PERSONAL INNOVATIVENESS BASED SELF-ESTEEM: ESTABLISHING CONSTRUCT AND PREDICTIVE VALIDITY

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By

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ABSTRACT

PERSONAL INNOVATIVENESS BASED SELF-ESTEEM: ESTABLISHING CONSTRUCT AND PREDICTIVE VALIDITY

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The most crucial element of new construct development process is the external phase that needs to be executed in order to achieve a fully functional psychological construct. The external phase of new construct development includes development of nomological network to demonstrate construct's theoretical validity, predictive validity, or other criterion-related validities. To achieve this objective, this research, therefore, aims to validate a newly proposed innovativeness based psychological construct titled "innovativeness based self-esteem" (IBSE) which is confined within self-concept paradigm. To validate this construct, a three-step approach has been devised. First, the study developed a nomological network resulting in a set of hypotheses directing efforts to validate the construct empirically in organizational settings. Second, the theory of interactionism was tested for innovativeness based self-esteem (IBSE). Third, the test of predictive validity for innovativeness based self-esteem (IBSE) was conducted. Survey research design was adopted for this study due to its versatility because scholars argued that survey design is typically most suitable design, therefore, widely adopted by construct validation studies. To validate innovativeness based self-esteem construct, standard self-rated and supervisor-rated online questionnaires were administered to 150 permanent employees (technologists, engineers,

researchers) and their supervisors working in Research and Development (R&D) departments of Science and Technology (S&T) organizations of Pakistan at Time 1. A second sample was taken from same employees at Time 2 i.e., after 3 months. The second sample was only required to establish an evidence of test-retest reliability of innovativeness based self-esteem (IBSE). The study tested the hypotheses by applying Pearson product moment correlations, hierarchical linear regression, and Preacher and Hayes moderation analysis. Overall study results proved that innovativeness based self-esteem (IBSE) is a theoretically valid construct and stable over time. At last, all the results were discussed in the light of underpinned theories and reviewed literature along with proper justifications. No doubt, theorizing the innovativeness based self-esteem (IBSE) not only offers implications for self-concept theory, self-esteem theory, and personal innovativeness theory but also recommends that managers should consider extent of innovativeness based self-esteem (IBSE) of their workforce, along with other dispositional factors, in order to achieve desired innovative job performance outcomes.

APPROVAL SHEET

This dissertation/thesis entitled **"PERSONAL INNOVATIVENESS BASED SELF-ESTEEM: ESTABLISHING CONSTRUCT AND PREDICTIVE VALIDITY"** was prepared by MAHMOOD ANWAR and submitted as partial fulfillment of the requirements for the Doctor of Philosophy in Management at Universiti Tunku Abdul Rahman.

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DECLARATION

I hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

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LIST OF ABBREVIATIONS

JV-OBSE	Japanese Version of Organization Based Self-Esteem
OBSE	Organization Based Self-Esteem
SDT	Self-Determination Theory
DWBI	Danish Well Being Index
G-SISE	German Single-Item Self-Esteem scale
LGO	Learning Goal Orientation
JDS	Job Diagnostic Survey
IBSE	Innovativeness Based Self-esteem Scale
JA	Job Autonomy
PI	Personal Innovativeness
KAI	Kirton's Adaption-Innovation Inventory
ACL	Adjective Check List
RSS	Rosenberg Self-esteem Scale

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The aim of this research study is to validate personal innovativeness based self-esteem (IBSE) which is a newly proposed psychological construct confined within self-concept paradigm . This chapter presents the study background, problem statement, research objectives, and research questions. In addition, this chapter also highlights the contribution, significance, and scope of the study. At last, organization of the study is provided followed by definitions of key terms, and conclusion. It is worthwhile to mention that the problem statement not only focuses on the question related to key construct validation but also enlightens the management question that formerly led to the development of innovativeness based self-esteem construct. Further, innovativeness based self-esteem construct will be validated by testing employees serving in research and development (R&D) departments of science and technology (S&T) organizations of Pakistan, encouraging innovative outcomes.

