework.

Thus, the proposed conversion funnel framework presents a strategic approach that is grounded in a deep understanding of the organization's value proposition and target audience, as well as the sequential nature of the organization's conversion funnel. Nonprofit organizations can maximize their performance and achieve their goals by applying and implementing the conversion funnel framework in their context to achieve their specific goals. We also provide direction on the measurement and maximization of the organizational performance at each stage of the conversion funnel. By detailing the steps followed *Study 1* and *Study 2* in implementing the conversion funnel framework, we provide an understanding of the managerial decisions that nonprofit organizations need to make in implementing the framework. In doing so, this research comprising *Study 1* and *Study 2* contributes to the theory and practice related to digital marketing for nonprofit organizations in the following ways.

### **6. 1. Academic Contributions**

Our research contributes to the existing literature on nonprofits and digital marketing in four aspects. First, this research blends qualitative and quantitative research techniques to conceptualize a rigorous and relevant conversion funnel framework wherein nonprofit organizations can leverage digital marketing to measure and maximize their performance (even in real-time). By conducting action research nonprofit organizations can identify the target

audience for each of their offerings, their needs and motivations, as well as the value propositions of the offerings. Action research has been hitherto underutilized in marketing and our research highlights the value of the insights from action research in developing and implementing marketing strategy. Importantly, the application of qualitative and quantitative research techniques enables the development of a conversion funnel framework that can be customized to address the goals and offerings of any nonprofit organization.

Second, the insights from the action research helped develop the messaging content, the channels to be used, and the target audience. The proposed conversion funnel framework considers multiple channels such as social media channels (i.e., LinkedIn, Twitter, Facebook, Instagram), Google Search, Google Display, Google Retargeting, and the organization's websites, as well as email communications and offline contacts. In doing so, the framework also considers multiple customer touchpoints across the decision-making process, enabling the development of a digital marketing approach that is targeted, relevant, and impactful at each stage. The consideration of a wide range of digital channels and multiple customer touchpoints makes this research more comprehensive than earlier studies.

Third, by systematically identifying the relevant target audiences and delivering targeted information through relevant channels, the proposed conversion funnel framework implemented in this research comprehensively traversed the cognitive, affective, and conative stages of consumer decision making. The results from such an approach observed in the digital context, for the first time, make this study unique while serving as further evidence of the hierarchy of effects approaches proposed by prior studies. Thus, this research provides an empirical testing of the hierarchy of effects model in a digital setting as seen in the case of nonprofit organizations.

By doing so, we contribute to the body of academic literature on the hierarchy of effects and consumer decision-making.

Finally, we demonstrate the generalizability and robustness of the proposed conversion funnel framework through its application at two different nonprofit organizations and show that the performance improvement observed in *Study 1* and *Study 2* can be replicated at other nonprofit organizations.

## **6. 2. Managerial Contributions**

On a managerial level, this research contributes in the following ways. First, this research provides a digital marketing approach that allows for digital marketing activities to be designed and executed in alignment with organizational goals. Managerially, we expect that the proposed conversion funnel framework can guide nonprofit organizations in developing digital marketing strategies to convert their prospects into students, customers, donors, or volunteers as the case may be. The proposed framework based on insights from action research can guide a nonprofit organization on developing and executing the specific messaging content, messaging media, target audiences, website improvements, emails, and other individual-level contacts to lead prospects through the three stages of the organization's conversion funnel to the final goal of driving action. In doing so, this research provides direction to measure and maximize the performance of nonprofit organizations at every stage of the implementation of this digital marketing approach across multiple customer touchpoints.

Second, this study demonstrates a resource reallocation strategy that is data-driven, aligned to the needs of the target audience, and flexible to real-time adjustments. Thus, this study highlights the efficiency and effectiveness of the firm's digital messaging decisions and offers further support for the reallocation of resources towards digital marketing. The actual

implementation of the conversion funnel framework is tracked in real-time, enabling decision-making that is driven by data and in response to in-field performance. Nonprofit organizations can empirically examine the specific marketing and communications plans and make decisions that can lead to the desired enrollment outcomes. The agility of this framework in responding to the in-field performance of messaging copies is the first of its kind, especially in the context of higher education and nonprofit organizations. In this regard, this research demonstrates that organizations can achieve their stated goals within budgetary constraints by using the proposed framework and reallocating resources across different digital media in response to the in-field performance. The successful real-time implementation of the conversion funnel framework at two different universities also indicates its ability to achieve organizational outcomes at other nonprofit organizations.

## **7. Limitations and Future Research**

Overall, this research presents important implications for nonprofit organizations who seek to achieve specific organizational goals. We provide substantial evidence that digital marketing strategies are effective and efficient in helping nonprofit organizations connect with their target audiences and to encourage them toward taking action. However, this research has some limitations that could present fruitful avenues for future research.

First, in *Study 2*, our analysis does not investigate the influence of email communications and contacts on the creation of applications, i.e., their role in establishing consideration and intent. For prospective students who have not created applications but have submitted inquiries to the school's team or appear in prospect lists that are shared with the school's team, personalized emails and contacts from the school's team could encourage application creation. In

a follow-up study, we propose to examine the influence of email communications and contacts between prospective students and the school's team on encouraging application creation.

Second, we propose to corroborate the findings from our econometric modeling in *Study 1* and *Study 2* by using machine learning. We also intend to apply text analytics to examine textual data on the subject of emails and contacts between the school's team and prospective students in greater detail.

Third, while we have only considered graduate programs in our study, future research could study other programs – e.g., specialized certificate programs, and undergraduate programs – and reveal key differences between these programs. As these programs differ with regard to the time taken to convert prospective students, an investigation into these differences could further strengthen the conversion funnel framework. In a broader sense, future research could investigate the application of the conversion funnel framework in other nonprofit organizations operating in other domains and investigate the time element in prospect conversion.

Next, this research does not consider competition-related factors or interventions; however, an investigation into the marketing strategies and campaigns of competing nonprofit organizations within the consideration set of prospects would help researchers identify market-level differences. Broader themes in the economy that could potentially have an impact on customer conversion for nonprofit organizations have also not been considered.

Furthermore, the impact of the conversion funnel framework on achieving goals such as financial aid, diversity, international student enrollment, alumni involvement, etc. in the higher educational context. In a broader nonprofit context, future research could investigate the conversion funnel framework in the context of increasing donor volume and contributions,

attracting volunteers, and so on. These could provide interesting insights on the differences in the implementation of the conversion funnel framework across varied organizational goals.

Finally, this research does not examine the behavior of prospects beyond the purchase decision. The post-purchase behavior of customers with regard to conversations on social media and other online communications with the nonprofit organization could provide insights on the impact of a digital marketing strategy on word-of-mouth and feedback. Subsequently, these insights could inform the next implementation instance of the conversion funnel framework. In other words, customer engagement can be measured as a consequence of the proposed framework.

