THE RELATIONSHIP BETWEEN INDIVIDUAL COGNITIVE, BEHAVIOR, AND
MOTIVATION CHARACTERISTICS AND SALES JOB PERFORMANCE

by

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Abstract

The purpose of this quantitative research study is to analyze the relationship between individual cognitive, behavioral, and motivational characteristics and sales quota attainment for three industrial sales organizations in West Virginia. The intent of the study is to learn more about organizational efforts to implement an effective system for hiring to identify top performing talent in order to accomplish sales goals. From a human performance improvement prospective, this research study applies both the Human Performance Improvement / HPT Model (Van Tiem, Moseley, and Dessinger’s (2012) and Gilbert’s (1978) Behavior Engineering Model. The Behavior Engineering Model allowed the researcher to determine which individual characteristics are relevant for the purpose of this study. The Human Performance Improvement/HPT Model further allowed the researcher to define the issue the research study wants to solve as a performance gap: a performance gap in the recruiting approach of sales. Individual cognitive, behavioral, and motivational characteristics of two hundred and thirty-eight sales representatives were assessed using a psychometric assessment tool, the ProfileXT©, that has been extensively validated and reviewed by a panel of experts and can be found in the Mental Measurements Yearbook (Profile International, I., 2007). A stepwise multiple regression was conducted to evaluate which ProfileXT© scale scores were most effective at predicting sales performance. A stepwise multiple regression was conducted to evaluate which ProfileXT© scale scores were most effective at predicting sales performance. The only factor that was significantly related to sales performance was Independence, F (1,236) = 18.286, p < .001. The multiple correlation coefficient was .268, indicating approximately 7.18% of the variance in sales performance could be accounted for by independence alone. Further analysis indicated no other
significant predictor variables from the ProfileXT© scales. The researcher concluded with recommendations for future research.
Dedication

Refer to the *Dissertation Manual* regarding who should be acknowledged in a dedication (this page is often included, although not required, in a dissertation). The Dedication page is numbered, but “Dedication” does not appear in the Table of Contents (note that if the Abstract is two pages long, the page number for the Dedication must be changed to iv).
Acknowledgments

This page is typically included in a dissertation. Refer to the Dissertation Manual regarding who should be acknowledged on this page. The “Acknowledgments” entry does appear in the Table of Contents.
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CHAPTER 1. INTRODUCTION

Introduction to the Problem

Recruiting and selecting top-performing sales representatives has been a challenge for the organizations participating in this research study. The ability to identify top-performing sales talent during the recruiting and selection phase is not sufficient. The intent of the research study was to contribute to the improvement of selection and reduce the number of sales performance issues after sales representatives have been hired. The study answers the question whether there are individual characteristics that allow one to predict sales performance that can be assessed during hiring selection. This would make hiring selection more successful.

To answer the above question, this quantitative, research study analyzed the relationship between individual cognitive, behavior, and motivation characteristics and sales quota attainment for three industrial sales organizations in West Virginia. Because the focus is on contributing to the quality of hiring selection, the present research study ignored environmental factors that influence performance which only come into play once individuals are hired for the position.

The Behavior Engineering Model allowed for determining which factors were relevant for the purpose of this study guiding the selection of the psychometric tool used in the empirical part. The psychometric tool should assess the factors identified as relevant based on Gilbert’s (1978) model. Gilbert (1978) considers individual characteristics that are assessed during hiring selection a low leverage [low impact] for performance improvement and might underestimate the importance of those characteristics for performance. The result of the study will also show if Gilbert’s (1978) assumption is correct or not.

Van Tiem, Moseley, and Dessinger’s (2012) Performance Improvement/HPT Model describes the human performance improvement approach as well as the human performance improvement process. The model illustrated the starting point of human performance improvement as a performance gap. This allowed the researcher to define the issue the research study wanted to solve as a performance gap: a performance gap in the recruiting approach of sales organizations.

Many employers use hiring selection methods to screen salespeople based on the characteristics important to the person doing the interview. As a result, this strategy proves to have little value in predicting job performance outcomes (Schmidt and Hunter, 1998). The difficulties in predicting job performance during hiring selection might explain why selection is considered a low leverage [low impact] in literature on human performance (Gilbert, 1978). On other hand, Dimaculangan and Aguiling (2012) suggested, “recruiting and retaining high-performing salespeople are two major challenges facing sales managers today. The survival of an organization depends on recruitment and selection of salespeople as it provides the foundation for developing an organization.
Performance in the sales sector depends on identification of top-performing talent who are not only qualified to do the job but who also serve as relationship builders and product information consultants. The acquisition of new talent includes recruiting and hiring selection as a first step. Once the role of the sales representatives has been clearly defined, appropriate selection strategies along with recruiting could generate positive outcomes. Failure to identify top-performing sales representatives can be detrimental to any organization. Most organizations place a top priority on the salesperson’s performance (Cravens, Ingram, LeForge, & Young, 1993).

There is little empirical research that helps to describe which position is correct. Law, Schmidt and Hunter (1994) suggested theories of job performance that have been developed to test future job performance require more research to understand more specifically what measureable characteristics impact performance outcomes. The present research study was designed to clarify the relationship between individual characteristics and sales performance in industrial settings. More specifically, the relationships between cognitive, behavior, and motivation characteristics and the attainment of sales quota objectives in three industrial sales organizations in West Virginia was the focus of the study. As a result, the study contributed to the body of knowledge in Human Performance Technology by considering the assumption that selection is low leverage [low impact] when it comes to improving human performance and contributes to the body of knowledge concerning hiring selection methods and their predictive validity for job performance.

In the context of this study: Can job performance of salespersons (measured as sales quota achievement) of 238 sales representatives of three industrial sales organizations in West Virginia be predicted by assessing cognitive, behavior, and motivation characteristics utilizing
the ProfileXT® psychometric assessment tool. The tool consists of different scales that are
designed to measure different factors that add up to the three characteristics: cognitive, behavior,
and motivation. Cognitive characteristics are divided into four factors (verbal skill, verbal
reasoning, numerical ability, and numerical reasoning). Each of the factors has its own scale. In
addition to these four scales Cognitive has a fifth scale (learning index) that is a composite scale
of the four cognitive sub-scales (verbal skills, verbal reasoning, numerical ability, and numerical
reasoning). Behavior characteristics has nine factors (energy level, assertiveness, sociability,
manageability, attitude, decisiveness, accommodating, independence, and objective judgment)
and no composite scale. Motivation characteristics have six factors (financial, people service,
enterprising, creative, technical, and mechanical) and no composite scale. See Table 1 below.

Table 1

<table>
<thead>
<tr>
<th>Individual Cognitive Characteristics (4 factors)</th>
<th>Individual Behavior Characteristics (9 factors)</th>
<th>Individual Motivation/Interest Characteristic (6 factors)</th>
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<tr>
<td>Learning Index (Scale)</td>
<td>Energy Level (Scale)</td>
<td>Financial (Scale)</td>
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<tr>
<td>*Composite of Sub-Scales</td>
<td>Assertiveness (Scale)</td>
<td>People Service (Scale)</td>
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<td>Verbal Skill (Sub-scale)</td>
<td>Sociability (Scale)</td>
<td>Enterprising (Scale)</td>
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<td>Verbal Reasoning (Sub-scale)</td>
<td>Manageability (Scale)</td>
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<td>Numerical Ability (Sub-scale)</td>
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<td>Numeric Reasoning (Sub-scale)</td>
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<td></td>
<td>Objective Judgment (Scale)</td>
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The results could be important to stakeholders when attempting to hire and select the best talent for employment. Performance improvement consultants and practitioners could further review the results and design of the research study to gain additional understanding how psychometric instruments combined with an understanding of performance improvement could help to build reliable hiring selection approaches for identifying top-performing talent. The value of realizing if a relationship exists between cognitive, behavior, and motivation characteristics and sales job performance could be beneficial to sales organizations since organizations may be able to identify early in a recruiting process individuals who might be more likely to be top performers. This research study advanced the field of performance improvement by examining the relationship between these characteristics and sales job performance in three industrial sales organizations in West Virginia. The topic would benefit from further investigation to help hiring managers increase their success rate for identifying top-performing talent in an industrial setting in West Virginia. Topor (2001) pointed out “the understanding of selection factors that strive toward a better understanding of HR practitioners’ decision-making process will not only contribute toward organizational productivity and effectiveness, but will further advance selection overall” (p. 8).

**Background, Context, and Theoretical Framework**

**Background**

The research study had two major components. The first was a profile of each of the three participating organizations, and the second component was the relationship between individual characteristics and sales performance outcomes. The goal of the first component was to identify three industrial sales organizations in West Virginia with similar job descriptions for sales representative. The second component was that the industrial sales representative must
have completed a ProfileXT© assessment between the years 2012-2014. In addition, sales representatives must have been employed for at least one year between the years 2012 - 2014. The participating organizations have been in business over 40 years, and they are West Virginia based sales organizations. One of the three participating organizations has an international presence, while the other two participating organizations have a focus in the United States at this time. The first participating organization is the largest electrical distributor in the United States. The second participating organization is committed to manufacturing and selling a broad range of electrical cables from the manufacturing facilities located in West Virginia, Arizona, and Texas. The third participating organization is the largest industrial supplier to the copper mine industry, and serves its constituents in both the United States as well as internationally. All three participating sales organizations have faced a decrease in sales. While there are many variables, which play a role in these outcomes, the research study specifically focused on one component of recruiting and selection. Currently, there was a need to determine which individual salesperson characteristics have the greatest impact on identifying and recruiting top-performing sales representatives in three industrial sales organizations in West Virginia.

Permissions were given by the appropriate parties’ authorities which is outlined in Appendix B as the Site Permission Letter. It is important to note all data was pre-existing at each of the participating organizations. Sales percent to quota from 2012-2014 along with ProfileXT© assessment results were provided to the researcher by the research assistant. The research assistant signed a confidentiality agreement. See Appendix C. The data was submitted to the researcher via an excel spreadsheet with no individual identifiers.
Context

A psychometric assessment, the ProfileXT© was applied to gain an understanding of the relationship between cognitive, behavior, and motivation characteristics and sales quota results, in an effort to learn more about organizational efforts to implement an effective system for hiring to identify top performing talent. Finding methods for determining what separates top-performing salespeople from average salespeople has culminated in a large body of research on sales (Churchill, Ford, Hartley, & Walker, 1985; Morris, LaForge, & Allen, 1994). In an analysis provided by the Occupational Information Network (O*NET), it was predicted that more than 302,000 salespeople would be needed during the 2012-2022 period. The O*NET is an online database developed by the United States Department of Labor/Training Administration. In order to assist human resource professionals and hiring managers in recognizing top performing salespeople, it is important to provide statistical research into the predictors (Friedman, 2002). In order to do this, it is important to determine what separates top-performing salespeople from average salespeople (Churchill et al., 1985; Morris et al., 1994). Barrick and Mount (1991) suggested past research on psychometric assessments as predictors of job performance has not yielded significant findings. Churchill et al. (1985) and Seymour (1994) proposed determinants of sales performance are job and industry specific.

The research study challenged these findings by searching for significant correlations between individual characteristics (cognitive, behavior, and motivation) and sales performance. Cognitive characteristics are divided into four factors (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Each of the factors has its own scale. In addition to these four scales, Cognitive has a fifth scale (learning index) that is a composite scale of the four cognitive sub-scales (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Behavior
characteristics has nine factors (energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment) and no composite scale. Motivation characteristics has six factors (financial, people service, enterprising, creative, technical, and mechanical) and no composite scale. See Table 1.

**Theoretical Framework**

Currently, a gap exists in the current and desired performance of sales talent in three industrial sales organizations in West Virginia. A decrease in sales quota attainment has raised attention and led to management’s assumption that low sales performance is due to individual characteristics of sales people and that sales performance would increase if the salesperson selection approach would consider individual characteristics appropriately. As a result, there is a need to determine whether individual salesperson characteristics have an impact on sales performance; and therefore, should be considered when identifying and recruiting top-performing sales representatives in three industrial sales organizations in West Virginia.

The research study examined the relationships between sales performance and individual characteristics of salespersons. The characteristics being cognitive, behavior, and motivation. Cognitive characteristics are divided into four factors (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Each of the factors has its own scale. In addition to these four scales Cognitive has a fifth scale (learning index) that is a composite scale of the other four cognitive scales (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Behavior characteristics has nine factors (energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment) and no composite scale. Motivation characteristics has six factors (financial, people service, enterprising, creative, technical, and mechanical) and no composite scale. See Table 2.
Creswell (2005) and Neuman (2003) suggested quantitative, correlational study when exploring relationships between independent and dependent variables.

“In quantitative studies, one uses theory deductively and places it toward the beginning of the plan for a study. The objective is to test or verify theory. One thus begins the study advancing a theory, collects data to test it, and reflects on whether the theory can be confirmed by the results in the study. The theory becomes a framework for the entire study, an organizing model for the research questions or hypotheses for the data collection procedure” (Creswell, 1994, pp. 87-88).

In this study sales performance is the dependent variable and the independent variables are outlined in Table 2 as follows:

Table 2

*Characteristics, Scales, and Sub-scales of the ProfileXT© Outlining Independent Variables*

<table>
<thead>
<tr>
<th>Individual Cognitive Characteristics (4 factors)</th>
<th>Individual Behavior Characteristics (9 factors)</th>
<th>Individual Motivation/Interest Characteristics (6 factors)</th>
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<tbody>
<tr>
<td>Learning Index (Scale)</td>
<td>There is no composite of the nine Individual Behavior Scales, that would serve as an independent variable here</td>
<td>There is no composite of the six Motivation/ Interest Scales, that would serve as an independent variable here</td>
</tr>
<tr>
<td>*Composite of four Sub-scales Independent variable</td>
<td>No Independent variable</td>
<td>No Independent variable</td>
</tr>
<tr>
<td>Verbal Skill (Sub-scale) Independent variable</td>
<td>Energy Level (Scale) Independent variable</td>
<td>Financial (Scale) Independent variable</td>
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<tr>
<td>Verbal Reasoning (Sub-scale) Independent variable</td>
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<tr>
<td>Numerical Ability (Sub-scale) Independent variable</td>
<td>Sociability (Scale) Independent variable</td>
<td>Enterprising (Scale) Independent variable</td>
</tr>
<tr>
<td>Numeric Reasoning (Sub-scale) Independent variable</td>
<td>Manageability (Scale) Independent variable</td>
<td>Creative (Scale) Independent variable</td>
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</table>
With respect to the ProfileXT© psychometric instrument, there is no composite score of cognitive, behavior, and motivation available at this time. While the ProfileXT© is robust and designed to calculate percentage match to a performance model, this was not the intent of this study (Profiles, I., 2014). While the cognitive, behavior, and motivation scales and sub-scales are available for job matching through an examination of the score patterns of current employees who are most successful and least successful in a particular position, this was not the focus of the research study. As a result, the researcher was unable to include the ProfileXT© percent to job match as an independent variable in the study and run the appropriate analysis to investigate correlation with sales performance or, in this case, sales percent to quota across three years against job match.

Grömping (2007) pointed out regression results can be used to make comparative judgment when independent variables produce specific effects on dependent variables. Grömping (2007) further states “regression results are used to inform intervention-related theory” (p. 18). If the independent variables can explain a considerable part of the variance in the dependent variable, these results could be used to improve selection process.

Nathans, Oswald, and Nimon (2012) pointed out “stepwise regression methods are sometimes relied upon to determine a set of independent variables that purportedly represent the
“best” set of predictors of a particular dependent variable” (p. 11). The researcher in the present study used regression analysis to gain an understanding of the relationship between the independent and dependent variables. The regression analysis followed the steps outlined in the framework by Hinkle, Wiersma, and Jurs (2003) and further discussed in the research of Nathans, Oswald, and Nimon (2012). The details are outlined in Chapter 4.

Lastly, the study first developed an idea on how theory could be advanced, formulated hypotheses on how to test this idea empirically, and offered the opportunity for the researcher to analyze a set of existing data. The fact that sales quota are not met can be described as a performance problem of the salespersons. Management’s assumption that low sales performance results from an insufficient selection approach can be described as a performance problem of selection. There is an existing body of knowledge on Human Performance: namely the field of Human Performance Technology. Further, there is a body of knowledge on employment selection methods and their predictive validity. Bringing Human Performance Technology and research on selection methods together allows for a more sophisticated view on human performance improvement that can be tested empirically.

The field of Human Performance Improvement offers many tools and techniques for studying a particular issue or phenomenon (Pershing, 2006; Gilbert, 2007; Rossett, 2009). The present research study was based on two models, Gilbert’s (1978) Behavior Engineering Model and Van Tiem, Moseley, Dessinger’s (2012) Performance Improvement/HPT Model. The remaining part of the chapter will elaborate this in detail.

**Gilbert’s Behavior Engineering Model.** The purpose for selecting Gilbert’s (1978) Behavior Engineering Model is that Gilbert provides a model that systematically outlines the factors that influence human performance, in the case of this research study, sales performance.
Gilbert’s Behavior Engineering Model focuses on six key factors: information, resources, incentives, knowledge, capacity, and motives (Gilbert, 1978; Gupta, Govindarajan, & Malhotra, 1999; Van Tiem, Moseley & Dessinger, 2001). The six key factors were grouped into Environmental Supports (Data, Resources, and Incentives) and Person’s Repertory of Behavior (Knowledge, Capacity, and Motives). See Figure 1. Gilbert (1978) designated environmental supports as $E$, and people’s repertory of behavior as $P$. Further Gilbert (1978) refers to the environmental supports as data ($E_1$), resources ($E_2$), and incentives ($E_3$) and Person’s Repertory of Behavior supports as knowledge ($P_1$), capacity ($P_2$), and motives ($P_3$).


Gilbert (1978) suggested a person’s repertory of behavior ($P$) are individual characteristics of a person that they bring to their jobs. Whereas knowledge in Gilbert’s (1978)
Model is of lesser importance for selection because it can be trained; capacity and motives in Gilbert’s (1978) Model are explicitly connected to selection. As a result, Gilbert’s (1978) Model explains what to assess when individual characteristics should be assessed for sales positions. Still, when it comes to human performance improvement, Gilbert (1978) has a clear opinion where the leverage for improvement can be found:

“…no person or environment is likely to be perfectly designed for the accomplishments expected. Even under ideal circumstances, some improvement in behavior will be possible. Then the question is not if we can improve this or that aspect of behavior, but which strategies will yield the most worthy results: the greatest improvement in accomplishment with the least cost of behavior. The question is, where is the greatest leverage? I am saying that most people have both sufficient motive and capacity for exemplary performance in almost all circumstances of work and school. So, we should look to these variables only when we have exhausted other remedies. If you have done a great job in correcting defects of information, tools, incentives, and training, and you still have not achieved exemplary performance (…) then you can sensibly worry about the selection of people who have greater motives or capacity” (p.89f).

In the above quotation, Gilbert does not provide empirical support concerning his statement that “most people have both sufficient motive and capacity for exemplary work”. The lack of empirical support regarding Gilbert’s statement is understood as an opinion when he states, “I am saying…” as referenced above.

In contrast to Gilbert’s (1978) opinion, research suggested (Blumberg & Pringle, 1982) recognized capacity as a major component of performance and a strong relation between capacity and selection. Spitzer (1990) suggested in order to be a top performer in a particular
position an individual’s capacity has to match the position. An inefficient recruiting and hiring selection system results is additional costs to the organizations (Leibler & Parkman, 1992). Spitzer’s (1990) research suggested capacity-related performance challenges have roots in the selection process. McCormick and Ilgen (1985) suggested performers make choices for performance within the limits of their capabilities.

Many scholars have studied performance of individuals as it relates to motivation. Vroom (1964) developed the first theory suggesting “the strength of the tendency to act in a certain way depends on the strength of an expectancy that the act will be followed by a given consequences (or outcome) and on the value or attractiveness of that consequence (or outcome) to the actor” (p. 45). Vroom’s theory was concerned with predicting an individual’s motivation to work. In a meta-analysis on motivation and the relationship to performance, Churchill, Ford, and Walker (1976) found a positive correlation coefficient of .258 which suggests motivation is a predictor of performance. Churchill et al. (1997) defined motivation as “the amount of effort the salesperson desires to expend on each activity or task associated with the job” (p. 35). Locke and Latham (1990) based their theory of motivation on expectancy theory which explained “performance is based on the belief that the work effort will result in improved performance (p. 12).

Vinchur, Schippmann, Switzer, & Roth (1998) more recently discovered conscientiousness as a strong predictor of sales performance. The findings further suggest motivation as a strong predictor of sales performance (Vinchur et al., 1998). Sansone and Harackiewicz (2000) found “motivation directs certain behaviors toward achieving a specific goal” (p. 450). Barrick, Stewart, and Piotrowski (2002) have identified the importance of the cognitive process in motivation. Locke and Latham (1990) stated that “[a]lthough cognition and
motivation can be separated by abstraction for the purpose of scientific study, in reality they are virtually never separate” (p. 10.). Mitchell (1997) defined motivation as “those psychological processes involved with the arousal, direction, intensity, and persistence of voluntary actions that are goal directed” (p. 60). As a result, motivational constructs can be measured. In this research study, motivational measures were self-reported thus providing a limitation as a predictor of performance.

Capacity and motives might not be such a small leverage as Gilbert (1978) assumes. To test this, one has to show that individual characteristics, like capacity and motives, are a valid predictor of performance and that they explain a considerable part of the variation in individual human performance. If this were the case, the use of assessment tools that assess individual characteristics would not only improve hiring selection but also have leverage in engineering human performance.