1.2 Background of the Study

Personal innovativeness has been examined extensively in the literature of organizational behaviour (e.g., Roehrich, 2004; Sari, William, & Tina; 2018; Svendsen, Johnsen, Almås-Sørense, & Vittersø, 2013) because it

plays a pivotal role in attaining superior organizational performance (Rajapathirana & Hui, 2018; Sözbilir, 2018). No matter innovative product developers or users are considered, both are required to be high in personal innovativeness in order to develop or adopt an innovative product. Literature shows that personal innovativeness plays an important role to shape behavioural intentions of individuals which in turn determines the new product use behaviour (Alkawsi, Ali, & Baashar, 2021). Nowadays when conglomerates are encountering intense competition, it has become indispensable for firms to hire and maintain staff by implementing efficacious strategies to acquire sustainable competitive advantage (Walumbwa, Muchiri, Misati, Wu, & Meiliani, 2018). Literature signifies that several elements (e.g., financial, human, structural, procedural, technical, legal, economic, social) contribute to determine organizational success (Aerts, Grage, Dooms, & Haezendonck, 2014; Pourhanifeh & Mazdeh, 2016). Moreover, earlier research studies particularly focused on the importance of human resource which is deemed as a decisive constituent for businesses to get edge over rivals (Korzilius, Bücker, & Sophie, 2017).

Riaz, Xu, and Hussain (2018) reported that presently businesses are depositing extra efforts to study innovative behaviour of human resource in order to achieve and sustain superior performance as compared to rivals. Previous literature shows that innovation researchers, for instance, Farid, Hakimian, and Ismail (2017) and Grant (2000), have called to extend research on innovative behaviour of workforce because innovative outcomes ameliorate the overall productivity of organizations. Research disclosed that

approximately 80 percent of the innovative notions in organizations are instituted by personnel (Getz & Robinson, 2003). Regrettably, personnel are rarely fortified by business owners for their innovative contributions or overtly compensated for innovative comportment (De Spiegelaere, Van Gyes, & Van Hootegem, 2014; George & Brief, 1992). Surprisingly, studies report that organizational management considers individual innovative behaviour either as a discretionary behaviour or extra role behaviour (Katz & Kahn, 1978; Qi, Liu, Wei, & Hu, 2019).

Farid and his fellows (2017) pointed out that a significant quantity of research studies examining employee innovative behaviour were conducted at the organization level (e.g., Mendoza, 2015; Schultz, Sjøvold, & André, 2017). They recommended to dedicate more studies at individual level to investigate employee's innovative behaviour in organizations. For instance, Farid and his colleagues (2017) studied a sample taken from Malaysian organizations to investigate the impact of six types of leader-oriented behaviours on employee innovative behaviour. To study link between personality and innovativeness, Ali (2019) recced the influence of Big Five personality dimensions on employee personal innovative capabilities by drawing sample from Pakistani postgraduate university students. The researcher found positive relationship of extraversion, openness to experience, conscientiousness, and agreeableness with personal innovativeness. However, neuroticism was negatively related to personal innovativeness. Likewise, Støren (2016) pointed out antecedent factors adding variance to promote personal innovativeness by exploring the employees serving in various

countries i.e., Norway, The Netherlands, Finland, and Kingdom of Denmark. Thus, literature demonstrates that organizational researchers have investigated employee personal innovativeness at different units of analysis i.e., individual, team, and organizational level (Parzefall, Seeck, & Leppänen, 2008), organizational characteristics (Narayanan & Hosseini, 2014), employee innovative work behaviour (Riaz et al., 2018), coaching and learning (Støren, 2016) etc.