## Tables and Figures

**Table 1: Comparison of Select Digital Marketing Studies**

Studies	Study focus	Type of data	Digital media considered			Multiple customer touchpoints considered	Industry	Accounting for endogeneity	Key findings
			Social media	Google Search, Display, and Retargeting	Firm's website				
<b>Select Studies Across Industries</b>									
Bleier et al. (2019)	Investigate the impact of specific design elements of web pages on customer experience and customer purchase.	Experiment	Yes	No	Yes	No	E-commerce	NA	Cognitive, affective, social, and sensory nature of online customer experience influences purchase. Search products benefit from a more informative experience, but experience products benefit from a social experience.
Bruce et al. (2017)	Study the joint effects of creative ad formats, message content, targeting, and retargeting on the performance of digital ads over time.	Panel	No	Yes	No	No	Retail	Yes	Animated ads have higher carryover effects, affecting engagement for a longer duration than static ads. Retargeted ads were effective only when they offered price incentives.
Danaher et al. (2006)	Examine factors that affect web site visit duration.	Panel	No	No	Yes	No	Multiple	NA	Higher levels of text and ad content result in shorter visit times, except

Studies	Study focus	Type of data	Digital media considered			Multiple customer touchpoints considered	Industry	Accounting for endogeneity	Key findings
			Social media	Google Search, Display, and Retargeting	Firm's website				
									for older web users.
De Vries et al. (2017)	Examine the relative effectiveness of traditional advertising, firm-to-consumer messages and consumer-to-consumer messages for brand-building and customer acquisition efforts.	Panel	Only Facebook and Twitter	No	No	No	Telecom	Yes	While traditional advertising is most effective for both brand building and customer acquisition, firm-to-consumer social media messages complement traditional advertising.
Kumar et al. (2013)	Create and deploy a social media strategy for a retailer and measure its success.	Cross-sectional	Yes	No	No	No	Retail	NA	Social media can be used to generate growth in sales, ROI, and positive word of mouth and can spread brand knowledge.
<b>Select Studies in Higher Education</b>									
Clark et al. (2017)	Explore the impact of social media engagement on the relationship quality between the university and students.	Online Survey (Cross-sectional)	Yes	No	No	No	Higher education	NA	The relationship quality may be increased even more when the university connects with its students via multiple social media sites.
Peruta and Shields (2017)	Understand how schools can determine the specific type of content and the	Cross-sectional	Only Facebook	No	No	No	Higher education	NA	Schools that post more frequently see less overall engagement per post. Including photos in posts

Studies	Study focus	Type of data	Digital media considered			Multiple customer touchpoints considered	Industry	Accounting for endogeneity	Key findings
			Social media	Google Search, Display, and Retargeting	Firm's website				
	frequency of posts to drive engagement								increases the relative engagement of the post.
Shields and Peruta (2018)	Understand the role of social media in the student decision-making process	Survey and Interviews	Yes	No	No	No	Higher education	NA	Students use social media channels to learn more about higher education schools under consideration.
This Research	Develop a conversion funnel framework using specific communication content and messaging and delivering it to the target audience via the appropriate digital marketing channels.	Panel	Yes	Yes	Yes	Yes	Higher education	Yes	Deep target audience understanding, message value proposition clarity, compelling content, engaging web experience, instrumented marketing interventions, and real-time performance monitoring of digital marketing are critical in achieving key outcomes at each stage of the conversion funnel, and ultimately increasing the number of applications submitted.

**Table 2: Graduate Programs included in the Implementation of the Conversion Funnel**

**Framework**

Study 1 – XYZ Business School	Study 2 – STU Business School
<ul style="list-style-type: none"> <li>• Masters in Business Administration (MBA)</li> <li>• Masters in Professional Accountancy (MPA)</li> <li>• Masters in Analytics (MSA)</li> <li>• Masters in Finance (MSF)</li> <li>• Masters in Marketing (MKT)</li> <li>• Masters in Information Systems (MSIS)</li> <li>• Masters in International Business (MIB)</li> <li>• Masters in Actuarial Sciences (MAS) / Masters in Risk Management (MRM)<sup>4</sup></li> </ul>	<ul style="list-style-type: none"> <li>• 1-year Masters in Business Administration (MBA1)</li> <li>• 2-year Masters in Business Administration (MBA2)</li> <li>• M.S. in Accountancy (MSA)</li> <li>• M.S. in Business Analytics (MSBA)</li> <li>• M.S. in Business Analytics (MSBA – Chicago)</li> <li>• M.S. in Finance (MSF)</li> <li>• M.S. in Management (MSM)</li> <li>• Executive Masters in Business Administration (EMBA – Residential)</li> <li>• Executive Masters in Business Administration (EMBA – Chicago)</li> <li>• Masters in Nonprofit Administration (MNA)</li> <li>• Executive Masters in Nonprofit Administration (EMNA)</li> <li>• Dual Degree: Masters in Business Administration and M.S. in Business Analytics (MBA/MSBA)<sup>5</sup></li> </ul>

<sup>4</sup> The MAS/MRM program is offered jointly by XYZ and is reflected accordingly in the marketing communication messages. Therefore, we consider them as one program.

<sup>5</sup> The MBA/MSBA program is offered jointly by STU and is reflected accordingly in the marketing communication messages. Therefore, we consider them as one program.

**Table 3: Model Variables and Operationalization**

Variable Category	Variable Name	Operationalization
<b>Equation 1: Awareness and Interest</b>		
Dependent Variable	log(landusers)	Log (Number of New Users on the Landing Page of the program)
Independent Variables:	litwimp	Factor that includes the number of impressions on LinkedIn and Twitter
	igfbgpassimp	Factor that includes the number of impressions on Instagram, Facebook, and passive Google channels (Google Display and Google Retargeting)
	gsimp	Number of impressions on Google Search
<b>Equation 2: Consideration and Intent</b>		
Dependent Variable	log(appcrunique)	Log (Number of unique applications created per week)
Independent Variables:	log(landusers)	Log (Number of New Users on the Landing Page of the program)
	landretusers	Number of returning users on the landing page
	brandXYZ	Number of messaging copies with XYZ brand in the content
	brandABC	Number of messaging copies with ABC brand in the content
	brandSTU	Number of messaging copies with STU brand in the content (Study 2 only)
	brandDEF	Number of messaging copies with DEF brand in the content (Study 2 only)
	info	Number of messaging copies with an explicit call to learn more
	progpps	Average number of program website pages per session
<b>Equation 3: Action</b>		
Dependent Variable	log(appsubunique)	Log (Number of unique applications submitted per week)
Independent Variables:	log(appcrunique)	Log (Number of unique applications created per week)
	totalleads	Total number of incoming queries responded to by school/focal brand (XYZ in Study 1, STU in Study 2)
	cta	Number of messaging copies with an explicit call to action
	progtop	Average time spent on program pages
	progsessdur	Average session duration on program website
	totalemailslicked	Total number of emails clicked on by prospective students (Study 2 only)
	totalcontacts	Total number of contacts between prospective students and STU team (Study 2 only)
	weekdummy	Dummy variable to account for peak around application deadlines

**Table 4: Types of Messaging Appeals and Illustrative Messaging Copies**

<b>Messaging Appeal</b>	<b>Description</b>	<b>Messaging Copy Text</b>
Status Appeal	To communicate a sense of belonging to a certain coveted group	<ul style="list-style-type: none"> <li>• Become a finance leader. Become a financial leader with XYZ's M.S. in Finance degree. Learn more now.</li> </ul>
Potential Appeal	To communicate a sense of empowerment to turn dreams into reality	<ul style="list-style-type: none"> <li>• Double up your career potential. XYZ's innovative dual degree program provides the opportunity to earn your Masters of Actuarial Science, and a Masters in Quantitative Risk Analysis and Management.</li> </ul>
Personal Appeal	To communicate a sense of concern about achieving personal goals	<ul style="list-style-type: none"> <li>• Master of Science in Finance – XYZ Business School. Invest in your career with an immersive M.S. in Finance degree from XYZ Business School at ABC University. Learn More.</li> </ul>
Statistics Appeal	To communicate proof and statistics	<ul style="list-style-type: none"> <li>• Discover M.S. in Analytics - XYZ Business School. Partner with top *city PQR* firms at the No. *##* innovative University in the U.S. Learn about our M.S. in Analytics today!</li> </ul>