Because this study was used to examine if individual characteristics are a leverage for performance and should be considered more than current human performance technology literature suggests, especially during selection, the environmental support part of the model is not relevant for this study (Gilbert, 1978). All the more important is the Person’s Repertory of Behavior part of Gilbert’s (1978) Behavior Engineering Model. Gilbert suggested (1978) that knowledge, capacity, and motives are the individual factors that influence performance” (p. 88). Because it can be trained, knowledge of Gilbert’s (1978) model is of minor importance for hiring selection. See P1 Box in Figure 1. Capacity and motives in Gilbert’s (1978) model were explicitly connected to hiring selection even though Gilbert considered capacity and motives to be low leverage [low impact]. See P2 and P3 in Figure 1. Gilbert (1982) referred to capacity as “the physical, intellectual, and emotional ability of the performer.” Gilbert (1982) further
described motivation as the attitude toward one’s job and factors related to employee satisfaction.

**Van Tiem, Moseley, & Dessinger Performance Improvement/HPT Model.** The Performance Improvement/HPT Model (Van Tiem, Moseley, & Dessinger, 2012) is a comprehensive description of the performance improvement approach. The model and other research suggest that the starting point of any performance improvement effort should be the definition of the performance gap (Robinson and Robinson, 1995; Swanson, 1994). Spitzer (1990) suggested “individual performance and its factors that affect performance are the main subject of performance analysis” (p. 13). Rosenberg (1990) described performance analysis as the “recognition of a performance gap” (p. 43). Within this frame of reference, the present research study utilizes the Performance Improvement/HPT Model to describe the performance gap. See Figure 2.

![Figure 2. Performance Improvement/HPT Model.](image-url)
Figure 2 shows the six segments of the model: analysis, intervention selection, design and development, implementation and maintenance, and evaluation. Van Tiem, Moseley, and Dessinger (2001) described human performance technology as ‘the science and art of improving people, process, and performance’ (p. 2). Utilizing the Performance Improvement/HPT model was a starting point for guiding future recommendations upon completion of the research. Furthermore, the Performance Improvement/HPT model recognizes that environmental and individual factors change guiding the development of interventions. The model has implications for practice to provide the structure and theoretical base to increase the level of awareness for industrial sales organizations. By utilizing the Performance Improvement/HPT model in future research studies, a deeper understanding of individual factors contributing to performance of sales representatives could be identified. In addition, along with the performance analysis of the Human Performance Improvement Model (Van Tiem et al., 2004), discrepancies in the actual performance and desired performance could also be known.

The first phase of the Performance Improvement/HPT model is performance analysis. Rosenberg (1996) and Rothwell (2000) defined this as “the process of identifying the organization’s performance requirements and comparing them to its objective and capabilities.” Performance analysis as described by Gilbert (1982) provides a structured model for identifying issues before providing solutions. Swanson (1994) suggested the Performance Improvement/HPT model defines, frames, and directs the next phases of the model. Performance analysis has four steps: organizational analysis, environmental analysis, gap analysis, and cause analysis.
The second phase of the Performance Improvement/HPT model is intervention selection, design, and development. At the end of performance analysis, intervention selection begins (Binder, 2007; Rummler, 2007; Van Tiem, Moseley, and Dessinger (2004; 2012). Biech (2008), defined an intervention as “another name for a solution or set of solutions, usually a combination of tools and techniques that clearly and directly relate to solving a performance gap or implementing an organizational change” (p. 873). Van Tiem et al. (2012) defined an intervention as “a proposed solution to address workplace problems, opportunities, and challenges” (p. 195). Van Tiem et al. stated “it is impossible to identify a definitive list of interventions that would fit all circumstances” (p. 197). Consider the three steps when planning and identifying appropriate interventions.

The third phase of the Performance Improvement/HPT Model is implementation of the intervention. Van Tiem et al. (2012) suggested “comprehensive planning to introduce the intervention and minimize the resistance to change” (p. 197). Hale (2010) further suggested “strategic alignment of the intervention is paramount to the success of the intervention” (p. 44). Van Tiem et al. (2012) further pointed out in the model that maintenance or sustaining improvements is another process for consideration. Incorporating the intervention into the current work process requires a four steps: communication, action, auditing, and feedback (Van Tiem et al., 2012).

The fourth phase of the Performance Improvement/HPT model is evaluation. Several authors of evaluation can agree that the purpose of evaluation is to compare interventions with intended results. Kaufman, Keller, and Watkins (1997) defined evaluation “as a way to compare results with intentions and delve into the usefulness of methods and resources so that we may move toward the required results” (p. 206). From the definition, it is clear how the evaluation
phase of the Performance/Improvement/HPT model might be implemented. Van Tiem et al. (2012) pointed out “it is essential that change management be integrated with the entire improvement process” (pp. 72-73).

The Performance Improvement/HPT Model helped to frame the work of this study. Not meeting sales quota objectives can be described as a performance gap; not achieving desired output in hiring selection can be described as a performance gap also. This allowed the researcher to make the assumption of a causal chain that remained within the framework of the HPT model. A way to contribute to the closing of the gap in sales performance might be to close the performance gap in hiring selection outcome. Additionally, a way to contribute to the closing of the performance gap in hiring selection outcome might be to assess individual characteristics of salespersons during hiring selection. This assumption can be empirically tested with the same approach that already has been described above: one has to show that individual characteristics such as capacity and motives as a valid predictor of performance and that they explain a considerable part of the variation in individual human performance. If this is the case, the use of assessment tools that assess individual characteristics would not only improve hiring selection but also have leverage in engineering human performance.

The model also is a description of the performance improvement process. The process of performance improvement across a sales organization provides the appropriate lens to team with sales management and stakeholders to effectively and efficiently select, analyze, design, develop, implement, and evaluate programs that influence behavior. It is very clear this includes hiring selection approaches. If the results of this study should become a part of a practical and probably more comprehensive approach to improve sales performance, in total Van Tiem’s et al. (2012)
model could guide this effort. In this sense, the model points far beyond the more limited scope of this study.

**Psychometric Assessment Tool and Performance.** Some authors (Barrick and Mount, 1991) have suggested and demonstrated the use of psychometric assessment tools as predictors of job performance (Tett, Jackson, & Rothstein, 1991; Huffcutt, Conway, Roth, & Stone, 2001). The ProfileXT© psychometric assessment tool was selected for two reasons. First, this assessment tool incorporates the capacity and motives section of Gilbert’s (1978) Behavior Engineering Model. In other words, it assesses what Gilbert suggested to assess. Second, the ProfileXT© psychometric assessment tool has been extensively validated and reviewed by a panel of experts and can be found in the Mental Measurements Yearbook (Profile International, I., 2007).

Barrick and Mount (1991) have used a meta-analytic method to investigate personality dimensions specifically in sales. This particular study is of importance to note because it was the first research to investigate the relationship between personality and performance. Barrick and Mount’s (1991) meta-analytical review “is one of the most widely referenced research studies on this topic. As a part of this study, Barrick and Mount (1991) reviewed 117 studies with 162 different samples. The total sample size for this study was 23,994. Barrick and Mount (1991) referred to Schmidt and Hunter’s process to find correlations using corrected means among the variables. The findings indicated conscientiousness was the most consistent predictor of performance.

Although the ProfileXT© assesses what Gilbert suggested to assess, there is an important consideration. ProfileXT© uses ipsative data for the motivation part. Cattell (1943) and Guilford (1954) recognized challenges using ipsative data initially. These authors describe the
term ipsative as “a synonym for interdependent and referring to some type of dependency among the variables” (p. 373). An ipsative assessment uses forced choice questions and responses. It is important to understand normative versus ipsative when it comes to the discussion on utilizing assessment tools for hiring selection because ipsative assessments are not effective for hiring and selection instruments due to a measurement dependency problem (Hicks, 1970).

For maximum reliability, ipsative components of the ProfileXT© were not included in the study as predictors for performance. ANOVA using SPSS software on the motivation scales determined one scale had a significant difference: Technical. Technical was significant in this analysis, which means for the population of this research study, the scale “technical” would have been a predictor for performance, but in this case can only be done in hindsight, and technical was a negative correlation. See Chapter 4, Table 10 for a more detailed explanation. Because ipsative scales, due to their construction can be manipulated, manipulation of the results cannot be used in a hiring selection setting to predict performance.

**Practical Implications.** The study has practical implications for sales organizations. Lilford, Vigar-Ellis, and Nel (2014) suggested, “A definitive identification of the characteristics of the ideal salesperson remains elusive and sales literature offers a wide range of explanatory variables that contribute in the small albeit significant ways to salesperson performance”, it is helpful to understand this relationship better (p. 147). Sales organizations would benefit from understanding how individual characteristics impact performance and how those characteristics can be used to inform hiring selection decisions. In fact the results will be useful beyond hiring selection including professional development and succession planning. When evaluating candidates for sales positions, most companies use resumes and references as indicators of past performance. In addition, interviews along with these tools are common (Bernthal & Erker,
Fernandez-Aroaz (2001) suggested that resumes can be fabricated when highlighting past success. With the threats of litigation, references are limited (Howard, 2001). This shows limitations of current hiring selections. Schmidt and Hunter (1998) have reported assessment tools combined with interviews as a valuable addition to candidate hiring selection.

**Theoretical implications.** Law, Schmidt and Hunter (1994) suggested that theories of job performance that have been developed to test future job performance require more research to understand more specifically what measurable characteristics impact performance outcomes. From a theoretical viewpoint, the study examined whether there were predictors or different combinations of predictors that could be most practical to use for hiring in an industrial setting. The combination of multiple predictors would be informative to determine the best predictors of sales job performance in an industrial setting.

While there is a vast amount of literature regarding personnel measures for predicting future job performance, Law, Schmidt and Hunter (1994) suggested there was still a gap in the literature for predicting future job performance from a basic understanding of human competence. The theoretical value in the research findings was to identify the relationship between cognitive, behavior, and motivation characteristics and sales performance outcomes. The research study emphasized the relevancy of the individual factors and provided a framework for further explaining salesperson performance outcome based on cognitive, behavior, and motivation characteristics.

**Statement of the Problem**

Currently a gap exists between current and desired performance of salespersons in three industrial sales organizations in West Virginia. The decrease in sale quota attainment has raised attention to the gap and led to the assumption that the gap in sales performance is, to a large
extent, caused by individual characteristics of salespersons, and that better hiring selection could solve this problem. Human Performance Technology literature suggested that selection is considered a low leverage [low impact] to improve performance (Gilbert, 1978, p. 89). Further, there was not enough systematic research and appropriate results to explain to the industrial sales organizations the connection between individual characteristics and their respective sales performance (Hunter & Hunter, 1984; Hunter, Schmidt, & Judiesch, 1990). As a result, there was a need to determine if individual salesperson characteristics have impact on sales performance, which ones have the greatest impact and; therefore, should be considered when identifying and recruiting top-performing sales representatives. In case there are individual characteristics that allow for the prediction of sales performance and can be assessed during hiring selection, it would improve hiring selection performance and in turn drive sales performance.

**Purpose of the Study**

There is extensive research that has produced inconsistent results as to the relationship of personality variables and sales performance (Hunter and Hunter, 1984; Hunter, Schmidt, & Judiesch, 1990). Barrick and Mount (1991) conducted meta-analyses to assess the ability of personality to predict sales performance and found varying ranges from -.02 for experience to .51 for conscientiousness. Vinchur et al. (1998) more recently discovered conscientiousness as a strong predictor of sales performance. The findings further suggest motivation as a strong predictor of sales performance (Vinchur et al., 1998). Hunter and Hunter (1984) revealed correlations between salesperson performance and cognitive ability. While these findings contribute to the body of knowledge on sales and performance, consistent results regarding what are the most important individual characteristics in an industrial setting are lacking. The purpose
of this study was to examine further the link between individual characteristics and sales performance and to use the results to contribute to an improvement of salesperson hiring selection approaches. More precisely, this research study examined the relationship between individual cognitive, behavior, and motivation characteristics and sales performance outcomes based on percent to sales quota. The characteristics are cognitive, behavior, and motivation. Cognitive characteristics are divided into four factors (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Each of the factors has its own scale. In addition to these four scales, Cognitive has a fifth scale (learning index) that is a composite scale of the other four cognitive scales (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Behavior characteristics has nine factors (energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment) and no composite scale. Motivation characteristics has six factors (financial, people service, enterprising, creative, technical, and mechanical) and no composite scale. See Table 2. Because the study was focused on examining the relationship between individual characteristics (independent variables) and sales quota achievement (dependent variable), a quantitative, correlational study was appropriate. Creswell (2005) and Neuman (2003) suggested a quantitative, correlational study when exploring relationships between independent and dependent variables. Based on this quantitative approach, the research questions were addressed by determining if individual characteristics have predictive validity for sales performance, and what are the characteristics with the biggest impact. The data collected in this research study focused on the support or rejection of the null hypotheses.
Research Questions

Quantitative Research Questions and Hypotheses:

R1: Is there a relationship between individual cognitive characteristics and sales quota attainment?

H₀: There is no relationship between individual cognitive characteristics and sales quota attainment.

H₁: There is a relationship between individual cognitive characteristics and sales quota attainment.

R2: Is there a relationship between individual behavior characteristics and sales quota attainment?

H₀: There is no relationship between individual behavior characteristics and sales quota attainment.

H₁: There is a relationship between individual behavior characteristics and sales quota attainment.

R3: Is there a relationship between individual motivation characteristics and sales quota attainment?

H₀: There is no relationship between individual motivation characteristics and sales quota attainment.

H₁: There is a relationship between individual motivation characteristics and sales quota attainment.

To answer the three research questions, one has to check all the independent variables that contribute to cognitive, behavior, and motivation characteristics.
Rationale, Relevance, and Significance

According to Kaufman and Bernardez (2012), “A desired outcome of scientific research; however, is to use the theories and findings to in some way improve, promote, or better achieve desired human ends” (p. 14). In the case of this study, the desired ends were improved outcomes in recruiting and selecting sales representatives in an industrial setting in West Virginia that in turn is supposed to improve performance of salespersons. The research study further promoted the significance of a human performance improvement model within the recruiting and hiring selection process as a model for understanding hiring selection factors.

The research study provided an opportunity to focus and extend our understanding of the individual factors that facilitate sales performance and allows stakeholders to make better informed hiring selection decisions. Adequate attention has not been given in the context of understanding the use and effectiveness of utilizing assessment interventions for predicting sales performance in an industrial setting (Ferond, 2006). The changing nature of work, in particular the sales industry, has presented additional complex challenges to understanding assessment interventions for enhancing sales performance outcomes. The research study attempted to expand on this theory; utilizing the Performance Improvement/HPT Model helps to analyze the gap between current and desired performance. High-performing sales people today serve more as a consultant and partner (Anderson & Huang, 2006). As a result, continued research is needed to expand on our understanding of individual factors that contribute to sales performance in current scenarios (Vinchur et al., 1998). The research study attempted to diminish this gap and to contribute to the body of knowledge on the correlation between individual characteristics and sales performance.
Substantial research exists regarding organizational factors and performance (Guthrie, 2001; Liao & Chuang, 2004; Takeuchi, Lepak, Wang, & Takeuchi, 2007). There is limited research on individual factors in the context of sales performance in an industrial setting. Churchill et al. (1985) noted deficiencies in the literature regarding contemporary sales organizations. Kuster and Canales (2011) suggested “the achievement of acceptable sales results is an essential requirement of companies’ performance as well as a requirement which enables salespeople to achieve their individual objectives” (p. 275). In context with Churchill’s (1985) research, Kuster and Canales (2011) suggested “performance signifies a result of behavior which is evaluated in terms of its contributions to the company’s objectives and is determined based on outcomes” (p. 276). This research study represented an opportunity to lay the foundation for an ongoing and productive investigation of the relationships between cognitive, behavior, and motivation characteristics and sales performance in the contemporary organization. The research contributed to the field as follows:

First, despite ongoing research regarding our understanding of human performance, an appropriate understanding of how salesperson performance in an industrial setting depends on cognitive, behavior, and motivation characteristics has not been clearly established (Churchill, Ford, Hartley, & Walker, 1985). The research extended the literature and guide future research into individual factors that play a role in sales performance outcomes in an industrial setting. More specifically, the research study sought to highlight the relevance and extend the literature for identifying a top-performing salesperson in an industrial setting based on cognitive, behavior, and motivation characteristics as measured by sales percent to quota across three years.

Second, further evidence was provided from examining individual factors to extend the literature in human performance improvement. The present research study will do this by
linking the results as it relates to human performance improvement to individual capacity and motives thus providing more insight into the different aspects of capacity and motivation into their leverage concerning sales performance than currently can be found in the existing performance improvement models. The results of the research study add to the body of knowledge helping human performance improvement practitioners gain a deeper understanding of the characteristics that may impact sales performance when analyzing hiring practices to align practices with business strategy.

Lastly, human performance improvement practitioners and consultants not only work with clients from education, they also work with business and industry. The research results are a contribution to the development of the field of human performance improvement since it provides research in a business setting at the individual level. While Rummler and Brache (1995), Tosti and Jackson (1999), and Swanson and Holton (2005) have addressed business level performance, individual level performance research especially research that focuses on individual characteristics that influence performance are limited. Therefore, the study expanded on the theories in human performance improvement.

**Nature of the Study**

The quantitative method was appropriate for this research study because the effect of independent variables on a dependent variable was investigated (Creswell, 2008). In order to obtain statistical analyses of the findings, the data was collected and expressed in numbers (Neuman, 2005). Correlation is defined by Creswell (2008a) as “a statistical test to determine the tendency or pattern for two (or more) variables or two sets of data to vary consistently” (p. 38).
Creswell (2008a) further suggested a quantitative, correlational study as a statistically consistent research method that can be repeated and used to identify the relationship between variables. Marczyk, DeMatteo, & Festinger (2005) suggested a quantitative, correlational study because the variable and the environment cannot be controlled allowing for a consistent approach to identifying the extent of the relationships.

Creswell (2003) further suggested quantitative methods for explaining and predicting phenomena among variables. Balnaves and Caputi (2001) suggested a quantitative method produces data that is measureable and testable. In addition, the data collected for this study was objective. Since the findings are measureable and the data is presented from an objective viewpoint, the quantitative method is appropriate.

**Definition of Terms**

*Appendix F.* Appendix F includes all the tables which were referenced in this dissertation. In order to allow for quick reference, Appendix F has been added to include Tables 1–10. Appendix F begins on Page 168.

*Behavior Traits.* Tett, Jackson and Rothstein (1991) suggested, “Personality is a key factor in job performance” (p. 728). Behavior is the “psychological premise that observable behavior is a reflection of cognitive states” (p. 731). The behavior traits section of the ProfileXT© consists of nine scales: energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment. Scale descriptions are referenced in Appendix E.

*Cognitive Thinking.* Hunter and Hunter (1984) suggested “cognitive abilities are a key predictor of success in occupational pursuits” (p. 74). The thinking style section of the ProfileXT© investigates four sub-scales as measured by learning index. The four sub-scales in
the cognitive thinking section of the ProfileXT© include verbal skill, verbal reasoning, numerical ability, and numeric reasoning. The learning index is a fifth scale which results in the combination of the raw scores for each of the sub-scales by converting the sum to a STEN score. A STEN (Scale of Ten) score is a system for using a ten-point scale with a normal distribution. The midpoint on a STEN Scale is 5.5. STEN scores are used in psychometric assessments. Scale descriptions are referenced in Appendix E.

**Distortion Scale.** “Scores on the ProfileXT Distortion scale provide a method for determining an assessment-taker’s level of disclosure and the veracity of his or her overall scale scores. Analysis consists of reviewing individual item response rates for the entire populations to show that the majority of the subjects respond to an item in a specific way, thereby making the alternative response highly uncommon. If the assessment-takers’ responses on this scale are atypical, this unusual response style may be present throughout the assessment” (Profile, I., 2010, p. 10).

**Human performance technology.** Van Tiem, Moseley, and Dessinger (2001), described human performance technology as “the science and art of improving people, process, and performance” (p. 2). The International Society of Performance Improvement (ISPI) defines human performance technology and human performance improvement as “the process of selection, analysis, design, development, implementation, and evaluation of programs to most cost-effectively influence behavior” (ISPI, 2012, para. 1).

**Human performance technology model.** The International Society for Performance Improvement (2003) suggested that human performance technology provides a guide for “systematically identifying and removing barriers to individual and organizational performance” (p. 8).
**Ipsative assessments.** An assessment score using forced choice questions and responses. Ipsative assessments are not effective for hiring selection instruments. With ipsative assessments, Hicks (1970) suggested a measurement dependency problem. In addition, in hiring selection situations using personality profiling, the scales measure typically are not applicable to the current job and not powerful predictors of performance (Martin, Bowen, and Hunt, 2002). For maximum reliability, ipsative components of the ProfileXT© were not included in the present study. The motivation section was evaluated separately.

**Learning Index.** The learning index score in the thinking style section (cognitive) measures verbal skill, verbal reasoning, numerical ability, and numeric reasoning. The scores from these Four sub-scales are averaged and reported on a ten-point standardized scale. Scale descriptions are referenced in Appendix E.

**Motivation.** Holland’s (1985) person-environment typology theory suggested “one’s motivation for work can be associated with various interest categories” (p. 12). These sections of the ProfileXT© contains 86 activities in 43 paired sets. The six occupational themes are as follows: enterprising, financial/administrative, people service, technical, mechanical, and creative. Interest and motivation characteristics are used interchangeably. The interest section of the ProfileXT© is ipsative and therefore cannot be considered as an objective comparison to other individuals.

**Normative assessments.** An assessment that measures quantifiable attributes on individual scales and compares the scores against a particular population or a normed population.

**Participants in the sample.** Industrial sales representatives from West Virginia based organizations who have completed a ProfileXT© assessment between the years 2012-2014 and who have been employed by the participating organization for at least one year.
ProfileXT©. The ProfileXT© assessment is a psychometric assessment tool with a history of over 30 years. The assessment measures and investigate three areas: cognitive, behavior, and motivation characteristics. The assessment tool was designed to focus on job fit. Scale descriptions are referenced in Appendix E.