However, studies exploring personal innovativeness of employees by juxtaposing self-concept can rarely be found (Anwar et al, 2020). In addition, a handful of studies have explored relationship between employee personal innovativeness and self-concept in organizational settings. Self-concept has been systematically researched by personality psychology and organizational psychoanalysts, educational canvassers, and sociologists for over past hundred years (Crocker, 2002, Onetti, Fernández-García, & Castillo-Rodríguez, 2019; Wylie, 1979). Self-concept greatly influences the cognition, behaviour, and emotions of homo sapiens (Onetti et al., 2019). Self-concept and its one component i.e., self-esteem (Klein, Fröhlich, & Emrich, 2017) are crucial constructs being studied in clinical, personal, developmental, and social psychology (Greenier, Kernis, & Waschull, 1995; Marsh et al., 2019) . Organizational psychology research empirically proved that employees with positive self-concept or high level of self-esteem enjoy better mental health and adaptive functioning as compared to employees with negative self-concept or low level of self-esteem. Besides, Marsh and his colleagues (2019) reported that the self-concept is extensively explored and acknowledged theoretical

manifestation of an individual's optimistic view about self. For instance, McNeill (2018) found that women with better self-concept are most likely to act innovatively in exhibiting independence in fashion and style.

Literature establishes that self-esteem, an element of self-concept of individuals (Klein et al., 2017), acts as an important motivating factor for people to turn out to be innovative. To investigate the link between employee innovativeness and their self-esteem, Goldsmith and Matherly (1987) assessed the correlation between Kirton's adaption-innovation inventory (KAI) and Rosenberg self-esteem scale (RSS). The researchers compared personal innovativeness of employees with their self-esteem and observed that employees high in personal innovativeness are probable to manifest high degree of self-esteem. They found similar results when replaced Kirton's adaption-innovation inventory (KAI) with 12 items adopted from the adjective check list (ACL) tapping innovativeness of employees. Likewise, Keller (2012) realised that innovative outcomes of employees are significantly determined by self-esteem, while Maden and Koker (2013) empirically discovered that consumers' self-esteem remarkably affects their innovative outcomes. It is apparent from literature that little effort has been made to analyse the associational relation between employee personal innovativeness and self-esteem. Moreover, academic studies examining the underlaying mechanism driving the significant positive bidirectional link between personal innovativeness of workforce and self-esteem are also scarce in literature (Anwar, 2020).

The million-dollar proverb by Mr. White “If a problem is not biological in origin, then it will almost always be traceable to poor self-esteem” (Neil, 2015. p. 99), channelled and propelled the prober of this research to examine employees’ personal innovativeness by joining it to self-esteem. Contemporary organizational scholars have focused and explored employees’ innovative behaviour since it is considered as indispensable factor to augment the efficiency and effectiveness of firms (Grant, 2000; Riaz et al., 2018). The nature of association between employee personal innovativeness and their self-esteem has been seldom explored in former literature. For instance, a subjective study conducted by Schutz (1994) indicated that overall creativity, employee motivation, and workforce productive behaviour in organizations stem from self-esteem. Scholars also classified the employees participating in creative decision making in their organizations based on their level of self-esteem (Sternberg & O'Hara, 1998). Relatedly, Mason (2001) remarked that employees scoring high on self-esteem scale reflect eagerness to undertake neoteric challenging work assignments, are innovative, and more confident in comparison to employees scoring low on self-esteem scale.

Above mentioned evidences highlight significance of integrating employee personal innovativeness with self-esteem and pave the way to investigate employee personal innovativeness within self-concept boundary. After conducting the substantive phase of new psychological construct development process, the researcher propositioned a psychological construct reflecting that innovative individual may assess their personal innovative competences to ascertain their worthiness, successfulness, and significance in

their employing corporations. The researcher of present thesis deems that presenting personal innovativeness within self-concept theory could improve contemporary knowledge on "how innovative persons evaluate their innovative capabilities and how this positive evaluation furthers individual's performance results?" Therefore, present study attempts to validate this newly ascertained psychological construct named "innovativeness based self-esteem" (IBSE) which lies under the umbrella of self-concept.

Before proceeding further, it is important to scratchily mention the process of new psychological construct development and validation in study background because current understanding to this subject is limited. In addition, literature lacks to offer formal procedures solemnizing new psychological construct development process which makes it challenging. The Standards of Educational and Psychological Testing (2014), formalized by American Psychological Association (APA), in association with National Council on Measurement in Education (NCME), and American Educational Research Association (AERA), serve as reference to the best practices and methodologies for new psychological construct development.