**Table 5: Model Estimation Results – Study 1**

	(I) Landing Page New Users	(II) Unique Applications Created	(III) Unique Applications Submitted
<b><i>"Awareness and Interest" Stage (estimates scaled by 10,000)</i></b>			
LT Factor	0.2091 (0.04323) ***	N/A	N/A
IFpG Factor	0.08013 (0.03028) ***	N/A	N/A
Google Search Impressions	2.167 (0.2818) ***	N/A	N/A
(LT Factor) <sup>2</sup>	-0.00701 (0.001499) ***	N/A	N/A
(IFpG Factor) <sup>2</sup>	-0.001503 (0.0006014) **	N/A	N/A
(Google Search Impressions) <sup>2</sup>	-0.3122 (0.04752) ***	N/A	N/A
LT Factor X IFpG Factor	0.003662 (0.0006645) ***	N/A	N/A
Google Search Impressions X LT Factor	0.03252 (0.005814) ***	N/A	N/A
Google Search Impressions X IFpG Factor	0.01193 (0.002622) ***	N/A	N/A
LT Factor endogeneity correction term	0.07144 (0.01784) ***	N/A	N/A
IFpG Factor endogeneity correction term	0.0544 (0.0162) ***	N/A	N/A
<b><i>"Consideration and Intent" Stage</i></b>			
Log (Landing Page New Users)		0.07315 (0.00745) ***	N/A
Landing Page Returning Users		0.005835 (0.002434) **	N/A
Messaging Copies with Brand XYZ		0.005714 (0.00064) ***	N/A
Messaging Copies with Brand ABC		0.30715 (0.04336) ***	N/A
Messaging Copies with Call to Learn More		0.0083 (0.003708) **	N/A
(Messaging Copies with Call to Learn More) <sup>2</sup>		n.s	N/A
Average Program Pages per Session		n.s	N/A
Messaging Copies with Brand XYZ X Messaging Copies with Brand ABC		0.0056097 (0.0009019) ***	N/A
Log (Landing Page New Users) X Average Program Pages per Session		0.004062 (0.00016144) ***	N/A
<b><i>"Action" Stage</i></b>			
Log (Number of Unique Applications Created per week)			0.74943 (0.03361) ***
Total Number of Incoming Queries			0.015154 (0.003026) ***
Messaging Copies with Call to Action			0.0125 (0.003857) ***

	(I)	(II)	(III)
	Landing Page New Users	Unique Applications Created	Unique Applications Submitted
(Messaging Copies with Call to Action) <sup>2</sup>			n.s
Average time on program pages			0.0011179 (0.0002989) ***
Average session duration on program website			n.s
Average session duration on program website X			0.0000053424 (0.0000015) ***
Average time on program pages			
Incoming Queries endogeneity correction term			0.006607 (0.00072) ***
Week Dummy			0.74439 (0.16762) ***

\*\*p <0.05, \*\*\*p <0.01

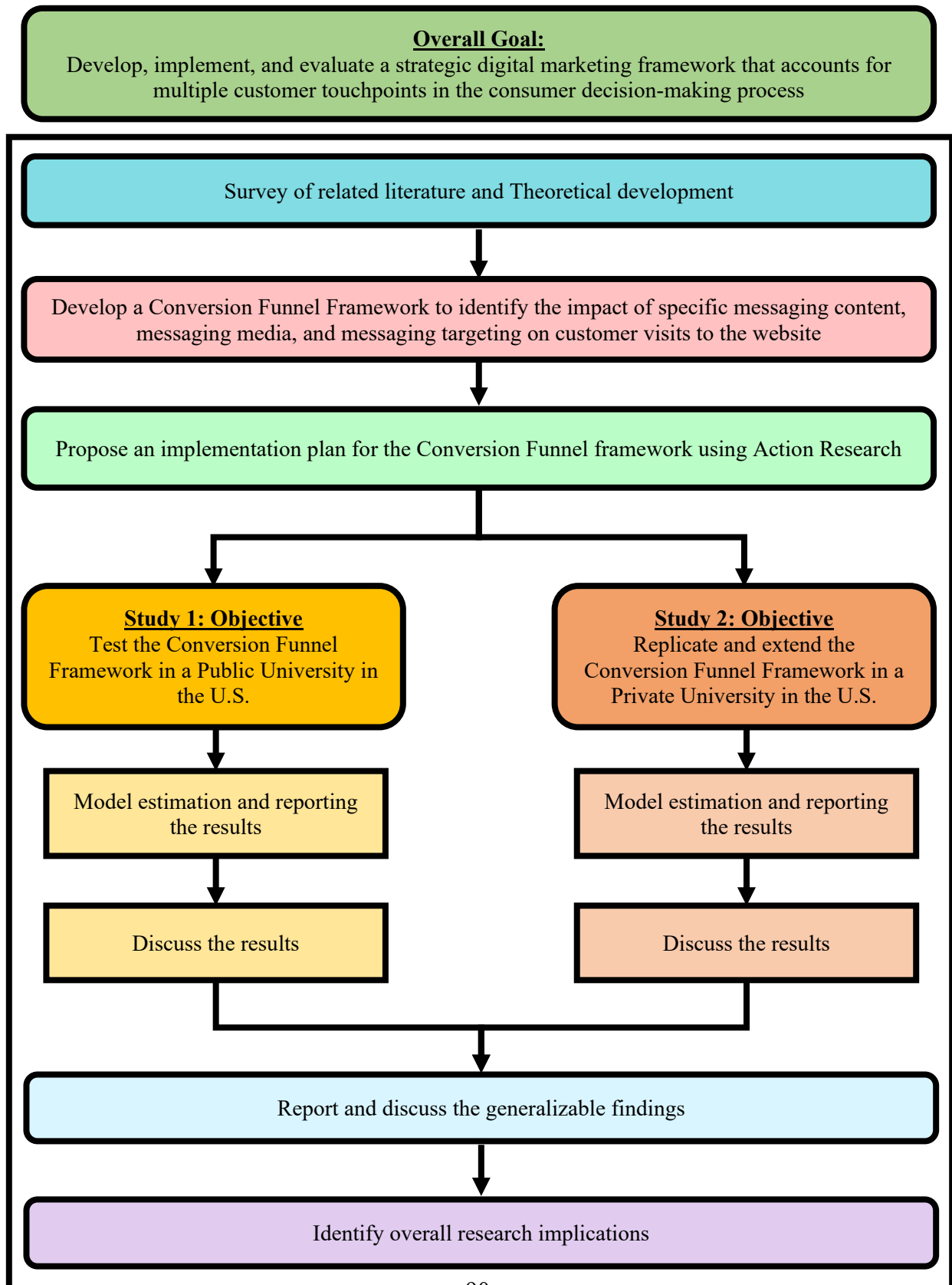
**Table 6: Model Estimation Results – Study 2**

	(I) Landing Page New Users	(II) Unique Applications Created	(III) Unique Applications Submitted
<i>"Awareness and Interest" Stage (estimates scaled by 10,000)</i>			
LT Factor	0.5023 (0.0155121) ***	N/A	N/A
IFpG Factor	-0.02088 (0.0018229) ***	N/A	N/A
Google Search Impressions	-0.8055 (0.1206772) ***	N/A	N/A
(LT Factor) <sup>2</sup>	-0.01974 (0.0006293) ***	N/A	N/A
(IFpG Factor) <sup>2</sup>	0.00009555 (0.0000068) ***	N/A	N/A
(Google Search Impressions) <sup>2</sup>	0.1683 (0.0347583) ***	N/A	N/A
LT Factor X IFpG Factor	0.00091021 (0.0000659) ***	N/A	N/A
Google Search Impressions X LT Factor	n.s	N/A	N/A
Google Search Impressions X IFpG Factor	-0.001787 (0.0008705) **	N/A	N/A
LT Factor endogeneity correction term	0.233 (0.0074399) ***	N/A	N/A
IFpG Factor endogeneity correction term	-0.008162 (0.0006843) ***	N/A	N/A
<i>"Consideration and Intent" Stage</i>			
Log (Landing Page New Users)		1.024 (0.05995) ***	N/A
Landing Page Returning Users		0.0003927 (0.0000544) ***	N/A
Messaging Copies with Brand STU		-0.1391 (0.0291731) ***	N/A
Messaging Copies with Brand DEF		0.0254 (0.0009605) ***	N/A
Messaging Copies with Call to Learn More		n.s	N/A
(Messaging Copies with Call to Learn More) <sup>2</sup>		-0.0005981 (0.000137) ***	N/A
Average Program Pages per Session		-0.014589 (0.0008228) ***	N/A
Messaging Copies with Brand STU X Messaging Copies with Brand DEF		-0.00104573 (0.0002526) ***	N/A
Log (Landing Page New Users) X Average Program Pages per Session		-0.00845104 (0.0021082) ***	N/A