ProfileXT© sub-scales. The four sub-scales in the cognitive thinking section of the ProfileXT© include verbal skill, verbal reasoning, numerical ability, and numeric reasoning. The learning index is a fifth scale which results in the combination of the raw scores for each of the sub-scales by converting the sum to a STEN score. Scale descriptions are referenced in Appendix E.

Technical manual. The ProfileXT© manual (2014) is a technical user’s guide that highlights the ProfileXT theory, development and psychometric characteristics. The 8th edition of the technical manual includes recent studies on concurrent validity and equity. (Profiles, I., 2014). The present research study uses the word “technical” 48 times in this dissertation. When referring to the technical manual, it is capitalized as Technical Manual. When referring to technical as an ipsative scale in the motivation section, it is lowercase.

Web portal. The web portal is owned by the three participating organizations in this research study. The web portal is a database that houses the results of the ProfileXT© along with sales performance numbers and other reports generated from the completion of a ProfileXT© assessment. The participating organizations purchased the rights to a web portal and pay an annual renewal subscription fee to maintain the rights to store assessment results from potential candidates as well as current employees. The web portal software program allows the user to customize content and determine what information can be added or deleted to specific reports.
Assumptions, Limitations, and Delimitations

Assumptions

Leedy and Ormrod (2010) suggested, “Assumptions are so basic that, without them, the research problem itself could not exist” (p. 62). The underlying assumptions used for this study were as follows:

- Normal distribution and homogeneity of variance conditions were met. Gravetter and Wallnau (1988) define the process of converting raw scores to STEN scores as norming. An assumption of psychometrics is that all levels of human characteristics when measured in every member of a population will fall in a frequency distribution that approximates a normal distribution. As an example, the STEN scores will fall between 4 and 7 and will reflect a standard deviation unit of 1.

- The target population is representative of industrial sales representatives who completed a ProfileXT© assessment and have been employed by the participating organization for a minimum of one year.

Results of the study can be used by human resource professionals, hiring managers, performance improvement consultants, and corporate executives to improve the hiring selection process.

Limitations

With correlational research, it is difficult to ascertain whether the finding generalize across other populations. The study had a few limitations which needed to be considered when it comes to generalizations. The limitations were as follows:

- The sample for this research study was not designed to generalize across other individuals, situations, or organizations including sales organizations in the United
States. Therefore, generalizations might not be possible which limits the results of the study to a specific group.

- The study was limited to three industrial sales organizations with corporate offices in West Virginia. The population was limited to 238 industrial sales representatives. Again, this limits the possibilities of generalizations. Local specifics might influence the results and make generalizations not feasible.

- The scope of the study was to see if a prediction could be made between sales performance and psychometric assessment results. This limited the study to a small set of factors that influence performance.

The study focused upon psychometric assessment results compared to sales percent to quota for 2012-2014 with no investigation of gender, educational level, and other demographics. This opened the possibility that although a correlation was found, the correlation did not tell us anything about causes. As an example, educational level might be a third factor. Consequently, the study was the first step and most probably triggers further research. **Delimitations**

The purpose statement for this study was clearly defined. In order to stay focused on the research plan, the theoretical framework, the methodology, and research variables of interest, the researcher used delimitations to set the boundaries. The following delimitations were in the study.

Because hiring selection approaches in sales organizations are often highly subjective and do not take systematically into account how individual characteristics influence sales performance, there was a performance gap concerning hiring selection of sales representatives. To close this gap, the study delimited itself to individual characteristics that were assumed to
influence sales performance (Gilbert, 1978). Environmental issues were not considered because environmental factors come into play after hiring individuals.

There are many different way to measure sales performance. One delimitation of this study was to define sales performance as meeting sales quota goals. The reason is this definition allows for a clear quantitative study design for such a purpose.

Many psychometric tools measure

There are a large number of psychometric assessment tools. The study delimited itself to the ProfileXT© because it is a validated tool with a 30-year history and the target population was already available. Otherwise, the data collection period alone would have taken 3 years. Sales representatives who exceeded 200% to sales quota were removed from the study to ensure validity of the reported data sets. Furthermore, less than 1% of the subjects had sales quotas above 200%. From the sample, one showed 1800% to sales quota and the other showed 2350%. The two data sets were both questionable. If the datasets would have been included, the data would be skewed as to make any regression results meaningless. Although generalizations of the results would be interesting, the researcher delimited to not doing it.

Organization of the Remainder of the Study

The remainder of the study provides a review of the literature in Chapter 2. Chapter 3 provides an explanation of the sample, research questions and hypotheses, and outlines the data collection procedures and process. Chapter 4 focused on the data analysis. Chapter 5 discussed the conclusions based on the findings from the research and the relationship of the findings to the literature review. In addition, Chapter 5 provided recommendations for future research.
CHAPTER 2. LITERATURE REVIEW

Introduction to the Literature Review

The literature review was divided into five sections. The first section, introduction to the literature review, provides an overview of the chapter structure. The second section outlines the theoretical framework based on Performance Improvement Models. The third section reviews research literature on sales performance and methodological literature on psychometric instruments and quantitative methodology. The fourth section contains a critique of previous research. The last section is a summary of Chapter 2.

Theoretical Framework

Performance Improvement

changes to a system in such a way that the system is improved in terms of the achievements its values” (p. 16). These definitions make clear that Human Performance Technology aims at improving human organization results and, therefore, can provide a theoretical framework when it comes to closing a gap in organization performance.

With the growing emphasis on human capital and the role it plays in the success of the organization, human performance technology principles focus on the value human performance and behavior play in this success. Schultz (1981) and Becker (1993) suggest “it is people, with their ability to learn, who offer the greatest potential for organizational success” (p. 387). Nickols (1977) defines performance as “the outcomes of behavior” (p.14). Gilbert (1974) defines performance as “accomplishments that we value” (p. 13). Linking together performance with improvement, Robinson and Robinson (1995), Dean and Ripley (1997), Kaufman, Thiagarajan and Macgillis (1997) are some of the scholars who have focused their research on performance improvement. Defining performance improvement from the viewpoints of these authors suggested performance improvement as “increased productivity and greater effectiveness as well as efficiency from work groups” (Keeps & Stolovitch, 1999, p. 5).

As the purpose of this study was to improve the performance of the selection process for salespersons to secure favorable performance of these salespersons, Performance Improvement provided the theoretical basis for this study. A review of the literature regarding performance improvement showed that two models are a central reference and are cited in almost every publication: Gilbert’s (1978) Behavior Engineering Model and Van Tiem et al. (2012) Performance Improvement/HPT Model. The reason is as follows: If one wants to engineer human performance, one needs an understanding of all of the factors that influence human
performance. Gilbert (1978) published a model that provided a systematic overview over these factors and served as a frequent reference in literature.

**Gilbert’s Behavioral Engineering Model.** B. F. Skinner (1953) coined the term “operant behavior” (p. 61). O’Donohue and Ferguson (2001) suggested from Skinner’s work, “Behavior is best influenced by rewarding acts that most closely approach the desired behavior” (p. 6). Thomas Gilbert was a student of B. F. Skinner (M. Gilbert, personal communication, November 8, 2015). During his research in the 1960’s and 1970’s, Thomas Gilbert was interested in further understanding human behavior (M. Gilbert, personal communication, November 8, 2015). Thomas Gilbert (1978) suggested, “For any given accomplishment, deficiency in performance always has as its immediate cause a deficiency in behavior repertory (P), or in the environment that supports the repertory (E), or in both. But its immediate cause will be found in a deficiency of the management system (M)” (Gilbert, 1978, p. 76). The Behavior Engineering Model developed by Gilbert (1978) provides organizations a way to identify factors that contribute to improved performance. Presented in Gilbert’s book, *Human Competence: Engineering Worthy Performance* (Gilbert, 1978, p. 88), the Behavior Engineering Model provides a way to engineer and to troubleshoot performance for both the individual and the organization by looking at individual factors and environmental supports that either increase or decrease performance. See Figure 1.
Gilbert’s (1978) Behavior Engineering Model focuses on six key factors that are clustered in two groups: data, resources, incentives (grouped into Environmental Support), and knowledge, capacity, and motives (grouped into Person’s Behavior Repertory) (Gupta, Govindarajan, & Malhotra, 1999; Van Tiem, Moseley & Dessinger, 2001). While Gilbert’s Behavior Engineering Model (Gilbert, 1978) focuses on the environmental and individual factors, the part of the model that covers environmental support was not relevant for the present study. The present study was used to examine if individual characteristics are a leverage for performance and should be considered more than current human performance technology literature suggests, especially during selection (Gilbert, 1978).
Chevalier (2003) suggested Gilbert’s Behavior Engineering Model helps organizations identify barriers to individual and organizational performance. The model certainly can be interpreted in that way, but Gilbert first of all developed it to engineer human performance. Therefore, the purpose of the model first of all was to provide a systematic and comprehensive overview over the factors that influence performance. Missing factors then turn out to be barriers to performance in so far as Chevalier’s interpretation was a valid one although not a complete one.

Gilbert’s (1978) Behavior Engineering Model was developed to promote worthy performance (Gilbert, 1996). Gilbert (1996) described worthy performance as the distinction between behavior and accomplishment. Worthy performance is the achievement whereas behavior contributes as cost to the equation (Gilbert, 1996). Binder (2007) suggested, “Gilbert’s emphasis on behavior output in lieu of behavior itself is regarded as his most pivotal contribution” (p. 50). In the context of this study, worthy performance is the achievement of sales quota objectives (accomplishment) as opposed to only showing a specific desired sales behavior and not meeting the quota objectives.

Gilbert (1992) further provided a definition of human performance as “a powerful collection of theory and methods that enables systematic maximization of any organization’s performance” (p. xiv). This is in line with Van Tiem’s et al. (2001) human performance technology definition as “the systematic process of linking business goals and strategies with the work force responsible for achieving the goals” (p. 8). Sales quota are business goals, salespersons the workforce responsible for achieving the goals. Performance Improvement provides the systematic process, theory, methods, models, and tools of linking the two.
Gilbert (1978, p.89) considered individual characteristics that are assessed during hiring selection a low leverage [low impact] for performance improvement and might underestimate the importance of those characteristics for performance. The result of the study intended to examine if Gilbert’s (1978) assumption is correct or not.

**Performance Improvement/HPT Model.** The Performance Improvement/HPT Model (Van Tiem et al., 2012b; see Figure 2) provides a framework to identify performance gaps, analyze the causes for these gaps, develop solutions to close the gap, implement and maintain the solution, and evaluate their success. Figure 2 shows the six segments of the model: analysis, intervention selection, design and development, implementation and maintenance, and evaluation.

![Performance Improvement/HPT Model](http://www.ispi.org/images/HPT-Model/HPT-Model-2012.jpg)

Performance is a generic term and in any context has to be filled with a specific definition what specific performance is in question. Therefore, a model that describes the performance improvement approach has to be generic too; at the same time, this is one of the biggest strengths of the model. Its generic nature allows for its application in almost any context.

It is applicable to a sales context too and can guide any performance improvement effort in sales systematically. The model has a strong emphasis on analysis. This is in line with other scholars in the field. A number of other authors have defined the performance analysis phase of the Performance Improvement/HPT Model. Swanson (1994) suggested the performance analysis phase of the Performance Improvement/HPT Model “defines, frames, and directs the remaining phases” (p. 45). In this phase, the problem or challenge needing improvement is identified. Rossett (1999) suggested, “Without analysis, there is no human performance technology” (p. 139). Gilbert (1982) suggested “performance analysis provides a structured model of delineating problem before selecting solutions” (p. 150). The foundation is performance analysis (Elliot, 1996). An assessment of the organization’s vision is the first step in performance analysis and is referred to as organizational analysis (Rummler, 2007; Tosti & Jackson, 1999; Van Tiem, Moseley, Dessinger, 2012).

Gilbert, Harless, Mager, and Rummler (2007) laid the foundation for performance analysis principles. While the models allow for different classifications such as individual performance versus organizational performance, Tosti & Jackson (1999) with similarities to Rummler address performance at multiple levels: organization, process, and job/performer. While each author of the different performance models take different steps to identify gaps in performance, the models are moving toward the same end result. Gap analysis is the “difference

For the purpose of this study, the model suggests to define the problem to solve as a gap in performance. This would mean the study contributes to solving a gap in hiring selection performance. Because the study focuses on only a specific improvement intervention (psychometric assessment), it can only contribute to closing the performance gap.

The performance analysis section of the Performance Improvement/HPT Model includes four phases: organizational analysis, environmental analysis, gap analysis, and causes analysis. Because of the focus of this study not all four phases are necessary for this study. The study investigates only a small component of the Performance Improvement/HPT Model from the perspective how individual characteristics are related to performance. Still the study can be described in terms of the HPT model. This study focuses on two performance gaps (the gap in hiring selection performance and the gap in sales performance); it examines if individual characteristics of sales people are possible causes for the gap in sales performance and if so the study would contribute to closing the gap in hiring selection performance by suggesting the utilization of tools that can measure the individual characteristics that predict sales performance. The HPT model suggested analyzing possible causes for a performance gap whereas this study restricts itself to a small group of possible causes. Due to this restriction, organizational analysis and environmental analysis does not apply to this study. Gap analysis does not apply either because the gaps were already defined. Therefore, the study focuses on a limited form of cause analysis.
Review of Research Literature and Methodological Literature

This section is divided into three sub-sections: Sales Performance; Psychometric Instrumentation; and Quantitative Methodology.

Sales Performance

Shannahan, Bush, and Shannahan (2011) suggested, “The determinants of sales performance may be some of the most studied yet most elusive variables in the marketing literature” (p. 40). Verbeke, Dietz, and Verwaal (2011) suggested “after having reviewed the past few decades of sales performance research, the sales performance construct is becoming increasingly complex” (p. 425). Evans, McFarland, Dietz, and Jaramillo (2012) further suggested “research concerning the key dependent variable, sales performance, is in need of further advancement” (p. 102). The importance of research on sales performance is evident since it has been studied since the early 1900s.


suggested goal orientation as skill. Whether a goal is a learning goal or a performance goal, there needs to be an alignment and focus on generating sales volume.

Sales representative participants in this research study focus on selling a tangible product. It is an industrial selling environment. Behram and Perreault (1982) developed a model of industrial sales performance based on five aspects of performance: sales objectives, technical knowledge, providing information, controlling expenses, and sales presentations. The Behram and Perreault (1982) Model equated into Gilbert’s (1978) Behavioral Engineering Model. Behram and Perreault’s (1982) sales objectives appear in Gilbert’s data box. Technical knowledge goes into Gilbert’s Knowledge box, providing information, controlling expenses, and sales presentations convert to skills. It makes visible that the Behram and Perreault (1982) Model is less comprehensive than the Gilbert model. Behram and Perrault’s (1982) Model shows that Gilbert’s model was more generic. Gilbert’s model does not show the details of the Behram and Perreault model. This difference is understandable. Gilbert’s (1978) model has to be more generic because it has to be adaptable to many contexts and too many different specific performance definitions whereas the Behram and Perreault’s Model is already sales specific. Gilbert’s (1978) Model is not clear whether it explicitly covers skills but one could argue that there is a proximity to knowledge and assume it would find its place in the knowledge box too. Additionally, in an example given by M. Gilbert (personal communication, September 5, 2015) Gilbert suggested, “Tom Gilbert developed the Behavior Engineering Model, which he introduced in his book Human Competence. Later, he called the model Probe. We used it in all our work, knowledge and skills. Good Writing requires considerable knowledge and skills. Gilbert’s model is certainly comprehensive.” In fact, Chevalier (2003) updated Gilbert’s (1978) Behavior Engineering model to add skills in the knowledge section as they are complementary.
Such a high level comparison already shows that Gilbert’s (1978) model is more comprehensive than the one of Beharm and Perreault.

Based upon a literature review, it appears as if Campbell’s (1993) theory on performance also provides a more comprehensive evaluation of sales performance than Beharm and Perreault’s (1982) Model. Campbell (1990a; Campbell et al, 1993) suggested job performance could be placed into a model based on eight general factors: (1) job-specific task proficiency, (2) non-job-specific task proficiency, (3) written and oral communication, (4) demonstrating effort, (5) maintaining personal discipline, (6) facilitating peer and team performance, (7) supervision/leadership, and (8) management/administration. While these factors are found in most jobs, Campbell (1990a; Campbell et al., 1993, 1995) suggested all factors might not be relevant for all jobs. In general, there is overlap between Campbell’s Model and Gilbert’s Model. Job-specific and non-job-specific task proficiency as well as written and oral communication and facilitating peer and team performance can be considered skills and localized in Gilbert’s knowledge box using the same argument. Demonstrating effort and maintaining personal discipline are attributes that could be considered capacity. Gilbert’s model has a respective box also. Supervision/leadership and management/administration are aspects that are not covered by Gilbert’s model although he states that any gap in performance finally has its cause in a shortcoming of management (Gilbert, 1976).

Salespeople hold a unique position in the workforce. Bagozzi (1978) suggested the position is a “boundary position” (p. 10). In trying to satisfy both internal and external customers, there are many demands on a salesperson. The challenge of balancing these demands and measuring sales performance is generally recognized by visible sales figures which become the sole responsibility of the salesperson (Bagozzi, 1978). There are two major perspectives on the

**Sales Performance Models**

environmental, behavior, and organizational factors only explained “10% of sales performance” (p. 113). Verbeke, Deits, and Verwall (2011) further confirmed Szymanski and Churchill’s (1990) research revealing similar results. Verbeke, et al. (2011) further suggested, “The effects of organizational and environmental variables are inherently inconsistent in the direction of their influence on sales performance” (p. 412). This supported the hypothesis of this study that it might make sense to look for individual factors that explain sales performance.

**Weitz’s Contingency Perspective Model.** The Weitz (1978, 1979, 1981) Model of adaptive selling proposed a behavior-performance relationship with moderating influences. Weitz (1981) suggested sales performance was a direct result of the ability to control the sales interaction. Weitz, Sujan and Sujan (1986) defined adaptive selling behavior as “the altering of sales behaviors during a customer interaction or across customer interactions based on perceived information about the nature of the selling situation” (p. 175). The three stages to the adaptive selling process are inputs, processes, and response (Eckert, 2006). Eckert (2006) also suggested four categories of adaptation: information, solution, communication, and process. Weitz et al. (1986) suggested the hiring selection of salespeople as an organizational change opportunity which may influence specific sales situations and sales performance. Weitz et al. (1986) suggestion of selection as a way to influence sales performance supports the hypothesis of this study.

The influences included salesperson resources, the nature of the customer’s buying task, the customer-salesperson relationship as well as interactions (Weitz et al., 1986).
Campbell, McCloy, Oppler & Sager’s Eight-Factor Theory. The general structure of job performance has been described by Campbell, McCloy, Oppler, and Sager (1993) in the eight-factor theory. Campbell et al. (1993) describe the measurement of performance as misunderstood by research due to the limited control the individual has of variables and criteria of the environment. The measurement of performance was further complicated by changes in other dimensions such as time and situation (Hough & Oswald, 2001). Despite the evidence in the literature, Campbell et al. (1993) suggested correlations between eight dimensions: job-
specific task proficiency, non-job specific task proficiency, written and oral communication, demonstrating effort, maintaining personal discipline, facilitating peer and team performance, supervision, and management or administration. Campbell et al. (1993) further suggested early research did not account for uncertainty and interdependence when measuring behavior that contribute to effective performance. No reference to individual characteristics was made in the Eight-Factor Theory.

There is much to learn about individual sales performance from a review of the human performance improvement and sales performance literature. Three models of sales performance were presented and a close examination revealed theoretical gaps and study methodological limitations since the models appear to have different definitions for sales performance as well as a difference in the overall hierarchy of performance and how performance is classified. After a review of the aforementioned models in relationship to hiring selection, the literature review indicates there is no shared and well-researched understanding of the factors that influence sales performance. Given this position, the result of the present research study contributes to the body of knowledge concerning individual characteristics that influence sales performance.

**Psychometric Instrumentation**

Schmidt and Hunter (1998) define individuals who are hired or promoted who do not perform at the level of proficiency needed related to cognitive, behavior, and motivation characteristics as a “bad hire or mis-hire” (p. 271). The Institute for Research on Labor and Employment (2012) suggested replacing a bad hire as costing the organization 150% of the new employee’s salary for the first year. In 2004, Barada’s research reported these costs at being three times the annual salary. Schmidt and Hunter (1998) have validated the utilization of psychometric assessment for measuring job performance. Hough and Oswald (2000), described
psychometric assessment instruments as the most reliable and valid tools for practitioners available. Barrick and Mount (1991) suggested psychometric instruments for hiring selection, promotion, and developmental activities.

Schmidt and Hunter (1998) presented three valid points in their meta-analysis of 85 years of research in personnel selection. Schmidt and Hunter’s (1998) meta-analysis found the three important points to be as follows: a) the economic value of gains from improved hiring methods are quite large; b) these gains are directly proportional to the size of the increase in validity when moving from the old to the new hiring selection methods; and c) no other characteristics of a personnel measure is as important as predictive validity. The research of Schmidt and Hunter (1998) only examined certain predictor combinations. However, the general findings of their research suggested that research that could improve hiring methods would lead to economic gain; and therefore, this study has relevance for the body of knowledge concerning hiring methods as well as practitioners in the field who are looking for better hiring approaches.