The standards outline new construct development process into three phases i.e., substantive, structural, and external. The substantive phase includes definition, theoretical support for development of new construct, and content requirement to measure it. The structural phase embraces the psychometric properties of the measure like principal component or axis analysis, internal consistency, and test-retest reliability. Finally, the external

phase includes development of nomological network to demonstrate construct's theoretical validity, predictive validity, or other criterion-related validities (Flake, Pek, & Hehman, 2017). Flake et al. (2017) further described that the process of new construct development starts with recognising a construct, delineating it, finding theoretical support for it, selecting the means to measure it, and testing whether measure is appropriately reflecting the actual construct. Due to the tortuous nature of this subject, Sirois and Pychyl (2016) realized that new construct development and validation is a time taking process and may require distinct multiple studies over different time spans to independently conduct these three phases, *ergo*, a fully functional construct can be offered.

Innovativeness based self-esteem (IBSE) construct was conceived by the researcher of present thesis in early 2017. In the substantive phase, the construct was identified by analysing a theoretical gap in the research work of Goldsmith and Matherly (1987). The intellectuals conducted correlation analysis to test association among Kirton's adaption-innovation inventory (KAI), 12 items tapping innovative abilities of individuals adopted from adjective check list (ACL), and Rosenberg self-esteem scale (RSS). These scholars spotted that individuals high in personal innovativeness presumably exhibit high self-esteem. Hitherto "why this relationship between personal innovativeness and self-esteem exists" is an enigma which needs further attention (for details please see Appendix-I). In addition, former studies conducted by the researcher of present thesis and his colleagues, exploring personality, learning goal orientation, and individual creativity, also provided

helpful insights to conceptualize this construct (Anwar, 2017; Zhang, Ji, Anwar, Li, & Fu, 2020).

After conducting a literature review, researcher noted that rational to the development of innovativeness based self-esteem (IBSE) can be supported by applying self-concept and self-esteem theories (Coopersmith, 1967; Rosenberg, 1976). Therefore, following new instrument development directions as suggested by Hinkin, Tracey, and Enz (1997), the researcher developed a definition of innovativeness based self-esteem (IBSE) by prudently considering the available literature on employee personal innovativeness (e.g., Agarwal & Prasad, 1998; Leavitt & Walton, 1975, 1988; Rogers, 2003), and self-esteem (e.g., Coopersmith, 1967; Rosenberg, 1965). Thenceforth, a panel of experts was formed to refine the definition of innovativeness based self-esteem (IBSE) and items to measure it. At this point the substantive phase was completed.

The structural phase incorporates the psychometrics requirement to measure a construct, for instance, principal component or axis analysis, internal consistency of instrument, and test-retest reliability (Flake et al., 2017). Due to the fact that principal component or axis analysis element of structural phase is closely associated to items generation component of substantive phase, it was decided to conduct the principal component analysis by following the directions provided by Tierney and Farmer (2002). This laborious task was completed with the operational and financial support of a US based research and networking organization.

After completing substantive phase fully, and structural phase partially, the next task is to address remaining methodological part of structural phase i.e., internal consistency, test-retest reliability, and complete external phase i.e., development of nomological network to demonstrate construct's theoretical validity, predictive validity, or other criterion-related validities. This task will be accomplished in the present study. This study will achieve the stated task by establishing an evidence of theoretical construct validity, predictive validity, reliability, and stability of innovativeness based self-esteem (IBSE). In addition, theory of interactionism will also be tested for innovativeness based self-esteem (IBSE). It is worth mentioning that this study applies ontological processes instead of prototypical epistemological processes to conduct the external phase of psychological construct development process.

