Initial Comparison of the Two Types of Hypotheses

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This paper discusses the two types of research studies—qualitative and quantitative studies and how they differ from each other concerning hypothesis generation and testing. An in-depth case analysis is given of each research methodology, which should help the reader gain familiarity with the differences in these methodologies. Finally, a conclusion reiterates the differences between these methodologies and how each relates to research hypotheses.

**Qualitative Studies vs. Quantitative Studies**

The goal of a qualitative study is to “understand social phenomena in natural (rather than experimental) settings” (Huston & Rowan, 1998, p. 2454). One main difference between qualitative and quantitative studies lies in the result: the result of a qualitative study is hypothesis-generating, while the result of a quantitative study is hypothesis-testing (Huston & Rowan, 1998).

Perhaps an example will help better illustrate this. Consider the scenario given by Huston and Rowan (1998); the results of a quantitative study show how women can realize significant health benefits from hormone replacement therapy (HRT), yet few women have implemented this new therapy. Why is this the case? Such is a question for qualitative research.

**Questions Posed**

In fact, “Why is this happening?” and “What is going on?” and “What variations exist?” are all questions posed by qualitative research. Questions such as, “How many?” or “How much?” or “How often?”, on the other hand, are questions posed by quantitative research. Qualitative research is an “interpretive science that seeks to explain social and psychological phenomena” (Huston & Rowan, 1998, p. 2454). Contrast this with quantitative research, which is not *interpretive* but *statistical* in its analyses (Huston & Rowan, 1998).

**Philosophical Base**

Each research method is rooted in its own philosophy. Qualitative research is rooted in *phenomenology*, which is the study of phenomena, while quantitative research is rooted in *positivism*, which is the study of natural phenomena as verified by the empirical sciences. (“Definition of POSITIVISM,” n.d.). As such, the goal of qualitative research is *concept development,* while the goal of quantitative research is *verification.* In qualitative research, the researcher is more *involved*, while in quantitative research, the researcher is more *distant* (Huston & Rowan, 1998).

**Sampling Techniques**

The information collection methods in qualitative research include observations, interviews, and small-group processes. One common method of observation, participant observation, entails researcher involvement in the social phenomena studied. Such involvement allows the researcher to act as a trusted source that can bring about insightful answers to interview questions (Huston & Rowan, 1998).

A focus group, in a qualitative study, is an interview with a select number of people. While study populations and sample sizes are often *numerous* and *random* in quantitative studies, study populations and sample sizes in qualitative studies are often *few* and *purposeful;* The approach in qualitative studies is *inductive*, where analysis moves from the specific to the general. In quantitative studies, the approach is *deductive,* moving from a generalized principle to a true and specific conclusion (Huston & Rowan, 1998). A few examples will help illustrate these concepts.

**Qualitative Research: A Case Study**

Consider, for instance, the qualitative study of Kiener (2019), who “examined the effects of a season-long mental skills training program on a midwestern Division II wrestling team” (p. 351). The participants in Kiener’s qualitative study were 28 student-athletes from a medium-sized university in the Midwest. Kiener (2019) utilized open-ended questions to capture the “unique and complex experiences of the participants while collecting data in the natural setting” (p. 353).

**Prior Research**

Prior research paved the way for Kiener’s study. Kiener describes a study by Shannon et al. (2012), where the mental training routines of six Olympic gold medalists across a variety of sports were analyzed. The data collection methods in this study included semi-structured interviews lasting approximately 50 minutes, occurring over the phone. Four common mental techniques emerged from the result of this qualitative study: performance imagery, positive self-talk, goal setting, and focusing on the task and remaining present in the moment (Shannen et al., as cited in Kiener, 2019).

Additionally, Kiener (2019) describes how Drees and Mack used a quantitative study to investigate the mental toughness of 54 high school wrestlers through one season. The result of this research found significant differences existed between both seniors and freshmen, and “wrestlers with winning records had higher levels of mental toughness than wrestlers with losing records” (Drees & Mack, as cited in Kiener, 2019, p. 352).

**Data Collection Techniques**

Further data collection methods in Kiener’s study included student-athlete journals, observations of trainings and competitions, and post-season evaluations. The student-athletes were monitored for how well they were embracing the mental skills training, their practicing techniques, and how well they formed as a team. Post-season evaluations were used to determine how and if the wrestlers benefitted from the training (Kiener, 2019).

**Findings**

Kiener (2019) found that the training helped wresters self-diagnose their performances, as well as create an action plan for improvement. Many athletes found the mantras created during mental skills training to be beneficial in helping them prepare for competition and to stay focused. Others found the skills helpful in enabling them not to internalize any bad performances (Kiener, 2019).

Kiener (2019) writes, “The findings show evidence that participating in mental skills training was embraced by the team as a valued component of athlete development and contributed to team cohesion and tradition. Moreover, individual student-athletes were able to demonstrate proactive cognitive strategies, such as self-diagnosing areas of improvement, self-talk, negative thought stopping, and utilization of mantras to remain focused” (p. 357).

As such, Kiener (2019) was able to document the experiences of collegiate wrestlers participating in mental skills training, and provide the groundwork for future quantitative studies that might follow. Qualitative studies often provide the groundwork for quantitative studies.

**Quantitative Research: A Case Study**

As mentioned previously, the goal of quantitative research is verification. Quantitative research makes use of the Null Hypothesis Significance Test (NHST) to either reject or accept the null hypothesis (Levine, Weber, Hullett, Hee Sun Park, & Lindsey, 2008). When creating a hypothesis test, the common assumption is that there is no difference between any two sample means. Such is referred to as the null hypothesis (when there is no difference between any two sample means) (Dietrich, Heller, Yang, & EMC Education Services, 2015). The alternative hypothesis typically reflects a researcher’s predictions (Levine et al., 2008).