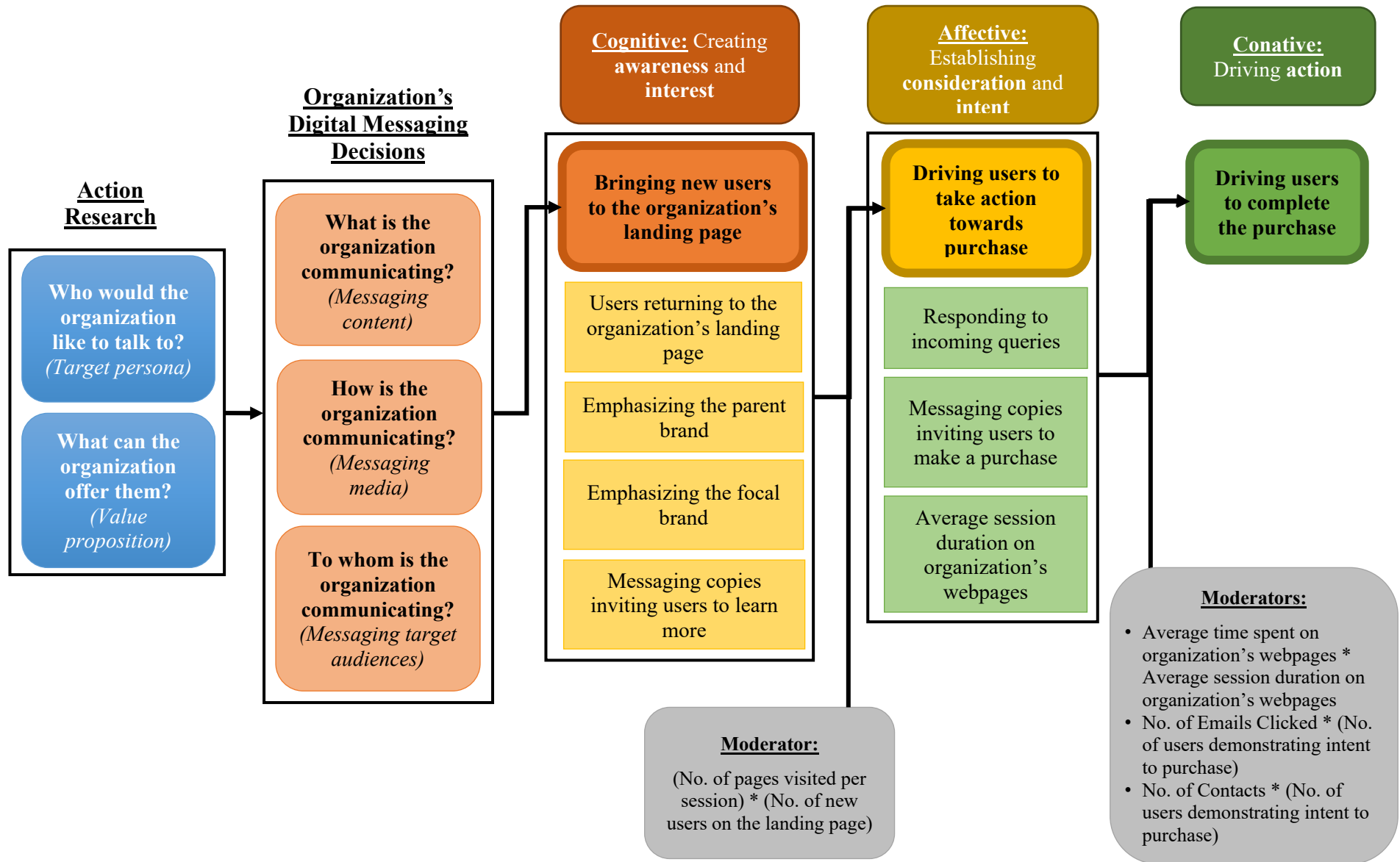
	(I) Landing Page New Users	(II) Unique Applications Created	(III) Unique Applications Submitted
<i>"Action" Stage</i>			
Log (Number of Unique Applications Created per week)			0.5510084 (0.2293256) **
Total Number of Incoming Queries			-0.0020846 (0.0002644) ***
Messaging Copies with Call to Action			0.005891 (0.0013619) ***
(Messaging Copies with Call to Action) <sup>2</sup>			-0.00002705 (0.0000085) ***
Average time on program pages			0.000089759 (0.0000403) **
Average session duration on program website			n.s
Average session duration on program website X			n.s
Average time on program pages			n.s
Total Number of Emails Clicked			n.s
Total Number of Contacts			0.00005986 (0.0000115) ***
Log (Number of Unique Applications Created per week)			0.009505 (0.0035133) ***
X Total Number of Emails Clicked			-0.001816 (0.0003738) ***
Log (Number of Unique Applications Created per week)			0.0075602 (0.0002905) ***
X Total Number of Contacts			1.3169887 (0.0276514) ***
Incoming Queries endogeneity correction term			
Week Dummy			