**The psychometric instrument.** The emphasis on predicting job performance was found in an influential article by Schmidt and Hunter (1998) on the topic of instruments and the use for predicting performance outcomes. In their research, Schmidt and Hunter (1998) claimed, “great potential value in any procedure which would enable an employer to predict which job applicants will have high and which will have low productivity” (p. 293). As a psychometric instrument, the ProfileXT©; psychometric assessment was selected for use in this research study because the reliability and validity of the instrument was established and because it measures cognitive, behavior, and motivation characteristics of people—exactly what Gilbert (1976, p. 80) suggested to take into account when it comes to hiring selection. The instrument was reviewed by a panel
of experts and can be found in the Mental Measurements Yearbook (Profiles International, I., 2007).

Davis (1992), Grant and Davis (1998), Rubio, Berg-Weger, Tebb, Lee, and Rauch (2003) established the steps necessary for establishing content validity for a psychometric assessment tool. Following these steps, the ProfileXT© established the content validity analysis for the ProfileXT©. Appendix D references content validity for the domains of the ProfileXT© (PXT): cognitive, behavior, and motivation/interest. More detailed information can be found in the eighty-one page ProfileXT© Technical Manual (2014) which includes recent studies on concurrent validity, equity, and empirical evidence from the literature which establish the reliability and validity of this instrument. Appendix E references the ProfileXT© Quick Reference Guide which outlines the descriptions and further describes each of the scales in the ProfileXT© assessment including the cognitive, behavior, and motivation sections of the ProfileXT©. In attempting to determine whether a relationship exists between cognitive, behavior, and motivation characteristics and sales performance outcomes, the ProfileXT© instrument was utilized.

The ProfileXT© was designed to test three areas: cognitive, behavior, and motivation. The 8th edition of the technical manual for the ProfileXT© was completed in 2014. The ProfileXT© assessment utilizes proprietary software. The assessment results were shown on the individual report as a scale of ten (STEN) scores. The ProfileXT© is administered online and is not a timed assessment. Scale descriptions were also outlined in Appendix D and E.

Cognitive, Behavior, and Motivation Characteristics

Cognitive. Oschin (1918) is the earliest research on sales performance based on the “mental ability” of sales clerks. Cognitive ability has had mixed reviews in the ability to predict
sales performance (Schmidt & Hunter, 1981). Still, the relationship between sales performance and cognitive ability has been an indicator of sales performance depending on the performance outcome measurement (Vinchur, Schippmann, Switzer, & Roth, 1998). Schmidt and Hunter (1998) found cognitive ability as the most reliable predictor of job performance across occupations.

**Behavior.** George Gallup (1926) was one of the first researchers to study sales performance as it related to behavior. Gallup (1926) used a battery of tests to describe successful people and concluded it was behavior not cognitive ability or motivation that distinguished successful salespeople from unsuccessful salespeople. At this time, there was no psychometric assessment to measure traits (Gallup, 1926) nor was there a sound model for linking behavior to performance (Dodge, 1938; Hampton, 1941; Miner, 1962; Rodgers, 1959).

In the early 1990’s, interest in linking behavior to performance increased. Barrick and Mount (1991) suggested behavior as related to job performance. Barrick and Mount (1991) introduced the Big Five Factor Model from industrial psychology. In their study, Barrick and Mount (1991) found that the behavior traits could predict job performance. The behavior traits included: extraversion, emotional stability, agreeableness, conscientiousness, and open to experience. Various other studies included the Five-Factor Model as a reliable and valid predictor of job performance (Judge, 2001b; Rothmann & Coetzer, 2003; Salgado, 1997; Tett, Jackson & Rothstien, 1991; Vinchur, Schippmann, Sweizer & Roth, 1998).

More recently, Plouffe, Sridharan, and Barclay (2010) suggested “competitive salespeople are known to be proactive” (p. 546). Plouffe et al. (2010) further suggested “the relative presence or absence, of trait competitiveness drives some of the salesperson’s most basic behaviors” (p. 540). Shannahan, Bush, and Shannahan (2013), reinforce this research and
suggested “competitive individuals recognize that performance gains can be made through the mediation of work effort” (p. 44). “Those who are highly competitive constantly monitor their performance in relation to others to make sure they are surpassing their peers” (Shannahan, Bush, & Shannahan, p. 44).

Motivation. Though found unreliable, research began as early as 1925 to study the relationship between vocational interest and success in sales (Craig, 1925; Freyd, 1926). A more recent review of the literature suggested two models for classifying motivational interests: The previously described Five-Factor Model and Holland’s RIASEC theory (Holland, 1978, 1985, 1996). RIASEC stands for realistic, investigative, artistic, social, enterprising, and conventional. Holland’s (1978; 1985) RIASEC typology indicated a direct correlation between behavioral traits and interests. A review of Holland’s RIASEC theory (Holland, 1978, 1985, 1996) provided this useful classification to facilitate a discussion regarding personality and the relationship to vocational interests. Holland’s (1985) theory stated, “An employee’s satisfaction with a job, as well as propensity to leave that job, depend on the degree to which the individual’s personality matches his or her occupational environment” (Barrick, Mount, & Gupta, 2006, p. 46). A review of the literature indicated there are no peer-reviewed published studies that have reported correlational relationships between Holland’s (1985) RIASEC types and sales performance outcomes.

In addition to Holland’s RIASEC theory (Holland, 1978, 1985, 1996), the study of motivation has been investigated by other scholars (Cummings & Schwab, 1973; Spector (1996); and Peters and O’Connor (1980). Cummings and Schwab (1973) suggested individual factors such as ability and motivation had an impact on performance and regarded this as the only factors that played a role in performance. Spector (1996) included environmental factors as
being equally important to ability and motivation. Using Peters and O’Connor (1980) as the framework for defining the work environment, Spector (1996) included eight environmental aspects: information, tools, and equipment, materials and supplies, budgetary support, required services and help from others, task preparation in terms of knowledge, skill, ability, and other personal characteristics.

As there are no research results that indicate that Motivation is a predictive independent variables for sales performance, the study examined the relationship by conducting a quantitative review of the correlations not only between cognitive and behavior and sales performance outcomes but also between motivation characteristics and sales performance outcomes. The next section begins with a discussion regarding quantitative methodological literature and is followed by sections on (a) correlation; (b) regression analysis; and, (c) predictive validity.

**Introduction to Quantitative Methodological Literature**

**Introduction**

The purpose of this quantitative, correlational study was to examine the relationship between individual cognitive, behavior, and motivation characteristics and sales performance outcomes based on percent to sales quota. Creswell (2005) and Neuman (2003) suggested quantitative, correlational study when exploring relationships between independent and dependent variables.

“`In quantitative studies, one uses theory deductively and places it toward the beginning of the plan for a study. The objective is to test or verify theory. One thus begins the study advancing a theory, collects data to test it, and reflects on whether the theory was confirmed or disconfirmed by the results in the study. The theory becomes a framework for the entire...`
study, an organizing model for the research questions or hypotheses for the data collection procedure” (Creswell, 1994, pp.87-88).

**Quantitative Methodology**

The quantitative method was appropriate for this research study because the effect of the independent variable on the dependent variable was investigated (Creswell, 2008). In order to obtain statistical analyses of the findings, the data was collected and expressed in numbers (Neuman, 2005). Correlation is defined by Creswell (2008a) as “a statistical test to determine the tendency or pattern for two (or more) variables or two sets of data to vary consistently” (p. 12) Creswell (2008a) further suggested a quantitative, correlational study as a statistically consistent research method which can be repeated and used to identify the relationship between variables. Marczyk, DeMatteo, & Festinger (2005) suggested a quantitative, correlational study because the variable and the environment cannot be controlled allowing for a consistent approach to identifying the extent of the relationships.

Creswell (2003) further suggested quantitative methods for explaining and predicting phenomena among variables. Balnaves and Caputi (2001) suggested a quantitative method produces data that is measureable and testable. In addition, the data collected for this study was objective. Since the findings will be measureable and the data will be presented from an objective viewpoint, the quantitative method is appropriate.

**Correlation**

Research and design among behavior scientists has seen increasing sophistication in correlation analysis and multiple regression (Cohen & Cohen, 2003). Cohen and Cohen (2003) suggest multiple regression and correlation analysis can be employed “whenever a quantitative ‘dependent variable’ is to be studied in its relationship to one or more research factors of interest, where each research factor is a set made up of one or more ‘independent variables’” (p. 407).
Correlation analysis and regression analysis both relate to relationship among the variables. While this is a very broad statement, the nature of the research study was to examine whether or not the independent variable predicts the dependent variable. The appropriate statistical test in the research study was correlation.

Creswell (2005) indicates “A correlation is a statistical test to determine the tendency or pattern for two (or more) variables or two sets of data to vary consistently” (p. 325). For example, a correlational design provides the opportunity to test the hypotheses by explaining the relationship between learning index, verbal skill, verbal reasoning, numerical ability, numeric reasoning, energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment (independent variables) and sales percent to quota from the years 2012-2014 (dependent variable). Since the focus of the research study was to either accept or reject the null hypotheses, correlation answered the research question. The logical extension of correlation is to try to predict some dependent variable, such as performance” (Swanson & Holton, 2005, p. 41). In addition to only doing correlations, the researcher took the present study further by utilizing regression analysis which is further discussed in Chapter 4.

**Regression Analysis**

Regression analysis not only allows one to see whether there is a correlation between one independent and one dependent variable, it also allows one to see whether there are combinations of independent variables that correlate with the dependent variable. Therefore, regression analysis provides for a deeper understanding of the relations between independent and dependent variables than simple one to one correlations. The regression analysis followed the steps
outlined in the framework by Hinkle, Wiersma, and Jurs (2003) and further discussed in the research of Nathans, Oswald, and Nimon (2012).

In addition, stepwise regression was utilized in Statistical Package for the Social Science (SPSS) software add independent variables one at a time to identify and select the variables with the highest r value. Clawson (1974) suggested stepwise regression as a commonly used method for selecting variables in a regression analysis by selecting the best predictor of the dependent variable. Utilizing stepwise regression analysis enabled the researcher to find the most effective combination of variables and which combinations of variables are most predictive of sales performance without overstating statistical significance. The details are outlined in Chapter 4.

**Predictive Validity**

“Hypotheses about the ways in which a personal characteristic is associated with behaviors at work are typically examined in terms of ‘criterion-related validity’, expressed as the correlation between a predictor and a criterion” (Warr, 1999, p. 2). Tett, Jackson, and Rothstein (1991) concluded that “validity coefficients were greater when researchers indicated that they had a rationale for examining specific traits than when no rationale was present” (p. 732). While there are two types of criterion-related validity (predictive validity and concurrent validity), the research study focused on predictive validity. Cattin (1979) suggested predictive validity of a regression model cross validates correlation.

French and Rumbles (2009) defined hiring selection as “the process by which managers and others use specific instruments to choose from a pool of applications a person or persons more likely to succeed in the job given the management goals and legal requirements” (p. 141). Ekuma (2012) suggested, “The central concern of any selection method is to pick out the best candidates in order to maximize the utility and predictability of the process” (p. 116). Ekuma
(2012) further suggested, “It is important for the products of a selection process to exhibit high predictive value and usefulness considering the costs associated with the process and turnover” (p. 117). Overall, Ekuma (2012) suggested, “predictive validity helps to measure the utility and reliability of a selection process as a human resource strategy” (p. 117).

**Critique of Previous Research**

Since sales is more financially beneficial to the organization than most other positions, the research regarding predictability when hiring sales personnel has extreme value (Farrell & Hakstian, 2001). In 1982, Ingram and Bellenger (1982) critiqued the history of sales research suggesting “neglect” of research regarding sales. Since the field of performance is still in the infancy stage, the literature on the topic of sales performance and hiring is almost non-existent. After analyzing the work of Plouffe, Williams, and Wacher (2008), articles on the topic of sales and performance related to hiring selection of salespeople, found 60 journal articles out of more than 1200 discussed hiring selection of sales personnel. Zoltners, Sinha, and Lorimer (2008) found 8% of the journal articles related to hiring selection of sales personnel. More recently, Verbeke, Deits, and Verwall’s (2011) meta-analysis of 268 sales performance determinant studies conducted between 1982 and 2008 echoed the research of Churchill et al. (1985) which suggested “not one of the predictors themselves account for a great amount of variation in sales performance—less than 10% on average” (p. 113). Plouffe, Bolander, and Cote’s (2014) research used four objective performance measures in their recent research. Interestingly, the control variables used by Plouffe et al. (2014) were assessed by five items from Churchill, Ford, and Walker (1976) and Behrman and Perreault (1984). Lastly, McClaren (2013) suggested an absence of reviews and evaluations of the methods used in personal selling.
In addition to the books referenced, a research of articles was conducted. The first step included a search for articles published in academic and practitioner-oriented performance, sales, training, assessment, and business journals during the period 2010 to 2015. The initial list of journals included the Academy of Management Journal (AMJ), Academy of Management Review (AMR), Journal of Business and Psychology (JBS), Journal of Management (JOM), Journal of Management Studies (JMS), and Journal of the Academy of Marketing and Science (JAMS), and Journal of Personal Selling and Management (JPSM), and the International Journal of Selection and Assessment (IJSA). In addition, practitioner-oriented journals, namely, the Performance Improvement Express, Harvard Business Review (HBR), and MIT Sloan Management Review (MSM) were also added to the literature review research. A focus was on articles and papers which included the words, sales quota, personality, and assessment in the title of keywords.

An advanced search in ProQuest including all publications with search words, sales quota, personality, and Churchill returned 608 articles from January 2010 through November 2015. Delineating the results from 2010-2015 along with narrowing the results to peer reviewed and scholarly journals resulted in 41 articles including all ProQuest Databases. An analysis of these articles revealed that the majority of the articles would not be useful for the purpose of this dissertation because they did not look at sales performance utilizing psychometric instruments for measurement. Thirty-two of the articles still referenced Churchill (1985) as the most recent model. To be included in the literature review, the articles reviewed not only included the sales component and psychometric instruments that measure personality, it also referred to Human Performance Improvement, more specifically in an industrial setting focused on sales. As a result, the most current literature based on this review were included in this dissertation.
While it is evident in the above literature overview that multiple studies comparing the relationship between a wide range of factors that were supposed to influencing sales performance, results are not consistent. Due to the different models underlying the research, the results are difficult to compare, if a comparison is possible at all. Research is limited in industrial sales organizations. Especially, there is limited research on the predictors for identifying top-performing talent for sales.

Although Scott (2009) suggested, “one of the foremost domains of business research is accurate identification of high-performing employees . . . [to increase] the probability of ‘true positive’ and ‘true negative’ hiring decisions” (p. 138). Identifying top-performing talent to increase revenue continues to be a question organizations face. The challenge is the inability for sales managers to make positive hiring decisions. After a review of research on this, Ford et al. (1987) stated, “traditional independent variables used for sales person hiring selection showed remarkably low explanation for the variance in sales performance” (p. 264).

This is a costly approach. Pathak and Tripathi (2010) suggested recruiters charge 15% to 20% of a salesperson’s annual salary for the first year. Allen, Bryant, and Vardaman (2010) found that recruiting and training expenses equaled more than 100% of the annual salary of a salesperson. The return on investment for an organization therefore is highly dependent on sales representatives performing at an extremely high level from the onset (Randall & Randall, 2001). As a result, it is more important than ever to extend the research on salesperson hiring selection and organizational performance to determine the best candidates for the sales industry (Ingram, 2005).

Ford, Walker, Churchill, and Hartley (1987) further explained that hiring selection of sales personnel did not include criteria that accounted for variability and was not useful for
predicting sales person performance. Hunter (1998) suggested that “variability in individual post-hire job performance increases the need for predictors.” (p. 263). This study examined whether cognitive, behavior, and motivation characteristics can predict sales performance and in so far it as contributes to the field of knowledge concerning individual characteristics that predict sales performance as well as supports practitioners to design more appropriate hiring selection approaches.

Chapter 2 Summary

The literature review outlined the theoretical framework based on two performance improvement models: Gilbert’s (1978) Behavior Engineering Model and Van Tiem et al. (2012) Performance Improvement/HPT Model. In addition, reviews of the research literature on sales performance as well as methodological literature on psychometric instruments and quantitative methodology was discussed. Lastly, a critique of previous research suggests both models can be applied to the current research study to add value for providing a framework using a psychometric instrument to contribute to closing a performance gap in hiring selection. The applicability of the models in a sales context can guide any performance improvement effort in sales systematically.
CHAPTER 3. METHODOLOGY

Introduction to Chapter 3

Chapter 3 outlines and describes the process and procedure utilized to conduct this research study. For this quantitative study, the data already existed at the three participating West Virginia organizations. The purpose of the study was to examine the relationship between individual cognitive, behavior, and motivation characteristics and sales performance outcomes based on percent to sales quota.

The research study was divided into the following sections: (a) purpose of the study; (b) research questions and hypotheses; (c) research design; (d) target population; (e) instrumentation, samples methods, and procedures; (f) research tools; (g) data collection; (h) operationalization of variables; (i) limitations of the research design; (j) data analysis; and (k) expected findings.

Purpose of the Proposed Study

The purpose of this quantitative research study was to analyze the relationship between individual cognitive, behavior, and motivation characteristics and sales quota attainment for three industrial sales organizations in West Virginia. Since the focus of this study was to emphasize quantitative outcomes of sales quota attainment, it was critical to identify core reasons for the lack of attainment in sales quota with objective performance metrics.

There is extensive research that has produced inconsistent results as to the relationship of personality variables and sales performance (Hunter and Hunter, 1984; Hunter, Schmidt, &
Judiesch, 1990). Barrick and Mount (1991) conducted meta-analyses to assess the ability of personality to predict sales performance and found varying ranges from -.02 for experience to .51 for conscientiousness. Vinchur et al. (1998) more recently discovered conscientiousness as a strong predictor of sales performance. The findings further suggested motivation as a strong predictor of sales performance (Vinchur et al., 1998). Hunter and Hunter (1984) revealed correlations between salesperson performance and cognitive ability. While these findings contribute to the body of knowledge on sales and performance, consistent results regarding cognitive, behavior, and motivation characteristics in an industrial setting are lacking. The link between these characteristics and sales performance were examined in this quantitative study in an industrial setting in West Virginia.

The data collected in this research study focused on the support or rejection of the null hypotheses. This quantitative research study examined the relationship between individual cognitive, behavior, and motivation characteristics and sales performance outcomes based on percent to sales quota.

**Research Questions and Hypotheses**

**Quantitative research question 1.** Is there a relationship between individual cognitive characteristics and sales quota attainment?

H$_{0}$: There is no relationship between individual cognitive characteristics and sales quota attainment.

H$_{1}$: There is a relationship between individual cognitive characteristics and sales quota attainment.

**Quantitative research question 2.** Is there a relationship between individual behavior characteristics and sales quota attainment?
H₀: There is no relationship between individual behavior characteristics and sales quota attainment.

H₁: There is a relationship between individual behavior characteristics and sales quota attainment.

**Quantitative research question 3.** Is there a relationship between individual motivation characteristics and sales quota attainment?

H₀: There is no relationship between individual motivation characteristics and sales quota attainment.

H₁: There is a relationship between individual motivation characteristics and sales quota attainment.

To answer the three research questions, one has to check all the independent variables that contribute to cognitive, behavior, and motivation characteristics. See Table 2.

**Research Design**

Creswell (2009) suggested one major type and most common approach to quantitative research is a correlational study. Creswell (2009) further explained a correlational design as “the degree of association among two or more variables at one point in time” (p.343). As an example, Creswell (2009) defined variables as characteristics of an individual that vary throughout the organization. In addition, Creswell (2005) and Neuman (2003) suggested quantitative, correlational study when exploring relationship between independent and dependent variables. This study explored the relationship between independent variables and sales quota achievement as the dependent variable (See Table 2). Therefore, a correlational study was appropriate. See also Gay and Diehl (1992).
Preexisting quantitative data was used to investigate the research questions and hypotheses. The ProfileXT© report was utilized between the years 2012-2014 to collect cognitive, behavior, and motivation characteristic scores from more than 300 sales representatives. After elimination of skewed data sets, 238 data sets from 238 sales representatives were accepted and built the population of this study. The organization of the ProfileXT© includes three constructs, 13 scales, and 6 motivational preferences (Profiles International, I., 2007). See Table 2.

Utilizing pre-existing data, the research study determined if cognitive, behavior, and motivation characteristics (the three constructs of the ProfileXT©, that contain 13 scales, and 6 motivational preferences) (Profiles International, I., 2007) impact performance outcomes measured based on percent to sales quota at three industrial sales organizations in West Virginia. The ProfileXT© web-portal system collected both assessment data and performance data. Data existed within the client web portals in each participating organization. The researcher requested the data from the participating organizations with no individual identifiers. The participating organizations compiled the matched data and removed names and other identifiers when the data was returned to the researcher. Subjects were not identifiable through direct or indirect identifiers, codes, or other identifying data.

Data was collected and Statistical Package for the Social Sciences (SPSS) software was utilized to run descriptive statistics, correlation, and regression analyses to determine the relationship between the independent and dependent variables. The dependent variable was percent to sales quota from the years 2012-2014. Percent to sales quota was utilized as the performance outcome measurement to determine which variables could be used to predict sales performance. The independent variables were the scales of the ProfileXT©. See Table 2.
Effect size was important to determine whether an independent variable could be useful as a predictor of sales performance. In order to show not only a correlation but to identify variables which predict performance, a higher r value was defined as a cut that distinguishes correlations from correlations high enough to serve as predictors.

Stepwise regression was utilized in Statistical Package for the Social Science (SPSS) software to identify and select the variables with the highest r value. Clawson (1974) suggested stepwise regression as a commonly used method for selecting variables in a regression analysis to select the best predictor of the dependent variable. In addition, stepwise regression analysis was used to identify which combination of independent variables were most predictive of sales performance.