1.3 Problem Statement

This "*a priori*" theoretical inquiry endeavours to validate the "innovativeness based self-esteem" (IBSE) construct in organizational settings (all studies dealing with new constructs, theory development, and ontological processes are *a priori*). Before explaining the problem related to construct validation this thesis is going to address, it is worthwhile to present previously identified theoretical gap in literature (during substantive phase) guided to the development of main research question and further development of "innovativeness based self-esteem" (IBSE) during substantive phase. To formulate the main management question (Cooper & Schindler, 2011), this

study applied knowledge void method as suggested by Jacobs (2013). For this purpose, the author of present study spotted that Goldsmith and Matherly (1987) examined the relationships among Kirton's adaption-innovation inventory (KAI), items from adjective check list (ACL) capturing individual innovativeness, and Rosenberg's self-esteem scale (RSS). They discovered that individuals high in personal innovativeness are expected to exhibit greater self-esteem as compared to individuals having lower levels of self-esteem, though, they did not extend their study to answer an important research question "why innovative people reflect high self-esteem?" Similarly, Schutz (1994) proclaimed that the key source of creative behaviour, work enthusiasm, and productive outcomes of workforce is positive self-esteem.

These reported studies, though, laid the foundation to advance this research line. In addition, to the best of our knowledge, literature ascertains that none of the prior studies construed employee individual innovativeness within the self-concept theoretical boundary and coupled it with self-esteem with the aim to stipulate innovativeness specific self-esteem (Anwar, 2020; Anwar et al., 2020). Hence, following integrated construct development approach, both literature on theory of self-esteem and personal innovativeness is considered to propose an *a priori* psychological construct i.e., innovativeness based self-esteem manifesting individual's evaluations about self concerning his personal innovative capacities.

Since the importance of self-concept and self-esteem is convincing for human behaviour (Crocker, 2002, Onetti, Fernández-García, & Castillo-

Rodríguez, 2019), and personal innovativeness (Shoham, Gavish, & Segev, 2015), it would be important to validate the innovativeness based self-esteem (IBSE) construct in organizational settings to explore its implications. Therefore, present study concentrates on the research question "Is innovativeness based self-esteem (IBSE) a valid psychological construct?" Literature suggests that a newly proposed psychological construct should display theoretical construct validity because the influences of measurement errors on theoretical associations among numerous constructs would be difficult to explain if the construct does not exhibit theoretical validity (Mohajan, 2017).

Research in personality psychology also suggests that antecedents to a psychological construct based on trait theory should satiate interactionist perspective (Kakkar, Tangirala, Srivastava, & Kamdar, 2016; McCormick, Guay, Colbert, & Stewart, 2019; Shen, Chick, & Zinn, 2014) (theory of interactionism is also known as interactionist perspective, person-situation interaction, interactionist view, doctrine of interactionism). The interactionism theory posits that the human behaviour is shaped by the interaction of traits and states, and none of the factors can cause the individual behaviour alone (Mosley & Laborde, 2016). McCormick et al. (2019) mentioned that because contextual variables shape the individual behaviour of employees, it is necessary to test the interaction of contextual variables with personal variables to determine the influence of interaction on outcome. Therefore, it is a standard practice adopted by personality researchers to test theory of interactionism for new personality related constructs.

Mohajan (2017) signified the importance to test the predictive validity of new constructs because it predicts certain type of behaviour. To validate a new psychological construct, Rossiter (2002) suggested to test construct validity (nomological validity), predictive validity, and test-retest reliability. It is evident that Tierney and Farmer (2002) validated their creativity related construct by applying techniques like nomological network, predictive validity test and testing the theory of interactionism. Similarly, Matsuda et al. (2011) established an evidence of construct validity for their Japanese version of organization based self-esteem (JV-OBSE) construct by developing nomological network and testing predictive validity. Following alike method, this academic study constructed a nomological network to examine theoretical validity of the proposed construct, as well as conducting test of the interactionist theory, and theory of predictive validity for innovativeness based self-esteem (IBSE). Furthermore, the stability of innovativeness based self-esteem (IBSE) will also be explored.

The researcher believes that innovativeness based self-esteem (IBSE) construct will offer an invaluable contribution to the self-concept conjectural paradigm as individual's evaluations about himself concerning his personal innovative capacities can settle the paradox "why innovative people reflect high self-esteem?" Literature suggests that nice levels of self-concept and self-esteem are necessary for employees' mental health and productive functioning (Chan & Lee, 1993), positive self-beliefs (Marsh et al., 2019), personal innovativeness (Shoham et al., 2015), employee job performance (Alkhamis, 2018; Kim, Jeoung, & Park, 2019), and employee innovative performance

(Pradhan & Jena, 2017; Standing et al., 2016). It is apparent that contemporary organizational researchers are endeavouring to find solution to problems pertaining to employee performance. Therefore, having insights about employee's evaluations about their innovative capabilities is likely to enhance the understanding of employee motivation to innovate and innovative outcomes.