\*\*p < 0.05, \*\*\*p < 0.01

**Figure 1: Developing and Implementing the Conversion Funnel Framework**

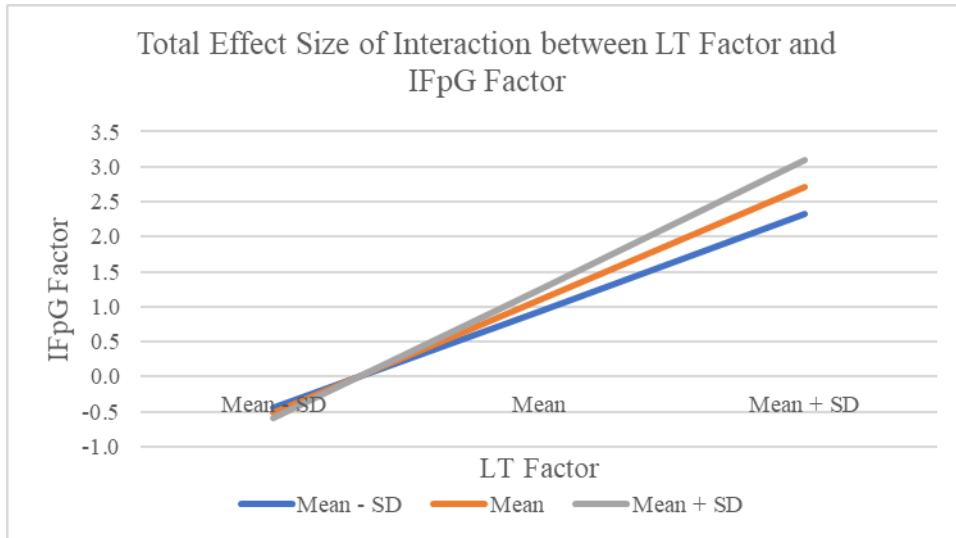


**Figure 2: Conversion Funnel Framework for Nonprofit Organizations**

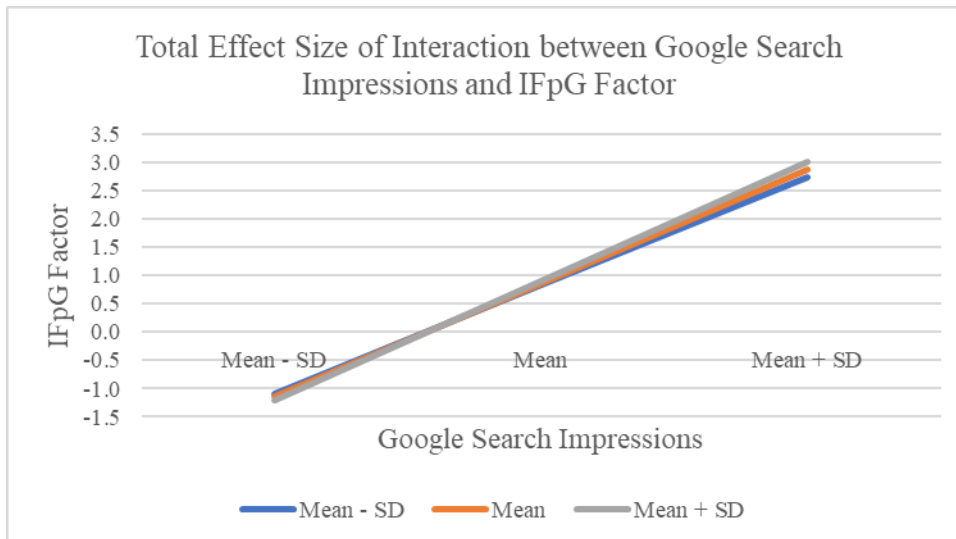


**Figure 3: Total Effect Sizes of Interaction and Moderation Effects – Study 1**

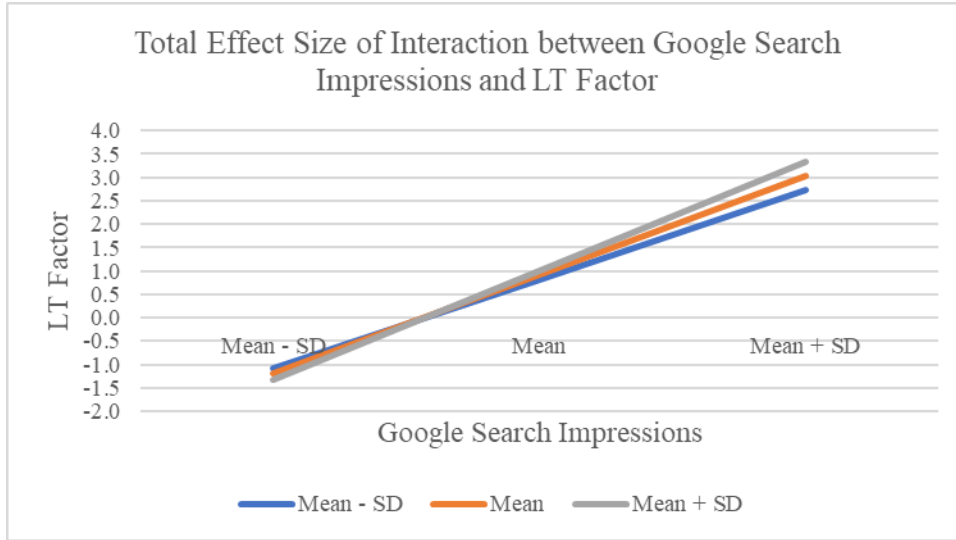
**Figure 3. 1: LT Factor X IFpG Factor**



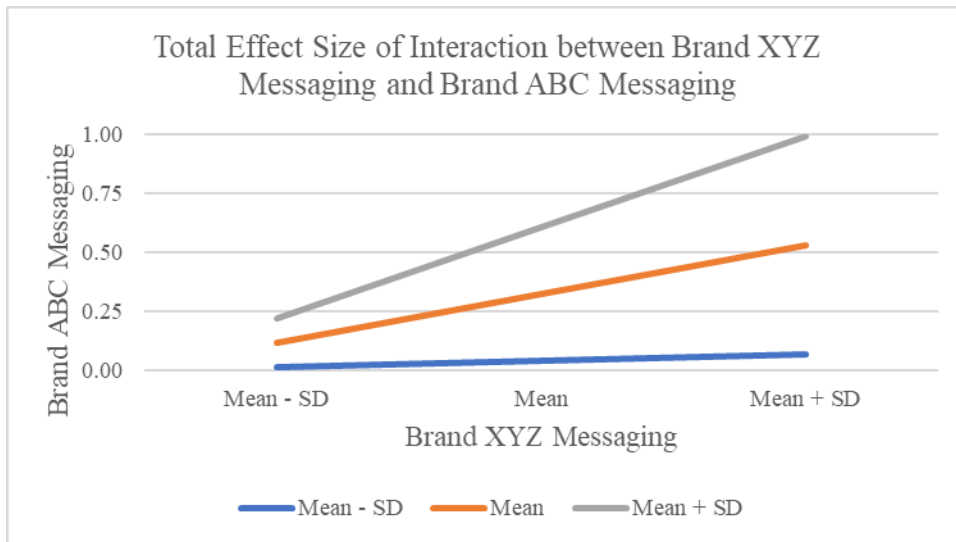
**Figure 3. 2: Google Search Impressions X IFpG Factor**



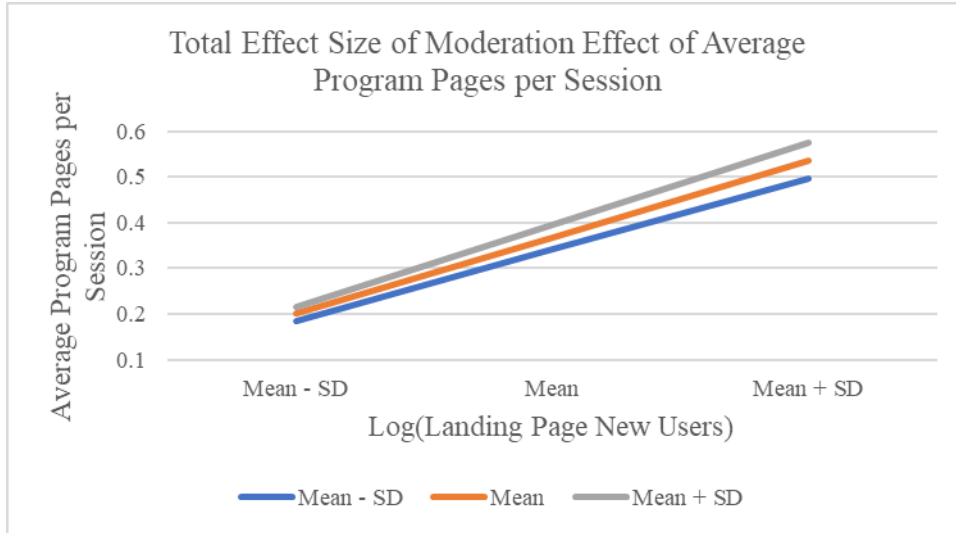
**Figure 3. 3: Google Search Impressions X LT Factor**



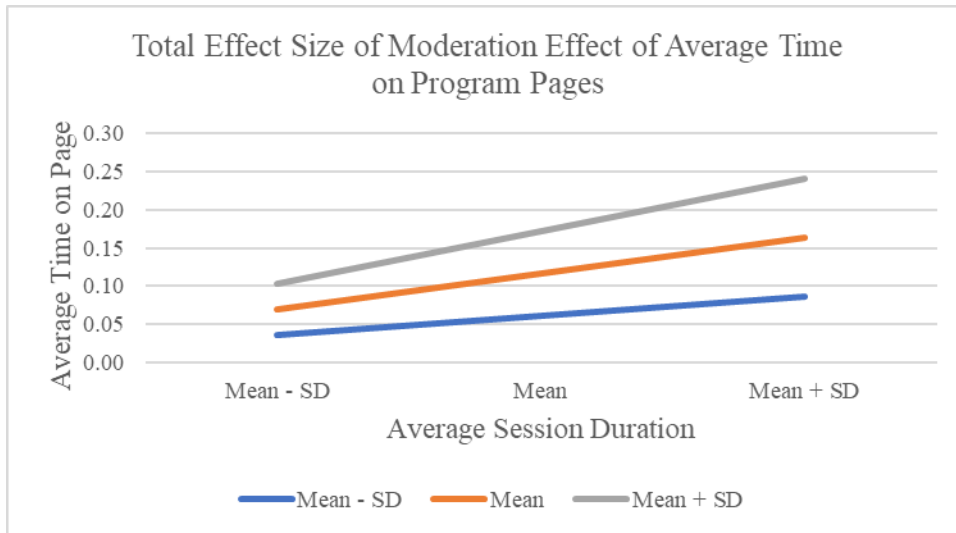
**Figure 3.4: Messaging Copies with Brand XYZ X Messaging Copies with Brand ABC**