**Target Population, Sampling Method, and Related Procedures**

**Target Population**

The target population was sales representatives that met the following requirements:

- Sales representatives had been working for one of the three companies for at least one year between 2012-2014
- Sales representatives had completed the ProfileXT© during this time
- Sales representatives’ sales quota achievement during this time was available for at least one year

**Sampling Method**

The following steps were implemented to recruit, contact, screen, and obtain appropriate consent for this quantitative study. The research study did not involve human participants; therefore, a completed informed consent was not necessary. Permission was requested from three industrial sales organizations in West Virginia. The site permission form was necessary
because the data sets were not publically available. Written letters on the official letterhead of
the organization were signed by an authorized official within the organization and dated six
months within Institutional Review Board submission.

The researcher obtained adequate matched information and blind test data needing only
organizational approval. The researcher received the data with no identifiers. The confidentiality
agreement was necessary since research assistants at the site organizations handled and de-
identified the data (Appendix B). The templates were provided to the researcher and were
completed after the pre-data collection call was approved by the researcher’s committee and
were completed at the appropriate time.

Cohen’s (1988) power tables enabled the researcher to carry out the research with an
appropriate sample size. The researcher utilized an online sample calculator to determine the
sample size (Length, 2001 & 2003). According to Lenth (2003), a sample size of 300 was
suitable to guarantee sufficient power for statistical analysis. Roasoft Sample Size Calculator
was also used to verify the sample size. With a confidence level at 95%, and a margin of error at
.01% , the present sample needed to be 300 (Roasoft Sample Size Calculator, 2006). For this
study, the researcher eliminated any sales representatives with less than twelve months of
experience from the years 2012-2014 because representatives spend most of the beginning
months in a training environment. While the sample size for the quantitative research study was
proposed to be 300, the actual number of data sets that could be used for statistical analysis after
the data sets were cleaned was 238. Two hundred thirty-eight data sets met the requirement:
ProfileXT© assessment completers with sales percent to quota for at least one year from 2012-
2014.
Data collection utilized pre-existing data that existed within the organization in the client web-portals. As discussed in an Institutional Review Board consultation, there were no programmer or analyst needed. The ProfileXT© system collected both assessment data and performance data. Subjects were not identifiable through direct or indirect identifiers, codes, or other identifying data.

**Recruitment**

The research study did not require recruitment. The data was pre-existing at all three participating organizations. A sample strategy was used to collect data from pre-existing records for sales representatives who completed a ProfileXT© assessment between 2012 and 2014. Preexisting data records were requested from all three participating organizations. The final sample size included 238 data record sets.

**Instrumentation**

The main research tools which were used in this study were the ProfileXT© psychometric assessment tool, the power tables in *Statistical Power Analysis for the Behavioral Sciences* (Profiles, I., 2007; Cohen, 1988), and SPSS software. It was important to determine the required sample size, significance level, minimum desired effect size, and the desired power during the design and planning stage (Hill, 1990; Gall, Borg, and Gall, 2002).

The ProfileXT© is a psychometric instrument with a development history extending 30 years. The test battery investigates three areas: cognitive, behavior, and motivation. The three areas are composed of a variety of constructs reported on 20, ten-point standardized scales also known as STEN scales. Each scale represents a construct related to one of the three areas found in the ProfileXT© instrument.
The technical manual for the ProfileXT© psychometric assessment is eighty-one pages and includes the content validity, conceptual framework, norming samples for cognitive, behavior, and motivation characteristics as well as coefficient alpha reliability analysis. The psychometric instrument reliability and validity data from the ProfileXT© Technical Manual including cognitive, behavior, and motivation characteristics was attached as Appendix D. For more detail, see also Chapter 2 “The psychometric instrument”.

Data Collection

Upon receiving approval from Capella University’s Institutional Review Board (IRB) and Committee approval on June 19, 2015, the researcher collected quantitative data from pre-existing records. Data was collected and the Statistical Package for the Social Sciences (SPSS) software was used to run descriptive statistics, correlation and regression analyses to determine the strength and direction of the relationship between study variables. In addition, the researcher used the software to express a regression function which might predict sales performance. Individual cognitive, behavioral, and motivational characteristics were measured using the ProfileXT©. The characteristics or scales are outlined in Table 3. Motivation and interest results will be discussed; however, the scores are ipsative in nature and may not be used to predict performance. More specifically, Meade (2004) describes ipsative data as “mathematically speaking, data are ipsative if a given set of responses always sum to the same total” (p. 531). The fundamental understanding of ipsative scores is there is no theoretical attribute as with normative. Since identical scores may result as an individual orders particular areas of motivation, the measure is the same for everyone. As a result, the scores as a relationship and measure of performance would be distorted. It is clear to see ipsative scores can have serious implications for hiring selection decisions in a realistic setting.
Table 3

ProfileXT© Scales

<table>
<thead>
<tr>
<th>Cognitive</th>
<th>Behavior</th>
<th>Motivation/Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Index</td>
<td>Energy Level</td>
<td>Financial</td>
</tr>
<tr>
<td>Verbal Skill</td>
<td>Assertiveness</td>
<td>People Service</td>
</tr>
<tr>
<td>Verbal Reasoning</td>
<td>Sociability</td>
<td>Enterprising</td>
</tr>
<tr>
<td>Numerical Ability</td>
<td>Manageability</td>
<td>Creative</td>
</tr>
<tr>
<td>Numeric Reasoning</td>
<td>Attitude</td>
<td>Technical</td>
</tr>
<tr>
<td></td>
<td>Decisiveness</td>
<td>Mechanical</td>
</tr>
<tr>
<td></td>
<td>Accommodating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Independence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Objective Judgment</td>
<td></td>
</tr>
</tbody>
</table>

(Profile International, I., 2007)

Individual sales performance was measured by the percent of sales quota achieved by the subjects.

Data collection procedures overview:

1. Written permission received from three industrial sales organizations in West Virginia.
   a. Requests were submitted to Human Resource Executives and Chief Executive Officers where appropriate
   b. Participating organizations completed a site permission form
   c. Research assistants at the organizations were responsible for downloading the data from the client web-portal. Research assistants also signed a confidentiality agreement.

2. The researcher received data from participating organizations from their organization web portal via an excel spreadsheet.

3. The researcher conducted appropriate analyses of quantitative data utilizing Statistical Package for the Social Science (SPSS) software.
Operationalization of Variables

Dependent Variable

The dependent variable for the research study was measured by the percent to sales quota. Consistent with the literature on studies regarding sales representatives and performance percent to sales quota achieved is how an individual’s actual monthly sales compare to the sales quota for the sales territory (Engle & Barnes, 2000). The monthly sales comparison were calculated for the period 2012-2014. The timeframe for the study was 2012-2014. In this research study, a sales representative who met their quota would receive 100 where a sales representative who was under quota by 5 percent would receive a 95.

Independent Variables

The independent variables for the research study were defined by the ProfileXT© scores. The ProfileXT© is a psychometric instrument with a development history extending 30 years. The test battery investigates three areas: cognitive, behavior, and motivation. The three areas are composed of a variety of constructs reported on 20, ten-point standardized scales also known as STEN scales. Each scale represents a construct related to one of the three sections found in the ProfileXT© instrument.

Cognitive. The reliability coefficient alpha for cognitive thinking is .81. Test-retest reliability has been demonstrated across all scales for cognitive thinking. With respect to validity, the relationship between the thinking style section scores and job performance has been demonstrated with a sample of 3,250 individual in 52 studies examining 110 job titles in 15 industries. The results from these studies support the effectiveness of the thinking style section in predicting job performance. See Appendix D.
Behavior. The behavior traits section consists of nine behavioral traits scales and a distortion scale. Between 1992 and 2009, more than 600,000 applicants were administered the behavioral traits scales. Correlation coefficients ranged in the middle .40’s. With this same sample, the behavioral traits scales for coefficient alpha reliabilities averaged .79. The reliability analysis indicates the nine scales are reliable and produce consistent results. Test-retest reliability has also been demonstrated across the behavior traits section of the ProfileXT©. Based on the constructs being measured, the internal validity of the behavior section indicates consistency as well. See Appendix D.

Motivation. The motivation section contains 86 activities in 43 paired sets. This section measures six major occupational themes. The average coefficient alpha for the six scales is .77. Work performance is significantly related to the constructs measured in the Motivation section. See Appendix D.

Data Analysis Procedures

Quantitative Data Analysis

The objective of the data analysis was to test which variables or which combination of variables are predictive of sales performance. As outlined above, stepwise regression analysis is the most effective approach for this research study. Pearson r and r2 values were reported to show the direction and strength of the relationship as well as the variance in sales performance explained by each variable.

The first step in the data analysis procedure was to obtain descriptive statistics for each of the variables utilizing the Statistical Package for the Social Science (SPSS) software. ProfileXT© mean scores for each sales representative score were received from the participating organizations in a Microsoft Excel spreadsheet along with sales percent to quota for 2012-2014.
Descriptive Statistics

The analysis of data included fourteen independent variables and one dependent variable. The dependent variable was percent to sales quota from 2012-2014. The independent variables were learning index, verbal skills, verbal reasoning, numerical ability, numerical reasoning, energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment. The analysis was completed and generated descriptive statistics of the number of participants (N = 238), the mean, and standard deviation.

Hypotheses testing/significance level. The researcher used pre-existing data for the present study. Statistical analysis of the data was conducted to determine whether the null hypotheses should be accepted or rejected. A Pearson’s r correlation coefficient was used to test the hypotheses. Correlation analysis was completed to find the relationship between the independent variables and sales performance. In addition, an analysis of variance was conducted to create a way to test all three null hypotheses at the same time. The significance level was set at the 0.05 level, p = 0.05. Stepwise analysis allowed the researcher to investigate each variable against multiple variables and different combinations.

Limitations of the Research Design

There were several limitations in the research study.

- The sample for this research study was not designed to generalize across other individual, situations, or organizations including sales organizations in the United States.
- The study was limited to three industrial sales organizations with corporate offices in West Virginia, and the study combined all three organizations into one sample.
• The scope of the study was to see if a prediction between sales performance and psychometric assessment results could be made.

• The population was limited to 238 industrial sales representatives in the Appalachian region of West Virginia.

• The study focused upon psychometric assessment results compared to sales percent to quota for 2012-2014 with no investigation of organizational culture, supervisor rating, gender, hire date, educational level, and other demographics.

• Using sales percent to quota may not be the only method for measuring organizational performance.

• Additional studies would be recommended to examine and improve the amount of data available.

**Expected Findings**

The expected findings of the proposed research were significant correlations between the independent variables and the dependent variables. In addition, significant correlations between groups of independent variables the dependent variables were expected.

Hunter and Hunter (1998) suggested the ability of assessments to predict job performance is directly proportional to the predictive validity coefficient of the assessment method. In addition, Hunter, Schmidt, and Judiesch (1990) found the use of assessments with increased predictive validity led to substantial increases in performance outcomes when measured in percentage increases in output. With this in mind, this research study expands on the work of Hunter and Hunter (1998).

While the expectations is to find significant correlations between the independent and the dependent variable, the researcher established a margin of error for analysis at the .05 level, p
Pearson’s r correlation coefficient was used to determine the strength of the correlation. The range of correlation coefficients range in absolute value from 0 to 1.00. Biddle (2005) suggested a correlation coefficient of .30 or higher as useful.

Two types of errors need to be considered when testing a hypothesis (Neyman & Pearson, 1933). A Type I error, also known as the alpha rate or $\alpha$, occurs when the researcher rejects a null-hypothesis that is true. Type I errors can be referred to as a false-positive or false rejection (Neyman & Pearson, 1933). A Type II error, also known as the beta rate $\beta$, occurs when the researcher draws a conclusion regarding a variable that has importance unrecognized by the researcher as such. Type II error can be referred to as a false-negative or false acceptance (Neyman & Pearson, 1933). Type I errors typically occur in multiple regression models when the variables have too much random error as measured by standard error of the mean computations when doing descriptive statistics (Neyman & Pearson, 1933).

Because the study was looking for predictors of sales performance it examined moderately strong to strong correlations between independent and dependent variables. More specifically, this equated to bivariate correlation coefficients (r values) at or above 0.30 (Biddle, 2005). Cohen (1988) suggested effect size known as estimated $d$ for expressing differences between variables. Hedges and Olkin (1985) suggested effect size as interchangeable, and effect size of $d$ could be converted to a correlation coefficient. Hunter and Schmidt (1990) corrected effect size estimates and were to be commended for correcting the unreliability in the index of job performance.

In this research study, the effect size was divided by the square root of the reliability of the criterion measure as suggested by Burke and Day (1986). The results were used to determine which variables can be used to predict sales performance. In order for the findings of this
research study to be meaningful, it was important to consider statistical significance and effect size as they complement each other when making sound, quantitative research decisions (Fan, 2001).

**Ethical Issues**

**Researcher's Position Statement**

**Conflict of interest assessment.** The researcher is a former consultant of the three participating organizations. Ethical practices were of the utmost importance in this research study. The Institutional Review Board and the researcher’s committee understood there would not be a conflict of interest in this research study. There were no identifiers given to the researcher upon the delivery of the data from the participating organizations. Since there were no participants in this study, subjects were not identifiable through direct or indirect identifiers, codes, or other identifying data. The researcher received the data with no individual identifiers. The participating organizations compiled the matched data and removed names and other identifiers when the data was returned to the researcher.

**Position statement.** The researcher is an entrepreneur with over 14 years of experience in psychometric assessment tools for hiring, leadership development, and succession planning. The background of the researcher could have presented a bias if the study had not been a quantitative design. Based on the study design, there was not an opportunity to influence or interpret the data eliminating bias and opinions in this study.

**Ethical Issues in the Study**

As previously discussed, the research study used pre-existing data. As a result, the research study provided a framework which ensured data protection and ethical aspects of data protection were addressed.
Chapter 3 Summary

The focus of Chapter 3 was the methodology of the research study. To discuss this, chapter 3 included: (a) purpose of the study; (b) research questions and hypotheses; (c) research design; (d) target population; (e) instrumentation, samples methods, and procedures; (f) research tools; (g) data collection; (h) operationalization of variables; (i) limitations of the research design; (j) data analysis; and (k) expected findings. In addition, ethical issues were discussed. Chapter 4 discusses the data analysis and results of the research study.
CHAPTER 4. DATA ANALYSIS AND RESULTS

Introduction

The purpose of the present research study was to investigate the relationship between cognitive, behavior, and motivation characteristics and sales job performance. In the context of this study, can job performance of salespersons (measured as sales quota attainment) of 238 sales representatives of three industrial sales organization in West Virginia be predicted by assessing cognitive, behavior, and motivation characteristics utilizing the ProfileXT© psychometric assessment tool. The tool consists of different scales that are designed to measure different factors that add up to the three characteristics: cognitive, behavior, and motivation. Cognitive characteristics are divided into four factors (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Each of the factors has its own scale. In addition to these four scales, Cognitive has a fifth scale (learning index) that is a composite scale of the four cognitive sub-scales (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Behavior characteristics has nine factors (energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment) and no composite scale. Motivation characteristics have six factors (financial, people service, enterprising, creative, technical, and mechanical) and no composite scale. See Table 1.

The data analysis for this research study included a sample of 238 industrial sales representatives in three sales organizations with corporate offices in West Virginia. Due to
missing measures of job performance and completed assessment results, the original sample of 300 data sets were finalized to 238 data record sets. The sample for each participating organization were combined for the analysis.

**Description of the Sample**

The quantitative sample included ProfileXT© results and percent to sales quotas from 2012-2014 for 238 industrial sales representatives in three West Virginia organizations. In order to test the research hypotheses and to get a single measure of sales performance over time, the percent to sales quotas (dependent variable) for each sales representative were calculated for the time period 2012-2014. The independent variables were: learning index, verbal skill, verbal reasoning, numerical ability, numeric reasoning, energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment. See Table 2. Both data sets were utilized in the analysis.

The quantitative sample data sets received from the three participating organizations were compiled into one sample. A total of 238 sales representatives were included in the sample for the period 2012-2014. (n=238).

**Quantitative Sample Description**

Percent to sales quota was calculated and included sales representatives who had been on the job at least six months. The analysis began with descriptive statistics on the dependent variable shown in Table 4.
As shown in Table 4, there was a difference in the sample size. Table 4 shows different size samples for each year because sales quotas and ProfileXT© scores combined were not available for the entire sample of 238.

Table 5 below indicates that scores are normally distributed. There were no scale scores that were skewed; therefore, the data is appropriate for the correlational analysis. The mean and standard deviation scores proved the scores were normally distributed across the population. See Table 5 below.

Table 5

Descriptive Statistics for Independent Variables (n=238)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Index</td>
<td>238</td>
<td>5.70</td>
<td>1.79</td>
</tr>
<tr>
<td>Verbal Skill</td>
<td>238</td>
<td>6.01</td>
<td>2.26</td>
</tr>
<tr>
<td>Verbal Reasoning</td>
<td>238</td>
<td>5.13</td>
<td>1.85</td>
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<tr>
<td>Numerical Ability</td>
<td>238</td>
<td>5.94</td>
<td>2.00</td>
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<tr>
<td>Numeric Reasoning</td>
<td>238</td>
<td>5.57</td>
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<tr>
<td>Energy Level</td>
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<td>5.49</td>
<td>1.76</td>
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<tr>
<td>Assertiveness</td>
<td>238</td>
<td>5.62</td>
<td>1.59</td>
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<tr>
<td>Sociability</td>
<td>238</td>
<td>6.88</td>
<td>2.23</td>
</tr>
</tbody>
</table>
Table 5 above outlines the means and standard deviations for the dependent as well as the independent variables. As indicated by Table 4 and Table 5, the mean and standard deviation includes both the independent and dependent variables no significant deviation from the distribution norm (.05 level of significance). Thus, the analysis showed evidence of the distribution norm. These results confirmed the validity of the sample since the scores were normally distributed conforming to statistical procedure to test hypotheses.

Given the data, the changes of Type 1 errors were greatly reduced simply due to the quality of the data. Two types of errors can be made when testing the hypothesis: Type I error and Type II errors. A Type I error is when a true null hypothesis can be incorrectly rejected which means the null hypothesis is actually true but rejected. In the present study, a Type I error would be if the researcher made the mistake of assuming there is a relationship between the variables when there is not a relationship. In order to claim statistical significance, the type 1 error has to be less than .05 and this is the case in the present study. In addition, Type I errors were further reduced in the present study by the fact that the sample of salespeople was distributed across a number of sales organizations in the region because the researcher wanted to get a representative sample because it constitutes a representative sales people in the region.

Type II error is occurs when a false null hypothesis can fail to be rejected which in the present study means there was no functional relationship between the variables if there really
was. Cohen (1992) suggested, “Maximum acceptable probability of a Type II error should be .2 (20%).” See Figure 6 below for possibilities regarding Type I and Type II error.

Summarizing the results can state that the sample followed a normal distribution and that there was no indication that the sample would induce Type 1 errors. The sample was therefore valid for the purpose of this study.

**Analysis.** As shown in Table 6, the ProfileXT© Cognitive and Behavior Characteristics scales emphasize correlations among the variables. These results indicated validity with respect to the relationship between the dependent and independent variables. As an example, the correlation between sales percent to quota and energy level was .161 and was significant as one might think for a salesperson. This indicates the scores were related but not as a predictor of performance on the job. The highest correlation was the Independence scale. The multiple correlation coefficient was .268 for the Independence Scale as shown in Table 6. While several of the other scales appear related, it was understood when the ProfileXT© was developed that the scales and an individual’s personality in general do correlate.
### Table 6

**Correlations of Sales Percent to Quota and ProfileXT© Cognitive & Behavior Characteristics**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>12</th>
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<tbody>
<tr>
<td>Avg_Pcnt (1)</td>
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<td></td>
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<td></td>
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<td>Learning Index (2)</td>
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<td></td>
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<td>Verbal Skill (3)</td>
<td>-.041</td>
<td>.732**</td>
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<td>Verbal Reasoning (4)</td>
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<td>.488**</td>
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</tr>
<tr>
<td>Numerical Ability (5)</td>
<td>.075</td>
<td>.738**</td>
<td>.425**</td>
<td>.480**</td>
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<tr>
<td>Numeric Reasoning (6)</td>
<td>.038</td>
<td>.732**</td>
<td>.364**</td>
<td>.527**</td>
<td>.489**</td>
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<tr>
<td>Energy Level (7)</td>
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<td>.040</td>
<td>.077</td>
<td>.095</td>
<td>-.010</td>
<td>-.029</td>
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<tr>
<td>Assertiveness (8)</td>
<td>.065</td>
<td>.019</td>
<td>.118</td>
<td>.055</td>
<td>.020</td>
<td>-.039</td>
<td>.319**</td>
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<td>Sociability (9)</td>
<td>-.008</td>
<td>.071</td>
<td>.108</td>
<td>.097</td>
<td>.043</td>
<td>-.076</td>
<td>.085</td>
<td>.315**</td>
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<tr>
<td>Manageability (10)</td>
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<td>.210**</td>
<td>.267**</td>
<td>.200**</td>
<td>.171**</td>
<td>.066</td>
<td>.245**</td>
<td>.051</td>
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<tr>
<td>Attitude (11)</td>
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<td>.288**</td>
<td>.127</td>
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<td>.002</td>
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<td>-.067</td>
<td>.302**</td>
<td>.676**</td>
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<tr>
<td>Decisiveness (12)</td>
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<td>.160*</td>
<td>.076</td>
<td>.018</td>
<td>-.098</td>
<td>.709**</td>
<td>.663**</td>
<td>.320**</td>
<td>-.066</td>
<td>-.069</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodating (13)</td>
<td>-.019</td>
<td>.130*</td>
<td>.137*</td>
<td>.179**</td>
<td>.135*</td>
<td>.027</td>
<td>.288**</td>
<td>.349**</td>
<td>.084</td>
<td>.576**</td>
<td>.378**</td>
<td>.336**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independence (14)</td>
<td>.268**</td>
<td>.052</td>
<td>-.057</td>
<td>-.060</td>
<td>.015</td>
<td>.053</td>
<td>.293**</td>
<td>-.112</td>
<td>.279**</td>
<td>.550**</td>
<td>.304**</td>
<td>.081</td>
<td>.391**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Objective Judgment (15)</td>
<td>-.053</td>
<td>.181**</td>
<td>.131*</td>
<td>.207**</td>
<td>.133*</td>
<td>.116</td>
<td>.300**</td>
<td>-.073</td>
<td>.208**</td>
<td>.552**</td>
<td>.292**</td>
<td>.208**</td>
<td>.419**</td>
<td>.255**</td>
<td>1</td>
</tr>
</tbody>
</table>

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

**Correlation is significant at the 0.01 level (2-tailed).
It is important to note the ProfileXT© measures personality on nine dimensions. According to the ProfileXT© 2007 Technical Manual, one-fourth of the correlations between these dimensions are less than .20. One-half of the correlations are below .30. It is determined from this, the nine dimensions have unique variations; however, there are a few exceptions (Profiles, 2007). Energy level and decisiveness were correlated at .805 and rank at the highest level of correlation among the dimensions. While there are correlations among the dimensions, the degree of the relationships indicates, the dimensions are unique and separate concepts (Profile, 2007).