After collecting data, the researcher can calculate the difference between means and a t-statistic. The t-statistic can be used along with the p-value to determine the likelihood of such a scenario occurring. If the probability of a t-statistic occurring falls outside of the pre-determined significance level, the researcher can reject the null hypothesis in favor of the alternative hypothesis (Dietrich et al., 2015).

Such is not to say that NHST and quantitative research are not without faults. Certain types of statistical significance can be obtained just by increasing or decreasing the sample size. As a sample size becomes larger, the chance for Type I errors increases, and as a sample size becomes smaller the chance for Type II errors increases. Also, the null hypothesis in the social sciences is almost always false. Thus, disproving it may be seen as unimpressive and uninformative (Levine et al., 2008). Nevertheless, NHST and quantitative studies are a prominent factor in scientific research.

Consider the quantitative study of Bình Nghiêm-Phú (2019), who set out to realize, “What determines the loyalty of airline passengers?” Specifically, the study aims to “verify a deductive linear model which incorporates the variables to describe perceived airline service quality, perceived value for money, overall satisfaction, and loyalty” (Bình Nghiêm-Phú, 2019, p. 25).

**Prior Research**

A review of the literature by Bình Nghiêm-Phú (2019) shows how airline service quality has been identified as a multi-factor construct in several other studies, yet no universal consensus exists as to the structure of airline service quality. Some common factors include flight comfort, safety, staff attitude, cleanliness, waiting time, conduct, experience, and convenience (Bình Nghiêm-Phú, 2019).

Bình Nghiêm-Phú (2019) lists several studies that have found statistical significance between airline service quality and air passengers’ perceived value for money, satisfaction, and loyalty. Studies conducted by Kuo and Jo (as cited by Bình Nghiêm-Phú, 2019), for example, found losses and gains in service quality had significant impacts on perceived value and loyalty for Taiwanese air passengers.

**Data Collection Techniques**

Bình Nghiêm-Phú (2019) collected quantitative data from airline passenger reviews posted on airlinequality.com. This database involves 127 airlines of all rankings (0, 2, 3, 4, and 5 stars). There were no 1-star airlines used in this study. Additionally, evaluations were provided to all types of travelers (business, couple leisure, family leisure, and solo leisure) in all types of cabins (economy, premium economy, business class, and first-class) on both direct and connecting flights (Bình Nghiêm-Phú, 2019).

All of the reviews were written in English and collected between July 2014 and August 2016. In total, 3,216 evaluations were collected. Participants rated the airlines on criteria like seat comfort, cabin staff service, food and beverages, in-flight entertainment, ground service, and Wi-Fi connectivity. The data was then grouped by traveler type, cabin type, route type, airline type, and ranking. 127 airlines around the world were analyzed (Bình Nghiêm-Phú, 2019).

**Hypotheses**

The hypotheses generated in this research studied are listed as follows:

* H1: Passenger evaluation of airline service quality significantly affects their perceived value for money, overall satisfaction, and loyalty.
* H2: Passenger evaluation of perceived value for money significantly affects their overall satisfaction and loyalty.
* H3: Passenger overall satisfaction with airline service quality significantly affects their loyalty.
* H4: Passenger evaluations of airline service quality, perceived value for money, overall satisfaction, and loyalty differ between/among the (a) types of travelers, (b) cabin types, (c) route types, (d) airline stars, and (e) traditional and low-cost airlines (Bình Nghiêm-Phú, 2019, p. 28).

As you can see, this study provides four alternative hypotheses. There was not a null hypothesis given in this study. The null hypothesis would be that there is no difference between passenger evaluations of airline service quality and any of the other factors being investigated. This study makes use of several statistical methods, including ANOVA analysis of variance to analyze the results (Bình Nghiêm-Phú, 2019).

**Findings**

“Wi-Fi/connectivity” was found to be the only service quality variable that did not significantly affect either perceived value or overall satisfaction among participants. Perceived value for money turned out to be the most important factor in identifying overall satisfaction. Additionally, “cabin staff service” turned out to be the only service quality that could generate a significant impact on customer loyalty. Bình Nghiêm-Phú (2019) writes, “H1 and H2 were supported, while H3 was partially supported” (p. 29). H4 was found to be partially supported as well (Bình Nghiêm-Phú, 2019).

Solo leisure travelers turned out to be the most generous evaluators, and business and first-class passengers were happiest when recalling their experiences. Four and five-star airlines were also seen as offering customers the best value for money and overall satisfaction. As a result, customers are more likely to be loyal to these airlines (Bình Nghiêm-Phú, 2019). In fact, “the human factor (cabin staff service and ground service)”, writes Binh Ngiem-Phu (2019), “is the most important identifier of airline passengers’ perceived value for money, overall satisfaction, and loyalty” (p. 29).

**Conclusion**

As you can see, the analysis performed in this quantitative study is much more statistical than the interpretive analysis performed in the qualitative studies mentioned earlier. The quantitative study offered several hypotheses, which were then tested accordingly. Qualitative studies, on the other hand, are exploratory and are hypothesis-generating (Huston & Rowan, 1998).

The philosophical basis of each methodology forms this distinction; Quantitative studies are based on positivism, while qualitative studies are based on phenomenology. As such, the two serve separate goals; the goal of quantitative research is to verify, while the goal of qualitative research is to develop concepts (Huston & Rowan, 1998).

In effect, these two methodologies might best be used in tandem—a qualitative study to asses the “Why?” and a quantitative study to asses the “How often?”. Many studies utilize this iterative approach to apply the best research methods currently in existence.

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