**Figure 3. 5: Moderation Effect of Average Program Pages per Session**

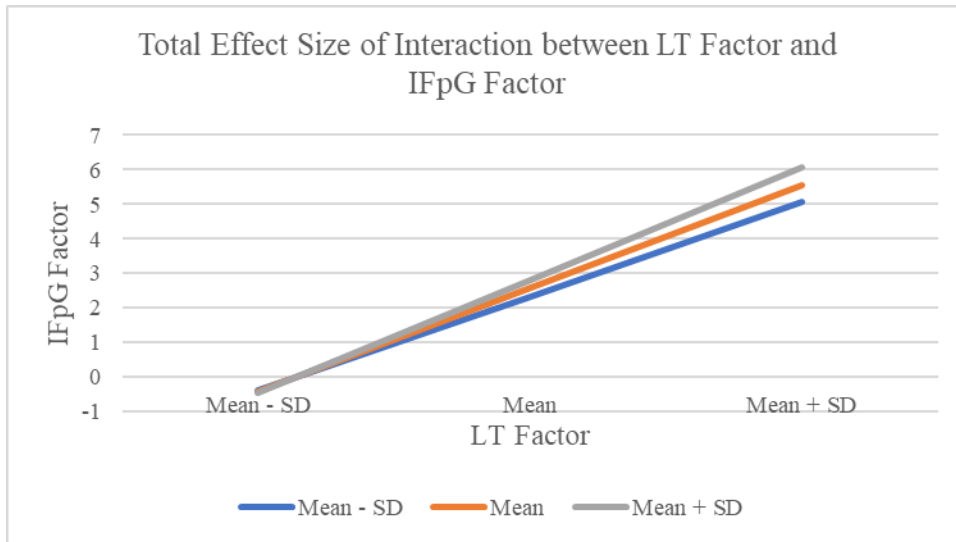


**Figure 3. 6: Moderation Effect of Average time on program pages**

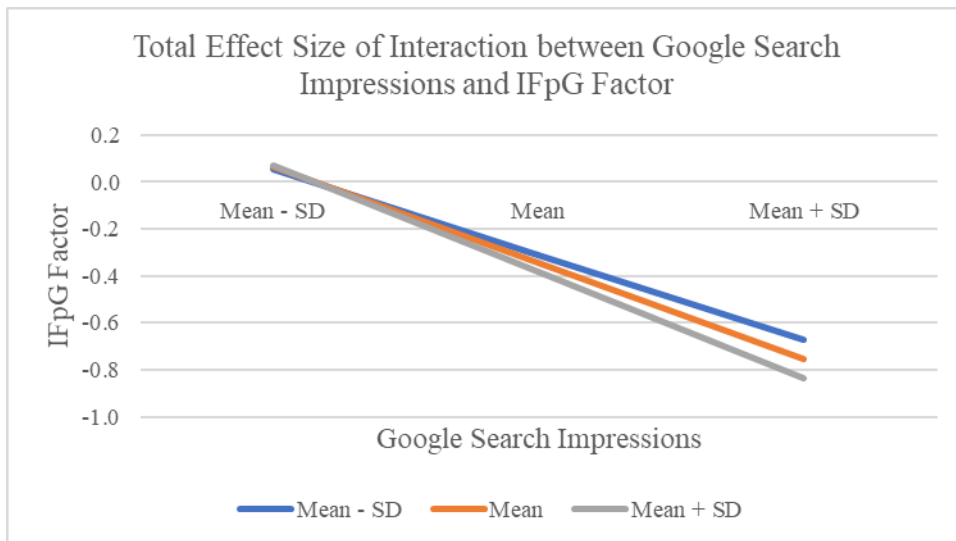


**Figure 4: Total Effect Sizes of Interaction and Moderation Effects – Study 2**

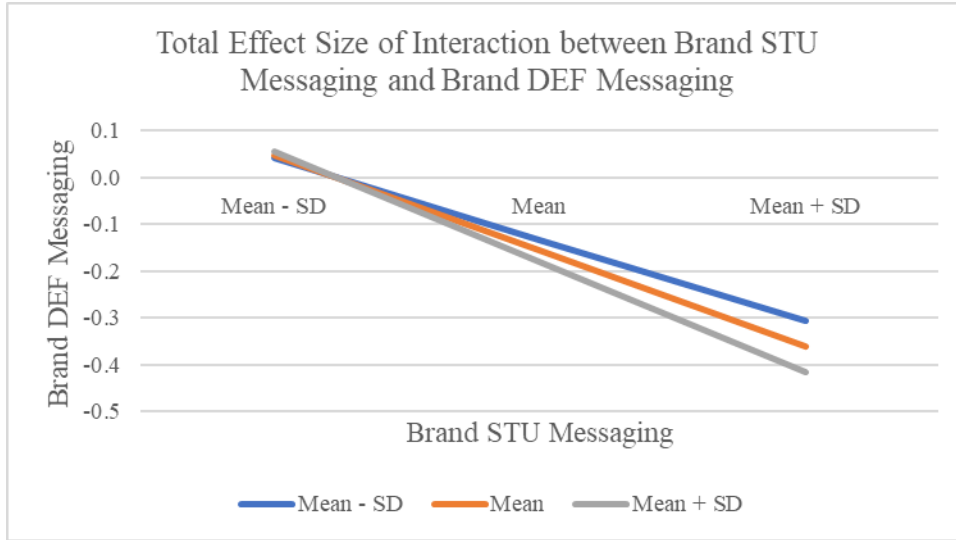
**Figure 4. 1: LT Factor X IFpG Factor**



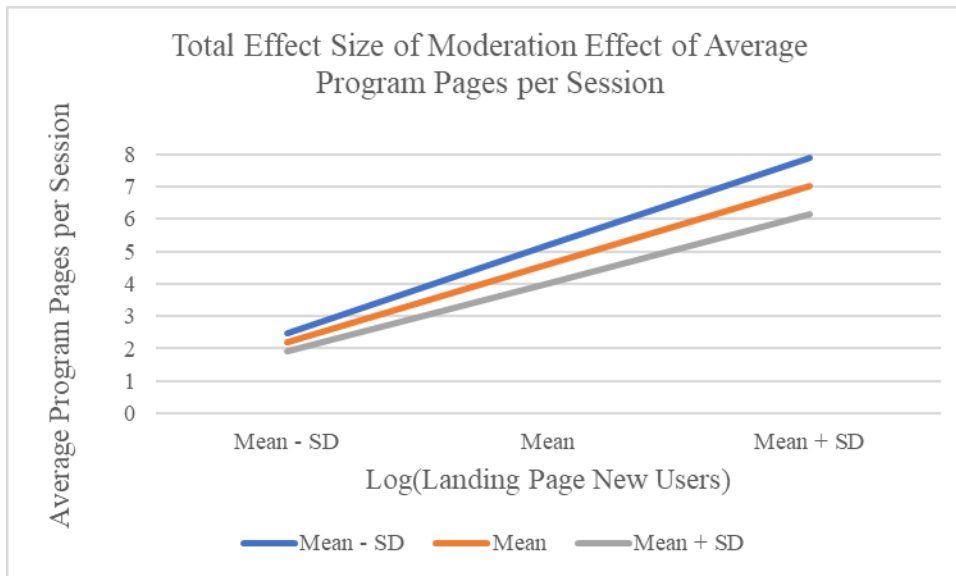
**Figure 4. 2: Google Search Impressions X IFpG Factor**