With regression analysis in this research study, the researcher was trying to predict if any particular scale or combination of scales could be a prediction for sales performance in the sample. The assumption in regression that all variables used as predictors should be orthogonal or statistically unrelated. While it is impossible to categorize personality traits into a simple framework, it was understood variations are complex and so are individuals. The results of the study showed a close relationship among the independent variables which is by the design of the ProfileXT©. The inter-scale correlations and degree of relationship between two scales supports what we know about people and personality in general. The assumption of regression analysis is that the predictors are independent of each other. Correlation shows they are related.

As an example, it makes sense that decisiveness and energy would be interconnected in an individual who is driven and spontaneous and who acts on impulse. The natural relationship of these traits is supported in the design as some items are correlated on both scales (Profiles, 2007). Another example is the combination of assertiveness and decisiveness as discussed in the ProfileXT© Technical Manual where it is explained as follows:
The Assertiveness and Decisiveness traits are related to a person’s level of self-confidence. High scores on the Assertiveness scale reflect a willingness to defend one’s position and to remain steadfast in the stance one takes. High scores on the Decisiveness scale reflect a tendency to act with confidence and to see mistakes as merely a by-product of a willingness to take risk and make choices when it is necessary. The degree of the relationship between these two scales supports the view that decisive people express their positions with confidence. Similarly, people who are not firm in defending their actions are included to be irresolute and are uncomfortable being put into the role of decision maker. Those individuals whose scores on Assertiveness and Decisiveness are inversely related tend to demonstrate their stronger trait while being modulated by the other. Higher assertive individuals with low Decisiveness scores may not take action quickly, instead preferring to be influential and are overly status conscious. Highly decisive individuals with low Assertiveness scores may not be perceived as strong and convincing leaders but can act impetuously even when the situation calls for a more prudent approach. (p. 3-12).

Table 6 shows the strength of the correlations between sales percent to quota (dependent variable) and the independent variables listed. The strongest correlation between the dependent variable and independent variable was Independence. Energy was left out of the analysis as a predictor because the regression indicated energy level did not add to independence. Regression analysis showed that all of the other variables did not add to independence.

**Detailed Analysis**

A stepwise multiple regression was conducted to evaluate which ProfileXT© scale scores were most effective at predicting sales performance. At step 1 of the analysis, Independence was entered into the regression equation and was significantly related to sales performance, F (1,236) = 18.286, p < .001. The multiple correlation coefficient was .268, indicating approximately 7.18% of the variance in sales performance could be accounted for by independence alone. See Table 7.
Table 7

Regression Model Coefficients Independence Scale

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>60.581</td>
<td>7.826</td>
<td>7.741</td>
<td>.000</td>
</tr>
<tr>
<td>Independence</td>
<td>6.331</td>
<td>1.480</td>
<td>.268</td>
<td>4.276</td>
</tr>
</tbody>
</table>

Dependent Variable: Three-year % of Sales Quota Achieved

Thus the regression equation for predicting sales performance was:

Predicted Sales Performance = (6.33 x Independence) + 60.58

Table 8

Beta coefficient and significant level for regression equation using Stepwise

<table>
<thead>
<tr>
<th>Model</th>
<th>Beta In</th>
<th>Sig.</th>
<th>Partial Correlation</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Index</td>
<td>.008b</td>
<td>.899</td>
<td>.008</td>
<td>.997</td>
</tr>
<tr>
<td>Verbal Skill</td>
<td>-.026b</td>
<td>.681</td>
<td>-.027</td>
<td>.997</td>
</tr>
<tr>
<td>Verbal Reasoning</td>
<td>-.050b</td>
<td>.431</td>
<td>-.051</td>
<td>.996</td>
</tr>
<tr>
<td>Numerical Ability</td>
<td>.071b</td>
<td>.260</td>
<td>.073</td>
<td>1.000</td>
</tr>
<tr>
<td>Numeric Reasoning</td>
<td>.024b</td>
<td>.702</td>
<td>.025</td>
<td>.997</td>
</tr>
<tr>
<td>Energy Level</td>
<td>.090b</td>
<td>.171</td>
<td>.089</td>
<td>.914</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>.096b</td>
<td>.127</td>
<td>.099</td>
<td>.988</td>
</tr>
<tr>
<td>Sociability</td>
<td>.073b</td>
<td>.267</td>
<td>.072</td>
<td>.922</td>
</tr>
<tr>
<td>Manageability</td>
<td>.077b</td>
<td>.308</td>
<td>.066</td>
<td>.698</td>
</tr>
<tr>
<td>Attitude</td>
<td>.040b</td>
<td>.547</td>
<td>.039</td>
<td>.907</td>
</tr>
<tr>
<td>Decisiveness</td>
<td>.066b</td>
<td>.292</td>
<td>.069</td>
<td>.993</td>
</tr>
<tr>
<td>Accommodating</td>
<td>.101b</td>
<td>.139</td>
<td>.096</td>
<td>.847</td>
</tr>
<tr>
<td>Objective Judgment</td>
<td>.016b</td>
<td>.800</td>
<td>.017</td>
<td>.935</td>
</tr>
</tbody>
</table>
The final model produced from the stepwise regression analysis was presented in Table 8. The other PXT scales were not entered in the regression equation. The results for these variables are shown in Table 8.

**Summary of Quantitative Results**

The purpose of the study was to determine which scales from the ProfileXT© would predict sales performance as measured by the average percent to sales quota. Research Question 1 and 2 are based on normative scales predicting performance. Research Question 3 scales were ipsative, and therefore, could not predict performance. Investigation of the hypotheses below helped to further understand both the nature and the relationship between each scale and sales performance score. The results of the correlations were summarized in Table 4. The fifteen columns in the table indicate the significance of the correlation. The total sample size was 238 representatives. The sample was representative across the three organizations so the decision to include all results into one sample were made.

Null Hypothesis (H₀) for Research Question 1. There is no relationship between individual cognitive characteristics and sales quota attainment. Cognitive characteristics include: verbal skill, verbal reasoning, numerical ability, and numerical reasoning. Each of the factors has its own scale. In addition to these four scales, Cognitive has a fifth scale (Learning Index) that is a composite scale of the four cognitive sub-scales: verbal skill, verbal reasoning, numerical ability, and numerical reasoning). As a result of the analysis, there was no significant correlation in the relationship between individual cognitive characteristics and sales quota attainment. Neither on a composite scale level nor on a sub-scale level. The null hypothesis was not rejected.
Null Hypothesis (H₀) for Research Question 2. There is no relationship between individual behavior characteristics and sales quota attainment. Behavior characteristics is divided into 9 sub-scales: energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment. The correlations between all sub-scales and the dependent variable were examined. A positive statistically significant relationship were found between sales percent to quota and one independent variable. Independence was shown to be a statistically significant predictor of sales job performance in this sample; therefore, the null hypothesis was rejected. Although most of the behavior characteristics were not significantly correlated to the dependent variable, a statistically significant correlation between one behavior characteristic and the independent variable was enough to reject the null hypothesis because the null hypothesis excluded any correlation.

Null Hypothesis (H₀) for Research Question 3. There was no relationship between individual motivation characteristics and sales quota attainment. An ANOVA of the motivation scales indicated that one motivation scale was significant. As a result, if a sales person is interested in technical, the sales performance tends to go down. Therefore, the result suggests that the null hypothesis should be rejected for research question 3. A significant correlation between one of the motivation characteristics and the dependent variable would be sufficient to reject the null hypothesis. The result was questionable because the scale is ipsative and could be manipulated. Therefore, it was not possible to decide whether the null hypothesis could be rejected or not. Both cases remain possibilities. Further research with normative scales is needed to make a decision on the null hypothesis for research question 3.
Table 9

*Distribution of Top Motivational Characteristics*

<table>
<thead>
<tr>
<th>Selected Motivation</th>
<th>N = 230</th>
<th>Count</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td></td>
<td>195</td>
<td>84.8%</td>
</tr>
<tr>
<td>Technical</td>
<td></td>
<td>64</td>
<td>27.8%</td>
</tr>
<tr>
<td>People Service</td>
<td></td>
<td>127</td>
<td>55.2%</td>
</tr>
<tr>
<td>Creative</td>
<td></td>
<td>42</td>
<td>18.3%</td>
</tr>
<tr>
<td>Financial</td>
<td></td>
<td>97</td>
<td>42.2%</td>
</tr>
<tr>
<td>Enterprising</td>
<td></td>
<td>166</td>
<td>72.2%</td>
</tr>
</tbody>
</table>

The analysis of variance indicated a significant difference in mean percent sales quota achieved between those who selected Technical as their area of interest and those who did not. Since those not selecting Technical as a motivation area showed a higher percent to quota than those who did select it, there was a negative correlation between sales performance and the actual scale score for the Technical motivation category.

There was a caveat coming with this result. As mentioned earlier, motivation characteristics are ipsative. Motivation characteristics were focused on the individual performers’ interests and preferences. Manipulation of ipsative characteristics are not suitable to be used as a predictive value in hiring selection. See Table 9 and 10.
Table 10

*ANOVA of Percent Sales Quota Achieved by Motivation Domain Selected*

<table>
<thead>
<tr>
<th>Motivation</th>
<th>N</th>
<th>Mean of 3-year % of Sales Quota</th>
<th>Standard Deviation</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>35</td>
<td>96.69</td>
<td>50.42</td>
<td>.975</td>
<td>.324</td>
</tr>
<tr>
<td>Selected</td>
<td>195</td>
<td>105.10</td>
<td>45.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>166</td>
<td>110.41</td>
<td>46.14</td>
<td>12.63</td>
<td>.000</td>
</tr>
<tr>
<td>Selected</td>
<td>64</td>
<td>86.74</td>
<td>42.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>103</td>
<td>102.26</td>
<td>46.22</td>
<td>.210</td>
<td>.647</td>
</tr>
<tr>
<td>Selected</td>
<td>127</td>
<td>105.08</td>
<td>46.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>188</td>
<td>101.16</td>
<td>44.75</td>
<td>3.44</td>
<td>.065</td>
</tr>
<tr>
<td>Selected</td>
<td>42</td>
<td>115.76</td>
<td>52.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>133</td>
<td>106.02</td>
<td>42.32</td>
<td>.710</td>
<td>.400</td>
</tr>
<tr>
<td>Selected</td>
<td>97</td>
<td>100.80</td>
<td>51.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterprising</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>64</td>
<td>98.26</td>
<td>54.61</td>
<td>1.277</td>
<td>.260</td>
</tr>
<tr>
<td>Selected</td>
<td>166</td>
<td>105.97</td>
<td>42.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Correlational design measured the degree of the relationship between the variables, and Figure 5 presents a scatterplot diagram showing the relationship between two variables: three-year percent to sales quota met and the ProfileXT© Independence score. It is an informative way to show the relationship between the two variables. Robson (2002) suggested scatterplots as “a powerful pictorial device, giving a clear picture of the nature and strength of the relationship between the variables” (p. 420).
A linear regression line were added to Figure 5 to further illustrate the relationship between the dependent and independent variable. The slope of the line indicates as the independence score increases the sales percent to quota also increases substantially among the sample. ANOVA allowed for the measurement of significant relationships among the variables and was important to the researcher for either rejecting or accepting the null hypotheses. Independence stands alone as the most notable difference in the relationship between sales performance and the behavior scales. The overall analysis indicated a relationship between sales percent to quota and independence. In the present study, Independence showed to be a statistically significant predictor of sales job performance in this sample; therefore, the null
hypothesis of research question 2 was rejected. However, Independence is only one out of twenty scales that were tested to influence performance.

**Chapter 4 Summary**

This quantitative research study used pre-existing data. The purpose of this study was to analyze the relationship between individual cognitive, behavioral, and motivational characteristics and sales quota attainment for three industrial sales organizations in West Virginia. Cognitive characteristics are divided into four factors (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Each of the factors has its own scale. In addition to these four scales, Cognitive has a fifth scale (learning index) that is a composite scale of the four cognitive sub-scales (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Behavior characteristics have nine factors (energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment) and no composite scale. Motivation characteristics have six factors (financial, people service, enterprising, creative, technical, and mechanical) and no composite scale.

An analysis of variance was used to test the hypotheses. As a result of the analysis, Independence was entered into the regression equation and was significantly related to sales performance, $F (1,236) = 18.286, p < .001$. The multiple correlation coefficient was .268, indicating approximately 7.18% of the variance in sales performance could be accounted for by independence alone. Chapter 5 includes a discussion of the implication for current practice. In addition, Chapter 5 will provide recommendations for future research.
CHAPTER 5. CONCLUSIONS AND DISCUSSION

Introduction

Chapter 5 provides an interpretation of the results of the quantitative research. Conclusions concerning rejection or non-rejection of the three null hypotheses are drawn. Implications of the results concerning assumptions that were made in literature are discussed also as well as implication for hiring selection practice. The limitations of the study were outlined and questions for further results formulated.

The expected findings of the proposed research were significant correlations between the independent variables and the dependent variables. In addition, significant correlations between groups of independent variables and the dependent variables were expected. Hunter and Hunter (1998) suggested the ability of assessments to predict job performance is directly proportional to the predictive validity coefficient of the assessment method. In addition, Hunter, Schmidt, and Judiesch (1990) found the use of assessments with increased predictive validity led to substantial increases in performance outcomes when measured in percentage increases in output. With this in mind, this research study expanded on the work of Hunter and Hunter (1998). Cognitive, behavior, and motivation characteristics were measured utilizing the ProfileXT© psychometric instrument.

While the expectations were to find significant correlations between the independent and the dependent variable, the researcher established a margin of error for analysis at the .05 level, \( p = 0.05 \). Pearson’s r correlation coefficient was used to determine the strength of the correlation.
Because the study was looking for predictors of sales performance, it examined moderately strong to strong correlations between independent and dependent variables. More specifically, this equated to bivariate correlation coefficients (r values) at or above 0.30 (Biddle, 2005).

**Summary of the Results & Findings**

This quantitative, research study used pre-existing data. The purpose of this study was to analyze the relationship between individual cognitive, behavioral, and motivational characteristics and sales quota attainment for three industrial sales organizations in West Virginia. The results and findings are outlined below.

There were three research questions:

- **R₁**: Is there a relationship between individual cognitive characteristics and sales quota attainment?
- **R₂**: Is there a relationship between individual behavior characteristics and sales quota attainment?
- **R₃**: Is there a relationship between individual motivation characteristics and sales quota attainment?

To examine the research questions, 20 independent variables (learning index, verbal skill, verbal reasoning, numerical ability, numeric reasoning, energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, objective judgment, financial, people service, enterprising, creative, technical, and mechanical) were correlated with the dependent variable (sales quota attainment). See Table 2. Out of these, 20 independent variables that were examined, only one (independence) showed a statistically significant correlation with the dependent variable (sales quota attainment). \( F(1,236) = 18.286, p < .001 \).
The multiple correlation coefficient was .268, indicating approximately 7.18% of the variance in sales performance could be accounted for by independence alone.

**Summary of the Quantitative Results in Relation to the Null Hypotheses**

**Null Hypothesis (H₀) for Research Question 1.** There was no relationship between individual cognitive characteristics and sales quota attainment. Cognitive characteristics include: verbal skill, verbal reasoning, numerical ability, and numerical reasoning. Each of the factors has its own scale. In addition to these four scales, Cognitive has a fifth scale (Learning Index) that is a composite scale of the four cognitive sub-scales: verbal skill, verbal reasoning, numerical ability, and numerical reasoning). As a result of the analysis, there was no significant correlation in the relationship between individual cognitive characteristics and sales quota attainment, neither on a composite scale level nor on a sub-scale level. The null hypothesis is not rejected.

**Null Hypothesis (H₀) for Research Question 2.** There was no relationship between individual behavior characteristics and sales quota attainment. Behavior characteristics is divided into 9 sub-scales: energy level, assertiveness, sociability, manageability, attitude, decisiveness, accommodating, independence, and objective judgment. The correlations between all sub-scales and the dependent variable was examined. A positive statistically significant relationship was found between sales percent to quota and one independent variable. Independence showed to be a statistically significant predictor of sales job performance in this sample; therefore, the null hypothesis was rejected. Although most of the behavior characteristics were not significantly correlated to the dependent variable, a statistically significant correlation between one behavior characteristic and the independent variable was enough to reject the null hypothesis because the null hypothesis excludes any correlation.
Null Hypothesis (H₀) for Research Question 3. There was no relationship between individual motivation characteristics and sales quota attainment. An ANOVA of the motivation scales indicated that one motivation scale was significant. As a result, if a sales person is interested in Technical, the sales performance tends to go down. Therefore, the result suggests that the null hypothesis should be rejected for research question 3. A significant correlation between one of the motivation characteristics and the dependent variable would be sufficient to reject the null hypothesis. The result is questionable because the scale is ipsative and could be manipulated. Therefore, it is not possible to decide whether the null hypothesis could be rejected or not. Both cases remain possibilities. Further research with normative scales is needed to make a decision on the null hypothesis for research question 3.

Discussion of the Results

Cognitive Characteristics. None of the independent variables that represented cognitive characteristics showed a statistically significant correlation with the dependent variable. Supporting the link from cognitive characteristics to sales performance were drawn from research investigating sales performance (Walker, Churchill, Ford, 1977; Weitz, 1978, 1979, 1981, Campbell, McCloy, Oppler & Sager, 1981; and Behram & Perreault, 1982). Each of these models pointed out the importance of personality, more specifically cognitive ability, and its impact on sales performance suggesting job performance has many variables and factors for consideration. The work of Hunter and Hunter (1984) supports a direct link from cognitive characteristics to sales performance; however, Sujan et al. (1994) suggested, “traditional assessments of cognitive ability are too narrow to encompass as predictors of salesperson performance” (p. 40). It was surprising cognitive characteristics did not make a positive contribution to salesperson performance in the research study. The literature suggested and
previously reviewed in Chapter 2 would indicate an expectation of cognitive ability to be a predictor in salesperson job performance. After investigating the relationship between cognitive characteristics and sales job performance in the study, the results did not support a positive relationship between the individual cognitive characteristics that were assessed via the ProfileXT© and sales quota attainment. There might be other cognitive characteristics that have predictive validity for sales performance but were not part of this study. Further research should examine this.

**Behavior Characteristics.** When it comes to behavior characteristics, one variable, independence, showed a statistically significant correlation. The findings suggest that the higher the independence score on a ProfileXT© assessment, the higher the performance of the salesperson in an industrial setting in West Virginia. There might be a number of possible explanations for this. The salesperson who has independence will more likely feel motivated in dealing with the task and being persuasive and resilient in situations required high negotiation skills. Salespeople who are higher in independence will be able to maximize interactions with clients. A salesperson high in independence will be able to set goals and targets and have greater control of the outcome. As correlations do not describe reasons behind them, further research is needed to gain a better understanding of why independence contributes to sales performance.

In addition, the scale of independence only explains 7.8% of the variance in sales performance, about 92% remains unexplained which leaves doubt if it makes sense to test independence during hiring section. As the part of the performance that was explained is so small, even good results in independence do not predict sales performance. Obviously, there are numerous additional factors that come in to play. It is not even clear if some of these factors are individual characteristics such as independence or if the majority of these factors are
environmental support (incentives, information, and resources), but it is clear much more than knowledge about a person’s independence is needed to predict sales performance.

**Motivation Characteristics.** The analysis of variance indicated a significant difference in mean percent sales quota achieved between those who selected Technical as their area of interest and those who did not. Since those not selecting Technical as a motivation area show a higher percent to quota than those who do select it, there is a negative correlation between sales performance and the actual scale score for the Technical motivation category.

As mentioned earlier, motivation characteristics are ipsative. Motivation characteristics were focused on the individual interests and preferences. They can be manipulated, and therefore are not suitable to be used as a predictive value in hiring selection. See Chapter 4, Table 9 and 10.

The conclusions indicate there is still much to learn about the various characteristics of an individual salesperson and the relationship to job performance. Since the present research study used pre-existing data that was not personally identified, the research was unbiased. The statistical analysis for this study was straightforward, the researcher was unbiased as to the research results, and the design was simplistic ensuring statistical analysis was adequate to draw valid and reliable conclusions. Further research into the variables will perhaps create consistency among the various conclusions.