1.4 Research Objectives

The objectives of this study are:

1. To identify the antecedents (nomologicals) to the innovativeness based self-esteem. (External phase).
2. To establish construct validity of innovativeness based self-esteem. (External phase).
3. To test theory of interactionism for innovativeness based self-esteem. (External phase).
4. To test the predictive validity of innovativeness based self-esteem. (External phase).
5. To establish test-retest reliability of innovativeness based self-esteem. (Structural phase).

1.5 Research Questions

The following are the research questions for this study:

1. What are the potential antecedents (nomologicals) to innovativeness based self-esteem? (External phase).
2. Is innovativeness based self-esteem a valid construct within a nomological framework? (External phase).
3. Will the relationship between personal factor (learning goal orientation) and innovativeness based self-esteem be influenced by contextual factor (job autonomy) to satisfy theory of interactionism? (External phase).
4. Does innovativeness based self-esteem achieve a good predictive validity? (External phase).
5. Is innovativeness based self-esteem scale stable over time? (Structural phase).

1.6 Significance of the Study

The objective of present research is to proffer contribution to the theory of self-concept (self-esteem) and empirically examine the reflection of innovativeness based self-esteem (IBSE) in the sample of individuals working on innovation oriented tasks. Taxonomic literature establishes that all the studies dealing with new constructs, in any capacity, per se stand top among other types of studies in terms of theoretical contribution (Svejvig, 2021). The present study seeks to identify potential antecedents (nomologicals) to innovativeness based self-esteem (IBSE) to develop a nomological network so that an evidence of construct validity can be established (Cronbach & Meehl, 1955; Hoffman, Kennedy, LoPilato,

Monahan, & Lance, 2015; Kakkar et al., 2016). The study contributes to the literature in many novel ways as mentioned below.

1.6.1 Theoretical Contribution

This study clearly contributes to self-concept, self-esteem, and personal innovativeness theories by validating a newly proposed psychological construct innovativeness based self-esteem (IBSE) construed within self-concept theory. Current study establishes an evidence of construct validity by employing nomological network technique (Cronbach & Meehl, 1955) because theory of construct validity heavily depends on the development of a nomological network. This theoretical network serves two key purposes. Firstly, it helps to understand and delineate psychological constructs analogous to positivists approach to define theoretical concepts. Secondly, it provides an evidence of theoretical construct validity, which is achieved through the accord between the nomological relationships and empirical data (Borsboom, Mellenbergh, & van Heerden, 2004). An agreement between proposed theoretical relationships and empirical relationships is key to achieve a theoretically valid psychological construct. Additionally, the nomological network is unique per se because it constitutes a theory (Cronbach & Meehl, 1955) and provides *a priori* arrangement of constructs that furnishes theory building for *a priori* psychological constructs (Alotaibi, 2012).

The study also tests theory of interactionism for innovativeness based self-esteem (IBSE). Theory of interactionism provides a theoretical framework

to investigate the influence of contextual factors that interact the personal factors to determine the behaviour (McCormick et al., 2019). Therefore, it will be tested empirically whether personal and contextual factors impact innovativeness based self-esteem (IBSE) or not.

In addition to theoretical validity, predictive validity (a type a criterion related validity) of innovativeness based self-esteem (IBSE) will be established. Innovative job performance will be used as criterion (Niessen, Meijer, & Tendeiro, 2018) in order to test whether it is predicted by innovativeness based self-esteem (IBSE). Furthermore, stability of innovativeness based self-esteem (IBSE) will also be tested. The successful validation of innovativeness based self-esteem (IBSE) will extend Goldsmith and Matherly's (1987) theoretical framework by submitting that people high in innovative abilities are more probable to exhibit high self-esteem because they may manifest an extent of innovativeness based self-esteem (IBSE).