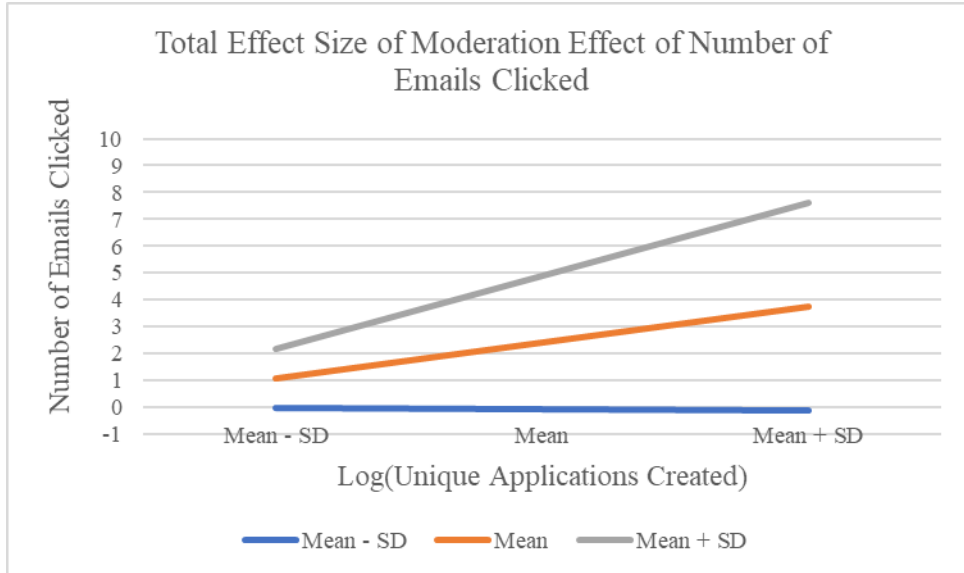
**Figure 4. 3: Messaging Copies with Brand STU X Messaging Copies with Brand DEF**



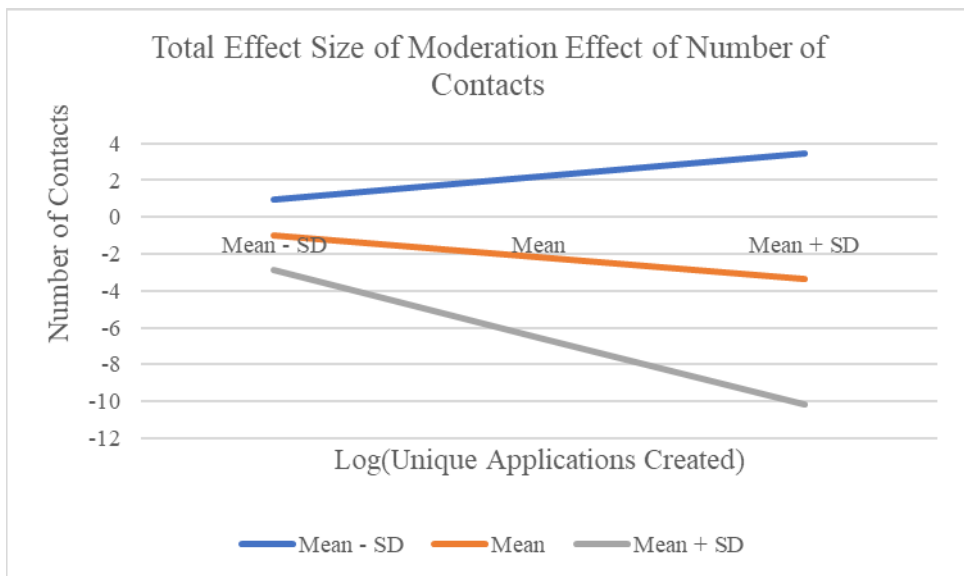
**Figure 4. 4: Moderation Effect of Average Program Pages per Session**



**Figure 4. 5: Moderation Effect of Total Number of Emails Clicked**



**Figure 4. 6: Moderation Effect of Total Number of Contacts**



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## Appendix

### Appendix A: Illustrative Message Hierarchy and Target Persona

Program Value Proposition	Program Core Messaging Themes	Proof Points for These Messages	Assets Required	Target Audience
<p>Who is the program for?</p> <p>What students hope to achieve</p> <p>What the program provides</p>	<p>Why ABC</p> <p>Why this program</p> <p>How does the program benefit students</p>	<p>Real world learning opportunities</p> <p>Special projects</p> <p>Program relationships with industry</p> <p>Employer quotes</p> <p>Industry needs</p> <p>Statistics</p>	<p>Video testimonial</p> <p>Customer quotes</p> <p>Infographics</p> <p>Print materials</p> <p>Email</p> <p>Blog</p> <p>News stories</p>	<p>Audience Story: What paths do students follow to come to ABC?</p> <p>What is their direction after graduation?</p> <p>Gender (%)</p> <p>Domestic/International (%)</p> <p>Domestic Full-time/Part-time (%)</p> <p>Average age of students</p> <p>Years of work experience</p> <p>Originally ABC Undergraduates</p> <p>What information sources do students engage with?</p> <p>Social media platforms, websites, journals/magazines, relevant professional associations, and any feeder schools for this program</p>

## Appendix B: XYZ's Marketing and Communications Plan for Master of Science in Analytics Program

Value Proposition for Master of Science in Analytics Program			
<b>Program Value Proposition</b>	For students who aspire to become data scientists, and to engage in applied research through a STEM-based program, in a business school teaching quantitative and computer science skills. Solves the knowledge gap for highly valued talent required to solve business problems through deep data analytics, learning to handle unstructured data through machine learning on our Hadoop Cluster.		
<b>Core messaging themes</b>	<p><b>Why XYZ?</b>            INNOVATION LABS:</p> <ul style="list-style-type: none"> <li>• Institute for Insight</li> <li>• Legal analytics</li> <li>• Fintech</li> <li>• Social media Lab (forthcoming)</li> <li>• Operations Lab (forthcoming, name unsure as yet)</li> </ul> <p>LOCATION: *City PQR* as a technology city and *neighborhood JKL* a great location for business connections            BUSINESS &amp; TECHNOLOGY: Only business school in our market with a computer science department within it</p>	<p><b>Why MSA program?</b></p> <ul style="list-style-type: none"> <li>• REAL WORLD BUSINESS DATA - Learn how to capture and handle unstructured data and to organize and analyze text and images to create new *business solutions through Sprints</li> <li>• SKILLS TAUGHT: machine learning, R, Python, Hadoop Cluster/Spark*</li> <li>• APPLIED RESEARCH vs just lectures and networking</li> <li>• QUANTITATIVE DEGREE IN ANALYTICS located within a business school - Students understand both technical and business sides of analytics</li> <li>• STEM designation within a business school (Useful for international students)</li> </ul>	<p><b>How does the program benefit students?</b></p> <ul style="list-style-type: none"> <li>• Pathway to an emerging field with strong job prospects</li> <li>• Flexible format: full time and part time options, allowing students to pursue their degree fast and enter the market, or work while learning.</li> <li>• Well-rounded students that have technical and business skills - training and experience at the intersection of disciplines necessary to capture, analyze, and generate meaningful business insights from big data. In addition, management skills with the right balance of <i>business judgment and statistical skills to translate analysis into insight and action.</i></li> </ul>
<b>Target Audience / Need</b>	<ul style="list-style-type: none"> <li>• Early career domestic individual looking to transition into the analytics.</li> <li>• Need skill development and strong relationship with business for career opportunity</li> <li>• Needs a pathway to analytics program through pre-program boot camp</li> </ul>	<ul style="list-style-type: none"> <li>• International students with strong quantitative skills looking for a STEM program with a pathway to employment in the US</li> <li>• Needs job placement in the US</li> </ul>	<ul style="list-style-type: none"> <li>• Highest Priority - Mid career individuals working in the data science field looking to advance their skills</li> <li>• Career mentoring, skills advancing, networking</li> <li>• May need bootcamp to cross entry barrier</li> </ul>