**Discussion of the Results in Relation to the Literature**

While difference in salesperson performance were easily observed, the root cause is not well understood even though the literature clearly indicates a substantial amount of effort in gaining a deeper understanding of salesperson job performance (Szymanski, 1988). As previously discussed, the two meta-analyses (Churchill et al., 1985; Ford et al., 1987) were
conducted to gain understanding of the factors related to salesperson performance. The results of
the meta-analyses indicated there was not one factor singled-out as a predictor of salesperson
performance. The findings of Churchill et al. (1985) were not consistent with the research of
Hunter (1986). The methodological concerns have been limitations, and it makes sense to
continue the investigation between cognitive characteristics and sales job performance, although
the authors do not see their research results as the final word (Churchill, personal
communication, 1995, Appendix B).

The only relationship supported by the results of this study is the positive relationship
between independence and salesperson performance. Independence does lead to higher levels of
performance, and while it explains 7.8% of the variance in sales quota achievement, it is a small
part but still statistically significant. Surprisingly, the relationship between cognitive
characteristics and performance was not significant. However, once again, this is not consistent
with the literature of the subject of cognitive characteristics and salesperson job performance.

For the reasons discussed, Gilbert’s assumption that individual capacity and motivation
are low leverage [low impact] for performance might be right. At least this study only found one
independent variable, independence, significant out of 20. As there is no agreed on list of
individual characteristics that influence performance, there might be more than the ones
investigated in this study. Still the results of this study do not allow a conclusion that individual
capacity is a big lever for hiring selection. Therefore, the results of this study are not supportive
in contradicting Gilbert’s assumption. This contradicts the researcher’s expected results. This
study does not provide any insight that Gilbert’s assumption that environmental or organizational
support is probably more important than individual capacity might be inaccurate.
While theoretical implications of the study are limited from a statistical point of view, the results suggest further investigation continuing to ask questions regarding the relationship between cognitive, behavior, and motivation characteristics and sales performance outcomes. In case research broadens the focus beyond individual characteristics that could be used in hiring selection, a much more comprehensive approach would make sense. As an example, a question would be to view salesperson performance from a systems approach that covers the six boxes in Gilbert’s (1978) Behavior Engineering Model while also using the Van Tiem, Dessinger, and Moseley’s (2012) Performance Improvement/HPT Model to follow the whole performance improvement process systematically.

**Limitations**

Through the use of quantitative pre-existing data, the present research study addressed the research questions by determining if individual characteristics have predictive validity for sales performance, and what are the characteristics with the biggest impact. While a quantitative design was appropriate and the study performed multiple regression analysis to examine the predictive validity of the characteristics on sales job performance, quantitative research has its limitations. It tells us about correlations but it does not tell us anything about the reasons behind these correlations. Qualitative information through interviews would provide the researcher the ability to gain additional understandings regarding the research problem especially regarding the reasons why variables correlate (Brinkerhoff, 2003, 2005, 2006; Creswell 2009).

Another limitation was the sample size. The researcher relied on data sets collected from pre-existing records in the participating organizations. Originally, the researcher was told by company executives sales percent to quota from 2012-2014 existed for the sample size. Across three organizations, this was not the case upon further investigation. As a result, the sample size
was 238 instead of 300, which were previously decided prior to the data collection. Therefore, the results cannot be generalized across populations. Accordingly, additional samples could be employed to better understand the individual characteristics and the relationship to sales job performance.

Another limitation is job performance was only measured by sales percent to quota attainment for 2012-2014. A combination of additional measures such as supervisor rating might be beneficial to detect more correlations. For future research, it would be important to include all sales representatives in all three organizations ensuring data was available for the sample population including both assessment results and sales percent to quota for all three years.

Another limitation of this study was the self-reported motivation score. In future research, it would be beneficial to incorporate a different method for measuring motivation that included normative results. This would allow motivation to be measured in relationship to sales job performance.

**Implication of the Results for Practice**

Minton-Eversole (2010) included an interesting discussion in an article in HR Magazine. The article explained why hiring selection practitioners needed to become more educated on the utilizing of assessments for hiring selection. Minton-Eversole (2010) pointed out, “the performance ramifications associated with poor employee selection makes this a critical competency for all Human Resources professionals” (Testing Demands section, para 4). Elaine Pulakos, Chief Operations Officer (COO) for Previsor, an industrial psychology consulting firm, suggests that “many HR professionals have misconceptions about both the value of formal assessments and the types of assessments that have been proven to be most effective” (Testing
Demands, section para 6-7). Roberts (2011a), in his article “Hire Intelligence”, discussed the state of the Human Resource profession as it relates to data-driven decision-making stating “just a few years ago, HR professionals struggled to understand chi square and correlation coefficients” (para 4). As performance improvement practitioners, we have to move beyond metrics and understand how to analyze the data versus relying on subjective and intuitive hiring selection decisions. Konig, Berchtold, and Kleinmann (2010) suggested, “The scientist-practitioner gap in personnel selection is large” (p. 19).

Predicting the future performance of job applicants has important implications for any organization, since the difference between the economic value of the work output of high performers and that of low performers is significant (Le, Oh, Shaffer, & Schmidt, 2007, p. 6). Literature clearly indicates a predictive capability for cognitive ability. Based on this result of the study, there are three distinctive implications for practitioners in hiring selection and improving the performance of the hiring selection system.

First, psychological assessments as predictors for job performance need to measure the right factors. In the case of cognitive characteristics, Hunter and Hunter (1984) conclude using psychometric assessment to measure cognitive ability makes sense. Since cognitive ability has played a central role in predicting performance, Schmidt (2002) suggested, “There cannot be a debate on this issue” (p. 187). However, there are many different ways to divide cognitive characteristics into factors and not all of these factors seem to be able to predict job performance. Hunter and Hunter (1984) found positive correlations between General Mental Ability and conscientiousness as cognitive factors and job performance. Not all psychometric tools cover these factors. ProfileXT© divides cognitive characteristics into four factors (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). Each of the factors has its own scale. In
addition to these four scales, Cognitive has a fifth scale (learning index) that is a composite scale of the other four cognitive scales (verbal skill, verbal reasoning, numerical ability, and numerical reasoning). The study showed no statistically significant correlations between these factors and sales quota achievement. An implication for practitioners; therefore, is to select psychometric instruments that cover the relevant cognitive factors in case they want to use the assessment results as a predictor for job performance (Hunter & Hunter, 1984).

Second, in instances where the practitioners are utilizing a psychometric assessment tool, it is important to ensure that the assessment tool does not only cover the relevant factors but also that the factors or a combination of these factors explain a big enough part of the variance in job performance. In the present study, independence explained 7.8% of the variance in sales performance. This hardly seems to be enough to base a hiring decision on since 92.2% of the variance remained unexplained. This means that other variables play into sales job performance and, when they are not known and assessed, the biggest part of performance cannot be predicted. For practitioners, it is therefore important to use instruments or a combination of instruments that can predict a big enough percentage of the variance in job performance to make the results relevant for hiring selection decisions.

Third, Cascio and Aguinis (2005) suggest, “The validity of selection measures is fundamental to useful personnel selection practice” (p. 30). Manipulation of assessments tools could result if an assessment tool contains ipsative scales. See Chapter 4. Therefore, the parts of an assessment tool based on ipsative scales cannot be used to make hiring selection decisions. Using psychometric assessments based on normative scales will eliminate manipulation and ensure validity. Violation of the Equal Employment Opportunity Commission’s Uniform Guidelines on Employee Selection (U.S. Department of Labor, 1999), which regulates the
methods for establishing validity, and fairness in selection, could results when utilizing an ipsative measure because ipsative measures are self-reported.

**Recommendations for Further Research**

There are five general recommendation for further research in the area of sales job performance based on cognitive and behavior characteristics. While there are empirical challenges noted in the literature regarding behavior and the link to job performance, there are also empirical studies that support this link.

The first recommendation is to measure the behaviors of sales representatives in other settings outside of the sample and region contained in this study. A limitation in the present study was the fact that salespeople represented three organizations in West Virginia. Differences in results might likely appear with a more diverse sample population. It would be interesting to extend the same study into other industries and types of sales positions considered more complex or easier than the current sample. The predictive value of individual characteristics might have different results with a different sample based on the complexity of the salesperson position.

A second recommendation is to include demographic data as a part of a future research study. Gender, race, education level, age, tenure, experience, marital status, as well as previous occupations, might be considered when explaining sales job performance. Salgado (1999) suggested biographical information adds to predictive validity in studies related to job performance. A quantitative approach that takes more of the above-mentioned data into account could prove fruitful.

A third recommendation would be to refine the data collection process to differentiate between inside and outside sales representatives in different regions selling the same product
lines. In addition, including a larger sample across other sales industries and companies would provide an opportunity to dig deeper into the variables. There seem to be so many unexplored factors that play into job performance that any research that examines additional factors to the ones of this study could provide valuable insight.

A fourth recommendation would be to use measures for performance other than percent to sales quota. Lilford, Vigar-Ellis, and Nel (2014) suggested, the performance of a salesperson can be assessed in two fundamental ways: objectively or subjectively” (p. 148). For example, supervisor ratings (subjective), percent to change in revenue or goals over a longer time-frame (objective) than three years may be other indicators to measure sales job performance. Lilford et al. (2014) further suggest “objective assessments are limited in that they are not easy to take into account when market conditions change or when salespersons vary in terms of experience” (p. 148). Further research is required to extend the knowledge and possibilities of measurements for performance that may provide an opportunity to generalize across populations thus influencing subsequent models.

A fifth recommendation might be to investigate this topic with a mixed-method design including qualitative approaches to the methodology to provide for a more fruitful discussion on the topic of individual and environmental or organizational supports which play a role in sales job performance. While quantitative data is important for understanding the prediction of sales job performance and the relationship between cognitive behavior, and motivation characteristics, qualitative information from individual salespeople could provide good insight in the process of establishing a link between individual and environmental supports as well as individual characteristics and job performance. Compiling data from interviews, observations, and focus group (Strauss & Corbin, 1990), would allow for a deeper investigation in sales job performance.
Further research might prove fruitful if one would take the main assumption of this dissertation namely that personal characteristics have predictive value for job performance and test it in other areas of performance not only in sales. One setting might concentrate on performance that is easy to measure and easy to attribute to individuals like sales quota. For example, in a hospital setting, this same study could be replicated where performance is easy to measure quantitatively and easy to attribute to individually. The research questions would basically remain the same; however, the results of further research might show that the results of this dissertation of transferable to other kinds of performance.

In addition, the assumption that personal characteristics influence performance can be taken to more complex settings where performance is multidimensional and performance results are not as easily attributable to individuals. This would include multidimensional definitions of performance and a model allowing one to see what percentage of the performance could be individually attributable. It would be much more complex to find out which personal characteristics would have predictive value for those dimensions of performance that are individually attributable.

As Chapter 2 showed, there are different positions in literature regarding individual characteristics and the link to job performance, there are empirical studies which support this link and there are others that do not. The statistical methods for quantifying the results differ across the studies. Therefore, a focus of future research also should be on how methodological considerations impact results. This applies to all the five recommendations on future research.
Conclusion

The purpose of this study was to determine if a relationship existed between individual cognitive, behavior, and motivation characteristics (the independent variables) and sales job performance (the dependent variable) to improve hiring decisions. The subject of hiring the best candidate for a position has been researched for many years. A hiring mistake costs organizations several thousand and potentially millions of dollars. Sangeetha (2010) suggests, “Hiring high-performing talent is increasingly a critical success factor in the competitive business environment” (p. 94). The present research study contributes to the body of knowledge of hiring selection approaches by examining the correlations between these individual characteristics of salespersons as independent variables and sales quota achievement as a dependent variable.

The study took a quantitative approach based on pre-existing data that was collected using the ProfileXT©. The study examined three research hypothesis. Correlation and regression analysis were used to examine Hypothesis 1 and Hypothesis 2. Hypothesis 3 was examined using ANOVA (analysis of variance) since the scales that covered hypothesis 3 were ipsative.

A Pearson’s $r$ correlation coefficient was calculated to determine the strength of the relationship between the independent and the dependent variables. The significance level was set at $p=0.05$.

The results concerning the hypotheses are as follows:

Null Hypothesis (H$_0$) for Research Question 1. As a result of the analysis, there was no significant correlation in the relationship between individual cognitive characteristics and sales
quota attainment; neither on a composite scale level nor on a sub-scale level. The null hypothesis was not rejected.

Null Hypothesis (H₀) for Research Question 2. A positive statistically significant relationship was found between sales percent to quota and one independent variable: independence. Independence showed to be a statistically significant predictor of sales job performance in this sample; therefore, the null hypothesis was rejected.

Null Hypothesis (H₀) for Research Question 3. A significant correlation between one of the motivation characteristics (technical) and the dependent variable was found and this would have been sufficient to reject the null hypothesis. However, the result is questionable because the scale is ipsative and can be manipulated. Therefore, it is not possible to decide whether the null hypothesis can be rejected or not. Both cases remain possibilities. Further research with normative scales is needed to make a decision on the null hypothesis for research question 3.

Gilbert’s (1978) Behavior Engineering Model and Van Tiem, Dessinger, and Mosley (2012) Performance Improvement/HPT Model were used to provide the theoretical framework for this study. Gilbert had the assumption that individual characteristics and selection based on these characteristics are of low leverage [low impact] to improve performance. The study findings provided no findings that contradict Gilbert’s (1978) assumption that hiring selection and individual characteristics of performers are a low leverage [low impact] for performance.

Van Tiem, Moseley, and Dessinger’s (2012) Performance Improvement/HPT Model provides a much more comprehensive framework to solve performance problems than the limited focus of this study. Due to the focused research questions, this study only referenced gap analysis as a small part of the model. As the results of this study indicate that job performance depends on many more factors than the ones assessed in this study, a broader approach to
examine what factors can predict job performance would be helpful. Van Tiem, Moseley, and Dessinger’s (2012) Performance Improvement/HPT Model would be the appropriate framework to guide such a more comprehensive approach.

The main purpose of this study was to examine the relationship between cognitive, behavior, and motivation characteristics and sales performance outcomes. The results showed that independence positively correlates with sales performance in the current population. Still the study raised more questions than it was able to answer. Literature showed that independence is neither the only factor that explains variance in sales performance nor is it the factor that can explain as a single factor enough of the variance in sales performance to justify basing hiring decisions on it. The challenge now is to understand better the other 92.2% of the variation in sales performance to be able to build a hiring selection approach on this understanding that has significant predictive validity for sales performance. The researcher hopes additional studies will be conducted.
REFERENCES


APPENDIX A. STATEMENT OF ORIGINAL WORK

Academic Honesty Policy

Capella University’s Academic Honesty Policy (3.01.01) holds learners accountable for the integrity of work they submit, which includes but is not limited to discussion postings, assignments, comprehensive exams, and the dissertation or capstone project.

Established in the Policy are the expectations for original work, rationale for the policy, definition of terms that pertain to academic honesty and original work, and disciplinary consequences of academic dishonesty. Also stated in the Policy is the expectation that learners will follow APA rules for citing another person’s ideas or works.

The following standards for original work and definition of plagiarism are discussed in the Policy:

Learners are expected to be the sole authors of their work and to acknowledge the authorship of others’ work through proper citation and reference. Use of another person’s ideas, including another learner’s, without proper reference or citation constitutes plagiarism and academic dishonesty and is prohibited conduct. (p. 1)

Plagiarism is one example of academic dishonesty. Plagiarism is presenting someone else’s ideas or work as your own. Plagiarism also includes copying verbatim or rephrasing ideas without properly acknowledging the source by author, date, and publication medium. (p. 2)

Capella University’s Research Misconduct Policy (3.03.06) holds learners accountable for research integrity. What constitutes research misconduct is discussed in the Policy:

Research misconduct includes but is not limited to falsification, fabrication, plagiarism, misappropriation, or other practices that seriously deviate from those that are commonly accepted within the academic community for proposing, conducting, or reviewing research, or in reporting research results. (p. 1)

Learners failing to abide by these policies are subject to consequences, including but not limited to dismissal or revocation of the degree.
Statement of Original Work and Signature

I have read, understood, and abided by Capella University’s Academic Honesty Policy (3.01.01) and Research Misconduct Policy (3.03.06), including the Policy Statements, Rationale, and Definitions.

I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the APA Publication Manual.

Valerie L. Bernard – July 20, 2015

Dr. Darlene Van Tiem, School of Education, Capella University
APPENDIX B – SITE PERMISSION LETTER

Month, Date, Year

Organization #1
Organization #2
Organization #3

Dear [Research Site’s Official Name],

I am working on a doctoral dissertation, entitled, “The Relationship between Individual Cognitive, Behavior, and Motivation Characteristics and Sales Job Performance.” My research will be overseen by my faculty mentor, Dr. Darlene Van Tiem.

Quantitatively, the study will determine if cognitive, behavior, and motivation characteristics impact performance outcomes measured by based on percent to sales quota at three industrial sales organizations in West Virginia. My research questions will determine whether there is a relationship between individual characteristics and sales quota attainment. I will be recruiting 300 sale

The target population for the research study includes 300 industrial sales representatives from three organizations in West Virginia who have completed a ProfileXT© between 2012-2014. The main research tools used in this study are the ProfileXT© psychometric assessment tool, and the power tables in Statistical Power Analysis for the Behavioral Sciences.

I am requesting permission to conduct my dissertation research at [insert name of site].

Specifically, I am requesting permission to engage in the following research activities:

- Collect ProfileXT© results from 2012-2014 for salespersons in your organization
- Collect Sales Percent to Quota Results for 2012-2014

This project will begin once I have obtained approval from Capella University’s Institutional Review Board (IRB), which will review my study to ensure the adequacy of my plan for protecting participants. My anticipated projected start date is May 2015.

Any data collected will be kept confidential. In accordance with Capella policy and best practices for ethical research, neither participants nor sites will be identified in any report of my findings or in my published dissertation. I will provide a copy of the aggregate results from this study upon your request.

If you have any concerns about this request please contact me at the phone number listed below.

Sincerely,

Valerie Bernard
Email: valerie@executivetrainingcenters.com
Cell: 304.941.4653
APPENDIX C - CONFIDENTIALITY AGREEMENT

This Confidentiality Agreement states the entire agreement between the researcher and research assistant concerning the disclosure of personally identifiable, confidential, or proprietary information concerning the research study titled, “The Relationship between Individual Cognitive, Behavior, and Motivation Characteristics and Sales Job Performance” by Valerie Bernard (hereafter referred to as “Confidential Information”).

It is understood and agreed to that the information set forth below and otherwise provided directly or indirectly by the research participants to the research assistant may contain Confidential Information. As a condition to receiving the Confidential Information, I, the research assistant, who may witness, hear, receive, and/or obtain the Confidential Information, hereby understand and agree to the following:

I. Not disclose the Confidential Information provided by research participants to any third party or use for any purpose other than what has been approved by the Capella University Institutional Review Board (IRB).

II. Follow the IRB approved process of collecting ProfileXT© results and sales percent to quota for three consecutive years from 2012-2014. After collecting the data, the data will be sent to the researcher with no identifiers.

III. Abide by this Confidentiality Agreement that is enforced to protect the confidentiality of research participants. If this agreement is breached, I, the research assistant and the researcher, will be subject to applicable and appropriate legal and/or academic sanctions.

WHEREFORE, I acknowledge that I have read and understand this Agreement and accept the duties and obligations set forth herein.

Research Assistant:

Name (Print): __________________________________________________________

Signature: ____________________________________________________________

Date: __________________________________________________________________

Researcher:

Name: Valerie Bernard

Signature: ____________________________________________________________

Date: __________________________________________________________________
The ProfileXT©, psychometric assessment, was selected for use in this research study because of the reliability and validity of the instrument. The ProfileXT© was designed to test three areas: cognitive, behavior, and motivation. The 8th edition of the technical manual for the ProfileXT© was completed in 2014. The ProfileXT© assessment utilizes proprietary software. The assessment results are shown on the individual report as a scale of ten (STEN) scores. The ProfileXT© is administered online and is not a timed assessment.

Davis (1992), Grant and Davis (1998), Rubio, Berg-Weger, Tebb, Lee & Rauch (2003) established the steps necessary for establishing content validity for a psychometric assessment tool. Following these steps, the ProfileXT© established the content validity analysis for the ProfileXT©. Hammond (2001) suggested Cronbach’s alpha coefficient as one of the most accurate assessments for calculating the reliability of an instrument. Table D1 references content validity for the domains of the ProfileXT© (PXT). Table D2 references content validity for the cognitive characteristics. Table D3 references coefficient alpha reliability analysis for the behavior characteristics scales. Table D4 references coefficient alpha reliability analysis for the motivation/interest characteristics. More detailed information can be found in the 81 pages of the ProfileXT© Technical Manual which includes recent studies on concurrent validity, equity, and empirical evidence from the literature which establish the reliability and content validity of this instrument.

Table D1. ProfileXT© Content Validity Summary

<table>
<thead>
<tr>
<th>ProfileXT© Domain</th>
<th>Number of Items</th>
<th>Inter-Rater Agreement</th>
<th>Context Validity Index</th>
<th>Factorial Validity Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>77</td>
<td>.912</td>
<td>.924</td>
<td>.920</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Behavior</td>
<td>182</td>
<td>.785</td>
<td>.798</td>
<td>.776</td>
</tr>
<tr>
<td>Motivation/Interest</td>
<td>110</td>
<td>.844</td>
<td>.821</td>
<td>.833</td>
</tr>
<tr>
<td>Overall</td>
<td>369</td>
<td>.847</td>
<td>.848</td>
<td>.843</td>
</tr>
</tbody>
</table>

Note. From The ProfileXT© Technical Manual (p. 1-5), Copyright 2014 by Profiles International, Inc. Reprinted with permission

Table D2. Coefficient Alpha Reliability Analysis Cognitive Characteristics

<table>
<thead>
<tr>
<th>ProfileXT© Scales</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Index</td>
<td>.92</td>
</tr>
<tr>
<td>Verbal Skill</td>
<td>.78</td>
</tr>
<tr>
<td>Verbal Reasoning</td>
<td>.75</td>
</tr>
<tr>
<td>Numerical Ability</td>
<td>.82</td>
</tr>
<tr>
<td>Numeric Reasoning</td>
<td>.80</td>
</tr>
<tr>
<td>Average</td>
<td>.79</td>
</tr>
</tbody>
</table>

Note: From The ProfileXT© Technical Manual (p. 3-25), Copyright 2014 by Profiles International, Inc. Reprinted with permission.