Value Proposition for Master of Science in Analytics Program		
<b>What we want to communicate (Outcomes)</b>	<ul style="list-style-type: none"> <li>• Pursue your degree while you start your career</li> <li>• Opportunities to apply technical concepts to actual business problems.</li> <li>• MSA administered by XYZ’s Institute for Insight, a collaborative community of graduate students, faculty members, researchers, entrepreneurs and industry partners, all focused on preparing students to walk confidently into the fast-changing world of big data analytics.</li> </ul>	<ul style="list-style-type: none"> <li>• Pursue an internship for credit for up to two semesters within the program.</li> <li>• Utilize the XYZ network and career advancement center to find potential employment in the US after graduation.</li> <li>• learn how to truly understand Big Data by pinpointing underlying patterns, predicting the future, and harnessing that power to improve people’s lives</li> </ul>
<b>Proof points for these messages</b>	<ul style="list-style-type: none"> <li>• Pursue your degree while you continue working - Apply what you’re learning to your current job ensuring skill growth and the potential for career advancement</li> <li>• Range of data-driven jobs across a variety of sectors such as data science, quantitative marketing analysis, credit risk analysis, predictive modeling, health informatics and web analytics, Head of analytics, analytic consultants, data strategists</li> </ul>	
<b>Assets Required</b>	<ul style="list-style-type: none"> <li>• Insight sprint – restaurant project –looking for business insight, how does this work for a company?</li> <li>• Suntrust – Predict loan customers that close – looking at the phone conversations or in salesforce notes to identify when we’re at risk. Proof of concept to bring new research to markets. Liked our program so much they hired 5 of our students to develop project across business.</li> <li>• STARR Companies – MBA alumni CIO – AIG – long relationship, gave us 500K to run sprints and hire students out of the program. Understanding our relationship with companies helps serve as a proof point.</li> <li>• Employer quotes - like the email from Cox, a Linked-In post from Starr companies</li> <li>• <i>U.S. News &amp; World Report</i> ranks our graduate and undergraduate computer information systems programs in the top 10 in the nation. In 2015, the <i>UT Dallas Research Productivity Index</i> ranked us #1 for a rise in research productivity ranking among the top 50 U.S. business schools in the last five years.</li> <li>• ROI Data &amp; Placement numbers</li> </ul>	
<b>Assets Required</b>	Video testimonial, student quotes, employer quotes, infographics, program brochure, email, blog	
Target Audience Persona for Master of Science in Analytics Program		
<b>Target Audience / Need</b> <i>Do you have more than one type of student? Tell us about them:</i>	Highest Priority - Mid career individuals working in the data science field looking to advance their skills	Second Priority Audience - Early career domestic individual looking to transition into the analytics.
<b>Audience Story</b> <i>What paths do your students follow to come to XYZ? - And what is their direction after graduation?</i>	Pursue your degree while you continue working Apply what you’re learning to your current job ensuring skill growth and the potential for career advancement Job title data scientists, data strategists, data analysts	Pursue your degree while you start your career Utilize career services to transition into an analytics role during or upon completion of the program Head of analytics, analytic consultants, data strategists

<b>Target Audience Persona for Master of Science in Analytics Program</b>			
<b>Gender :</b>	Male: 67%	Female: 33%	
<b>Domestic / International :</b>	Domestic 25%:	International: 75%	
<b>Domestic Full-time / Part-time :</b>	Full-time: 50%	Part-time: 50 %	
<b>Average age of students /years of work experience:</b>	Age: 27-32	# of Years Work Experience: 5-10 years	
<b>What information sources do your current students engage with that we could use to reach potential new students?</b>	Social media platforms e.g. Facebook, Twitter, LinkedIn, Instagram	Websites	Journals /Magazines
<b>Relevant Professional associations</b>	Meet up groups (R, Python, Machine Learning), TAG, Data Science *city PQR*		

### Appendix C: Descriptive Statistics and Correlations – Study 1

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. log(landusers)	4.055	1.848															
2. log(appcrunique)	2.005	1.009	.134														
3. log(appsubunique)	1.228	0.899	.193**	.841**													
4. litwimp (in 10,000s)	4.918	7.254	.481**	.365**	.331**												
5. igfbgpassimp (in 10,000s)	3.706	8.610	.484**	.082	.136	.353**											
6. gsimp (in 10,000s)	0.392	0.909	.487**	.215**	.258**	.418**	.791**										
7. landretusers	18.238	28.479	.549**	.165*	.240**	.344**	.700**	.638**									
8. brandXYZ	34.702	21.950	.536**	.124	.107	.371**	.078	.027	.214**								
9. brandABC	0.649	1.454	.259**	.443**	.374**	.205**	.145*	.214**	.202**	.216**							
10. info	35.005	18.726	.692**	.154*	.156*	.526**	.329**	.223**	.343**	.815**	.181**						
11. progpps	4.337	1.638	.476**	-.102	-.072	.108	.026	-.051	.073	.344**	.039	.370**					
12. totalleads	10.949	19.542	.493**	.303**	.329**	.635**	.657**	.783**	.506**	.091	.134	.345**	-.027				
13. cta	23.063	15.840	.484**	.225**	.220**	.292**	.145*	.177*	.347**	.668**	.332**	.609**	.202**	.166*			
14. progtop	90.688	43.165	.406**	-.026	.064	.104	.069	.089	.097	.286**	.047	.305**	.550**	.104	.247**		
15. progressdur	240.274	96.318	.565**	-.020	.016	.212**	.077	.035	.116	.415**	.098	.489**	.731**	.119	.335**	.533**	
16. weekdummy	0.149	0.357	.073	.267**	.296**	.138*	.137*	.128	.121	.051	-.104	.081	-.135	.146*	.018	.008	-.067

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

*Note:* The mean value of *litwimp* is the average of the number of impressions on LinkedIn and Twitter. The mean value of *igfbgpassimp* is the average of the number of impressions on Instagram, Facebook, and passive Google channels.

### Appendix D: Descriptive Statistics and Correlations – Study 2

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. log(landnusers)	5.349	2.797																	
2. log(apperunique)	1.580	0.880	-.030																
3. log(appsubunique)	0.528	0.752	-.047	.446**															
4. litwimp (in 10,000s)	4.724	5.513	.387**	.294**	.175**														
5. igfbgpassimp (in 10,000s)	45.636	53.329	-.113**	.363**	.220**	.119**													
6. gsimp (in 10,000s)	0.390	0.461	-.060	.300**	.170**	.177**	.192**												
7. landretusers	198.686	227.618	.557**	.102*	.055	.508**	.135**	.310**											
8. brandSTU	0.909	1.190	.006	.035	-.007	-.184**	.191**	.022	.039										
9. brandDEF	31.159	24.627	.064	.369**	.127**	.255**	.111**	.397**	.210**	-.130**									
10. info	4.278	7.476	-.013	-.019	-.003	.136**	.035	.053	.219**	.060	.087*								
11. progpps	19.188	12.876	.734**	-.214**	-.136**	.254**	-.247**	-.176**	.290**	-.162**	-.027	.121**							
12. totaleads	27.731	34.615	-.079*	.322**	.377**	.295**	.478**	.122**	.079*	-.016	.156**	.082*	-.145**						
13. cta	4.968	11.887	.003	-.035	.001	-.064	.059	-.006	.069	.291**	.166**	.516**	0.023	0.069					
14. progtop	641.505	371.387	.870**	.068	-.025	.337**	-.115**	-.073	.397**	-.020	.105**	-.076	.601**	-.115**	0.027				
15. progressdur	989.987	637.640	.785**	.008	-.050	.314**	-.131**	-.088*	.365**	-.024	.078	-.053	.647**	-.110**	-.001	.794**			
16. totalemailsclicked	102.207	165.549	-.042	.579**	.266**	.221**	.129**	.286**	.064	-.046	.316**	.014	-.124**	.157**	-.0059	-.0003	-.0017		
17. totalcontacts	1061.638	1524.638	-.021	.632**	.311**	.219**	.171**	.331**	.088*	.012	.314**	-.026	-.131**	.212**	-.0071	0.006	-.0010	.886**	
18. weekdummy	0.107	0.310	-.008	.254**	.602**	.093*	.070	.057	.013	-.092*	.067	-.091*	-.0060	.256**	-.0070	-.0022	-.0044	.214**	.236**

\*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).  
**Note:** The mean value of *litwimp* is the average of the number of impressions on LinkedIn and Twitter. The mean value of *igfbgpassimp* is the average of the number of impressions on Instagram, Facebook, and passive Google channels.