Table D3. Coefficient Alpha Reliability Analysis Behavior Characteristics

<table>
<thead>
<tr>
<th>ProfileXT© Scales</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decisiveness</td>
<td>.74</td>
</tr>
<tr>
<td>Energy</td>
<td>.74</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>.77</td>
</tr>
<tr>
<td>Sociability</td>
<td>.85</td>
</tr>
<tr>
<td>Manageability</td>
<td>.75</td>
</tr>
<tr>
<td>Attitude</td>
<td>.81</td>
</tr>
<tr>
<td>Accommodating</td>
<td>.73</td>
</tr>
<tr>
<td>------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Independence</td>
<td>.81</td>
</tr>
<tr>
<td>Objective Judgment</td>
<td>.77</td>
</tr>
<tr>
<td>Mean</td>
<td>.77</td>
</tr>
</tbody>
</table>

Table D4. Coefficient Alpha Reliability Analysis Motivation/Interest Characteristics Coefficient alpha average = .76. (N=108,685)

<table>
<thead>
<tr>
<th>ProfileXT©© Scales</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprising</td>
<td>.81</td>
</tr>
<tr>
<td>Financial/Administrative</td>
<td>.73</td>
</tr>
<tr>
<td>People Service</td>
<td>.74</td>
</tr>
<tr>
<td>Sociability</td>
<td>.71</td>
</tr>
<tr>
<td>Technical</td>
<td>.71</td>
</tr>
<tr>
<td>Mechanical</td>
<td>.81</td>
</tr>
<tr>
<td>Creative</td>
<td>.77</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Low</th>
<th>Thinking Scales</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetition and hands-on learning can be effective in training</td>
<td><strong>Learning Index</strong> - an index of expected learning, reasoning, and problem solving potential. It is a composite of the scores for <strong>Verbal Skill</strong>, <strong>Verbal Reasoning</strong>, <strong>Numerical Ability</strong>, and <strong>Numeric Reasoning</strong>. The ability to respond efficiently in a training situation can typically be found in an individual with a high Learning Index. Such an individual can communicate complex ideas through data, words, or both in an effective manner. At the low end, an individual may be most comfortable with responsibilities which emphasize concrete thinking and routine tasks.</td>
<td>Strong capacity to adapt quickly in a learning situation Typically finds it easy to learn the requirements of a new job situation</td>
</tr>
<tr>
<td>Achieves best through learning specific to the job</td>
<td>May be slow and deliberate communicating ideas</td>
<td>Capable of precise communication even under strict time constraints Competent understanding of written and verbal information</td>
</tr>
<tr>
<td>May be slow and deliberate communicating ideas</td>
<td><strong>Verbal Skill</strong> - a measure of verbal skill through vocabulary. High Verbal Skill is often associated with confidence in vocabulary. However, the individual may occasionally talk above the level of comprehension of others. Lower scorers do not demonstrate a strong command of vocabulary and may utilize vague or inaccurate expressions when they communicate.</td>
<td>Strong information gathering ability Assimilates verbal information rapidly</td>
</tr>
<tr>
<td>Communications are concrete and straightforward</td>
<td>May require more time to assimilate new information of a verbal or written nature</td>
<td>May draw abstract conclusions from</td>
</tr>
<tr>
<td>May require more time to assimilate new information of a verbal or written nature</td>
<td><strong>Verbal Reasoning</strong> - relates to using words as a basis in reasoning and problem solving. High Verbal Reasoning suggests a strong potential for understanding verbal information both quickly and accurately. They may find concrete and routine problem solving tedious. A low scorer could overlook inferences in verbal or written data. This individual may be most comfortable with responsibilities which do not</td>
<td></td>
</tr>
</tbody>
</table>
Using mathematics may be challenging. Figuring numerical problems may require the use of a calculator.

**Numerical Ability** - a measure of numeric calculation ability; how well an individual works with numbers.

High Numerical Ability is often associated with being confident when calculating numerical data. Often, decisions may be made quickly based on such data, without having to refer to calculation tools since the work is often done mentally.

Lower scorers will often rely on calculators or other aids to solve numerical problems. They may be

<table>
<thead>
<tr>
<th>Able to quickly determine mathematical solutions to problems mentally</th>
<th>Demonstrates a sound understanding of basic mathematical</th>
</tr>
</thead>
</table>

May overlook the implications derived from a set of numerical data.

May be comfortable using simple calculations for problem solving.

**Numeric Reasoning** - this scale measures an individual’s ability to use numbers as a basis in reasoning and problem solving.

Utilization of statistical inference is common among those with high Numeric Reasoning scores. The ability to visualize trends in a set of numerical data is likely to occur in such individuals.

Lower scorers may be most comfortable with positions which rarely utilize numerical forms of

<table>
<thead>
<tr>
<th>Demonstrates little difficulty in assimilating new information of a numerical nature</th>
<th>May process numerical data to reach conclusions or understand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Behavioral Scales</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Patient</td>
<td><strong>Energy Level</strong> - tendency to display endurance and a capacity for a fast pace. This scale deals with issues such as efficiency and time utilization.</td>
</tr>
<tr>
<td>Good with routine processes</td>
<td>The potential for activity, restlessness and seeking excitement and challenge can be found in an individual with a high Energy Level.</td>
</tr>
<tr>
<td>Methodical task focus</td>
<td>At the low end, an individual provides the patience and calmness fundamental to sedentary kinds of work.</td>
</tr>
<tr>
<td>Willing to accept a leader</td>
<td><strong>Assertiveness</strong> – tendency to take charge of people and situations. Leads more than follows. Identified as a measure of generalized influence. It is often associated with expressing confidence.</td>
</tr>
<tr>
<td>Diplomatic</td>
<td>High Assertiveness is often found with a focus on achievement and a seeking of leadership and the control of situations.</td>
</tr>
<tr>
<td>Low need to control others</td>
<td>Lower scores suggest a minimal need to control the actions of others. Such an individual may</td>
</tr>
<tr>
<td>Avoids small talk Keeps to one’s self</td>
<td><strong>Sociability</strong> – tendency to be outgoing, people-oriented, and participate with others. A strong measure of social presence. It directly relates to one’s desire for group associations. This trait relates to maintaining interpersonal contacts and group activities.</td>
</tr>
<tr>
<td>Is less likely to become frustrated by a lack of social</td>
<td>High Sociability signifies a desire to work closely with others and accomplish goals in a group setting.</td>
</tr>
<tr>
<td></td>
<td>A low scorer tends to focus on achieving goals through individual efforts and can work over</td>
</tr>
<tr>
<td>Manageability – tendency to follow policies, accept external controls and supervision, and work within the rules. Suggests a strong relationship to social responsibility and stability. It is a measure of how one reacts to the limits placed by authority and the acceptance of established procedures.</td>
<td>Compliant with procedures</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>High Manageability is often associated with being comfortable with authority and rules, applying procedures to one’s responsibilities, conformity, and being conventional. Lower scores reflect a working style that emphasizes individualized thinking and a willingness to question inefficient practices. This kind of person is not usually willing to blindly do the accepted thing.</td>
<td>Compliant with procedures</td>
</tr>
<tr>
<td>Attitude – tendency to have a positive attitude regarding people and outcomes. Measures the degree to which one is willing to trust others. It relates to the tendency to suspend judgments about others. A positive and accepting outlook regarding people and outcomes is common among those with high Attitude scores. Lower scorers are willing to question the intentions</td>
<td>Optimistic</td>
</tr>
<tr>
<td>Decisiveness – uses available information to make decisions quickly. Reflects how confident someone is for accepting the risk of making a decision in a timely fashion using what information is available at the time. A person with a high Decisiveness score will make decisions with the information currently available so processes do not become too mired in deliberation. This also reflects their willingness to risk failure or misjudgment for the sake of timeliness.</td>
<td>Moves quickly when making decisions</td>
</tr>
<tr>
<td>May seem contradictor y</td>
<td><strong>Accommodating</strong> – tendency to be friendly, cooperative, and agreeable. To be a team person. Often associated with concern for group accountability. A willingness to consider the needs and ideas of others is typical. The high Accommodating person holds group harmony and compromise as important guidelines for behavior. On the other hand, the low Accommodating individual is willing to express disagreement and defend priorities without compromise when necessary. Cooperativ e Harmonio us</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>May be disagreeable on occasion</td>
<td>Independence – tendency to be self-reliant, self-directed, to take independent action, and make own decisions. Defines the manner in which an individual prefers to be directed by others and one’s potential to accomplish tasks with minimal supervision. A person with high Independence prefers to take responsibility for accomplishing goals autonomously. Adventurous Slow to seek guidance Likes to set own direction</td>
</tr>
<tr>
<td>Will not typically follow the group just</td>
<td><strong>Objective Judgment</strong> – the ability to think clearly and be objective in decision making. Reflects the willingness to use either observable information or intuition in decision making. This is often referred to as the balance between thinking through the details of a situation and going with one’s feelings and intuition. High scores describe an individual who will trust observable facts in his or her problem-solving processes. Comfortable with a logical approach Unemotional thinking</td>
</tr>
<tr>
<td>May seek support Dependent on structure Accepts supervision easily</td>
<td>Intuitive Will follow a hunch Not overly bound by systematic thinking</td>
</tr>
<tr>
<td>Interests Scales</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Enterprising</strong></td>
<td>indicates an interest in activities in which one uses persuasiveness and enjoys presenting ideas and leading others.</td>
</tr>
<tr>
<td><strong>Financial/Administrative</strong></td>
<td>indicates interest in activities that involve the organization or coordination of information, the administration of business procedures, the processing of financial data, conventional office routines, etc.</td>
</tr>
<tr>
<td><strong>People Service</strong></td>
<td>indicates interest in activities that involve helping people, tending to the welfare of others, reaching compromises, working with others, etc.</td>
</tr>
<tr>
<td><strong>Technical</strong></td>
<td>indicates interest in activities that center on scientific and technical activities, research, and intellectual skills.</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td>indicates interest in activities that involve applied vocations with tools and machinery as well as work that involves various trades or the outdoors.</td>
</tr>
<tr>
<td><strong>Creative</strong></td>
<td>indicates interest in activities where one may be imaginative, original, and artistic.</td>
</tr>
</tbody>
</table>
APPENDIX F. TABLE REFERENCE

Table 1

(ProfileXT® Characteristics Including Scales and Sub-scales)

<table>
<thead>
<tr>
<th>Individual Cognitive Characteristics (4 factors)</th>
<th>Individual Behavior Characteristics (9 factors)</th>
<th>Individual Motivation/Interest Characteristic (6 factors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Index (Scale)</td>
<td>Energy Level (Scale)</td>
<td>Financial (Scale)</td>
</tr>
<tr>
<td>*Composite of Sub-Scales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Skill (Sub-scale)</td>
<td>Assertiveness (Scale)</td>
<td>People Service (Scale)</td>
</tr>
<tr>
<td>Verbal Reasoning (Sub-scale)</td>
<td>Sociability (Scale)</td>
<td>Enterprising (Scale)</td>
</tr>
<tr>
<td>Numerical Ability (Sub-scale)</td>
<td>Manageability (Scale)</td>
<td>Creative (Scale)</td>
</tr>
<tr>
<td>Numeric Reasoning (Sub-scale)</td>
<td>Attitude (Scale)</td>
<td>Technical (Scale)</td>
</tr>
<tr>
<td></td>
<td>Decisiveness (Scale)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accommodating (Scale)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Independence (Scale)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Objective Judgment (Scale)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2

(Characteristics, Scales, and Sub-scales of the ProfileXT® Outlining Independent Variables)

<table>
<thead>
<tr>
<th>Individual Cognitive Characteristics (4 factors)</th>
<th>Individual Behavior Characteristics (9 factors)</th>
<th>Individual Motivation/Interest Characteristics (6 factors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Index (Scale)</td>
<td>There is no composite of the nine Individual Behavior Scales, that would serve as an independent variable here</td>
<td>There is no composite of the six Motivation/ Interest Scales, that would serve as an independent variable here</td>
</tr>
<tr>
<td>*Composite of four Sub-Scales</td>
<td>No Independent variable</td>
<td>No Independent variable</td>
</tr>
<tr>
<td>Independent variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Skill (Sub-scale)</td>
<td>Energy Level (Scale)</td>
<td>Financial (Scale)</td>
</tr>
<tr>
<td>Independent variable</td>
<td>Independent variable</td>
<td>Independent variable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>Behavior</td>
<td>Motivation/Interest</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Learning Index</td>
<td>Energy Level</td>
<td>Financial</td>
</tr>
<tr>
<td>Verbal Skill</td>
<td>Assertiveness</td>
<td>People Service</td>
</tr>
<tr>
<td>Verbal Reasoning</td>
<td>Sociability</td>
<td>Enterprising</td>
</tr>
<tr>
<td>Numerical Ability</td>
<td>Manageability</td>
<td>Creative</td>
</tr>
<tr>
<td>Numeric Reasoning</td>
<td>Attitude</td>
<td>Technical</td>
</tr>
<tr>
<td></td>
<td>Decisiveness</td>
<td>Mechanical</td>
</tr>
<tr>
<td></td>
<td>Accommodating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Independence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Objective Judgment</td>
<td></td>
</tr>
</tbody>
</table>

(Profile International, I., 2007)
Table 4

**Descriptive Statistics for the Sales Performance Dependent Variables (2012-2014)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales2012</td>
<td>212</td>
<td>.00</td>
<td>394.98</td>
<td>85.8930</td>
<td>63.89350</td>
</tr>
<tr>
<td>Sales2013</td>
<td>230</td>
<td>.00</td>
<td>263.96</td>
<td>86.9152</td>
<td>51.99901</td>
</tr>
<tr>
<td>Sales2014</td>
<td>234</td>
<td>.00</td>
<td>227.41</td>
<td>102.7264</td>
<td>54.42666</td>
</tr>
<tr>
<td>Avg_Pcnt</td>
<td>242</td>
<td>.17</td>
<td>197.28</td>
<td>91.4157</td>
<td>44.03477</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>206</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5

**Descriptive Statistics for Independent Variables (n=238)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Index</td>
<td>238</td>
<td>5.70</td>
<td>1.79</td>
</tr>
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<td>Verbal Skill</td>
<td>238</td>
<td>6.01</td>
<td>2.26</td>
</tr>
<tr>
<td>Verbal Reasoning</td>
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<td>5.13</td>
<td>1.85</td>
</tr>
<tr>
<td>Numerical Ability</td>
<td>238</td>
<td>5.94</td>
<td>2.00</td>
</tr>
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<td>238</td>
<td>5.57</td>
<td>1.98</td>
</tr>
<tr>
<td>Energy Level</td>
<td>238</td>
<td>5.49</td>
<td>1.76</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>238</td>
<td>5.62</td>
<td>1.59</td>
</tr>
<tr>
<td>Sociability</td>
<td>238</td>
<td>6.88</td>
<td>2.23</td>
</tr>
<tr>
<td>Manageability</td>
<td>238</td>
<td>5.60</td>
<td>1.79</td>
</tr>
<tr>
<td>Attitude</td>
<td>238</td>
<td>5.79</td>
<td>1.92</td>
</tr>
<tr>
<td>Decisiveness</td>
<td>238</td>
<td>5.86</td>
<td>1.93</td>
</tr>
<tr>
<td>Accommodating</td>
<td>238</td>
<td>5.40</td>
<td>1.96</td>
</tr>
<tr>
<td>Independence</td>
<td>238</td>
<td>4.95</td>
<td>1.87</td>
</tr>
<tr>
<td>Objective Judgment</td>
<td>238</td>
<td>5.65</td>
<td>2.08</td>
</tr>
</tbody>
</table>
Table 6

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

**Correlation is significant at the 0.01 level (2-tailed).
Table 7

Regression Model Coefficients Independence Scale

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>60.581</td>
<td>7.826</td>
<td></td>
<td>7.741</td>
</tr>
<tr>
<td>Independence</td>
<td>6.331</td>
<td>1.480</td>
<td>.268</td>
<td>4.276</td>
</tr>
</tbody>
</table>

Table 8

Beta coefficient and significant level for regression equation using Stepwise

<table>
<thead>
<tr>
<th>Model</th>
<th>Beta In</th>
<th>Sig.</th>
<th>Partial Correlation</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Index</td>
<td>.008b</td>
<td>.899</td>
<td>.008</td>
<td>.997</td>
</tr>
<tr>
<td>Verbal Skill</td>
<td>-.026b</td>
<td>.681</td>
<td>-.027</td>
<td>.997</td>
</tr>
<tr>
<td>Verbal Reasoning</td>
<td>-.050b</td>
<td>.431</td>
<td>-.051</td>
<td>.996</td>
</tr>
<tr>
<td>Numerical Ability</td>
<td>.071b</td>
<td>.260</td>
<td>.073</td>
<td>1.000</td>
</tr>
<tr>
<td>Numeric Reasoning</td>
<td>.024b</td>
<td>.702</td>
<td>.025</td>
<td>.997</td>
</tr>
<tr>
<td>Energy Level</td>
<td>.090b</td>
<td>.171</td>
<td>.089</td>
<td>.914</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>.096b</td>
<td>.127</td>
<td>.099</td>
<td>.988</td>
</tr>
<tr>
<td>Sociability</td>
<td>.073b</td>
<td>.267</td>
<td>.072</td>
<td>.922</td>
</tr>
<tr>
<td>Manageability</td>
<td>.077b</td>
<td>.308</td>
<td>.066</td>
<td>.698</td>
</tr>
<tr>
<td>Attitude</td>
<td>.040b</td>
<td>.547</td>
<td>.039</td>
<td>.907</td>
</tr>
<tr>
<td>Decisiveness</td>
<td>.066b</td>
<td>.292</td>
<td>.069</td>
<td>.993</td>
</tr>
<tr>
<td>Accommodating</td>
<td>.101b</td>
<td>.139</td>
<td>.096</td>
<td>.847</td>
</tr>
<tr>
<td>Objective</td>
<td>.016b</td>
<td>.800</td>
<td>.017</td>
<td>.935</td>
</tr>
<tr>
<td>Judgment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 9

**Distribution of Top Motivational Characteristics**

<table>
<thead>
<tr>
<th>Motivation</th>
<th>N = 230</th>
<th>Selected Motivation</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>35</td>
<td>96.69</td>
<td>50.42</td>
</tr>
<tr>
<td>Selected</td>
<td>195</td>
<td>105.10</td>
<td>45.65</td>
</tr>
<tr>
<td>Technical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>166</td>
<td>110.41</td>
<td>46.14</td>
</tr>
<tr>
<td>Selected</td>
<td>64</td>
<td>86.74</td>
<td>42.85</td>
</tr>
<tr>
<td>People Service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>127</td>
<td>102.26</td>
<td>46.22</td>
</tr>
<tr>
<td>Selected</td>
<td>127</td>
<td>105.08</td>
<td>46.67</td>
</tr>
<tr>
<td>Creative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>188</td>
<td>101.16</td>
<td>44.75</td>
</tr>
<tr>
<td>Selected</td>
<td>42</td>
<td>115.76</td>
<td>52.04</td>
</tr>
<tr>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>133</td>
<td>106.02</td>
<td>42.32</td>
</tr>
<tr>
<td>Selected</td>
<td>97</td>
<td>100.80</td>
<td>51.52</td>
</tr>
<tr>
<td>Enterprising</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Selected</td>
<td>64</td>
<td>98.26</td>
<td>54.61</td>
</tr>
<tr>
<td>Selected</td>
<td>166</td>
<td>105.97</td>
<td>42.79</td>
</tr>
</tbody>
</table>

**ANOVA of Percent Sales Quota Achieved by Motivation Domain Selected**

<table>
<thead>
<tr>
<th>Motivation</th>
<th>N</th>
<th>Mean of 3-year % of Sales Quota</th>
<th>Standard Deviation</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td></td>
<td></td>
<td></td>
<td>.975</td>
<td>.324</td>
</tr>
<tr>
<td>Not Selected</td>
<td>35</td>
<td>96.69</td>
<td>50.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected</td>
<td>195</td>
<td>105.10</td>
<td>45.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td></td>
<td></td>
<td></td>
<td>12.63</td>
<td>.000</td>
</tr>
<tr>
<td>Not Selected</td>
<td>166</td>
<td>110.41</td>
<td>46.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected</td>
<td>64</td>
<td>86.74</td>
<td>42.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People Service</td>
<td></td>
<td></td>
<td></td>
<td>.210</td>
<td>.647</td>
</tr>
<tr>
<td>Not Selected</td>
<td>103</td>
<td>102.26</td>
<td>46.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected</td>
<td>127</td>
<td>105.08</td>
<td>46.67</td>
<td></td>
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</tr>
<tr>
<td>Creative</td>
<td></td>
<td></td>
<td></td>
<td>3.44</td>
<td>.065</td>
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<tr>
<td>Not Selected</td>
<td>188</td>
<td>101.16</td>
<td>44.75</td>
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<td>42</td>
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<td>52.04</td>
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<tr>
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<td>106.02</td>
<td>42.32</td>
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<tr>
<td>Selected</td>
<td>97</td>
<td>100.80</td>
<td>51.52</td>
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<td></td>
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<td>54.61</td>
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</tr>
<tr>
<td>Selected</td>
<td>166</td>
<td>105.97</td>
<td>42.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>