1.6.2 Practical Contribution

Introducing personal innovativeness specific self-esteem will undoubtedly augment current realization on "how individuals high in personal innovativeness appraise themselves and how this positive evaluation enhances individual's performance outcomes?" All organizations requiring innovative outcomes (e.g., scientific, research, and development) can outpace if managers envisage innovativeness based self-esteem (IBSE) of employees along with other dispositional factors. People with high self-esteem and desire to become

respected in society can be more innovative in comparison with people scaled low at self-esteem (Anwar, 2020; Baumeister, Campbell, Krueger, & Vohs, 2003). In a study conducted by Anwar (2017), the author postulated that creativity and innovation oriented tasks could be assigned to employees unveil strong creative self-efficacy to get optimal efficiency. Conversely, present study positioned that employees high in innovativeness based self-esteem (IBSE) can perform best when it comes to innovative work assignments.

1.6.3 Methodological Contribution

The development of nomological network technique (Cronbach & Meehl, 1955) is the only established method available in literature to assess theoretical validity of new or extended constructs. It not only provides theory building for *a priori* constructs but also provides a framework to link theoretical and empirical realms (Ralph & Tempero, 2018). In addition, application of ontological processes to develop nomological network instead of prototypical epistemological processes is also a significant methodological contribution because it eliminates potential frailties of the nomological network. It is also worth mentioning that conducting *a priori* studies is innately challenging as compared to regular studies.

1.7 Scope of the Study

Present research aims to establish an evidence of construct validity, test interactionist perspective, and theory of predictive validity

for innovativeness based self-esteem (IBSE) in organizational settings. To achieve this objective, surveys will be distributed to 150 full-time regular employees (i.e., engineers, technologists, research professionals) and their supervisors working in research and development (R&D) departments of science and technology (S&T) organizations of Pakistan. This is clearly aligned with the definition of "sampling elements" as mentioned by Lavrakas (2011, p. 52):

"The elements used in different surveys will depend on the purpose of the survey and may be adults, children, households, **e**mployees, businesses, students, teachers, schools, school districts, uniformed personnel, civilian personnel, police districts, libraries, books within libraries, pages within books, or many other things".

Thus, employees working on various innovative work assignments in research and development (R&D) departments of science and technology (S&T) organizations of Pakistan are considered as sampling elements for the present study.

Amabile (1996) affirmed that innovation is crucial to all organizations and jobs up to certain extent. However, Siyanbola, Isola, Egbetokun, and Adelowo (2011, p.20) mentioned that:

"Science and Technology (S&T) creates new knowledge; and knowledge is self-replicating as the more people have access to knowledge the

more knowledge is produced. Most countries now devote an increasing proportion of their resources to science and technology (S&T) and associated research and development (R&D) in an attempt to build competitive advantage".

Siyanbola et al. (2011) also linked R&D and its profitability with degree of its innovativeness. Similarly, Daniels, Tregaskis, and Seaton (2007) proxied innovation with R&D activities in technical organizations. Since the present study is related to innovativeness, the researcher kept in mind the stance of Siyanbola et al. (2011), and Daniels et al. (2007). Based on the importance of R&D departments of S&T organizations, it is decided to validate innovativeness based self-esteem (IBSE) by selecting the employees working in research and development (R&D) departments of Science and Technology (S&T) organizations in Pakistan.

Although this study is limited in scope by sample size, geographic area, and time, literature shows an agreement of research scholars that after a trait or psychological construct is validated, it can be adopted by other studies for testing and application purposes. For instance, Agarwal and Prasad (1998) validated "personal innovativeness in information technology" construct by collecting sample from 175 employees working in United States based technology organizations. Similarly, Robertson (2013) established nomological construct validity for "virtual team citizenship behaviour" by testing 107 professionals working in various organizations in United States. These constructs are fully adoptable and available to academic researchers

worldwide for their studies. Similarly, after successful validation of innovativeness based self-esteem (IBSE), the construct will be available to personality and organizational researchers for adoption and application.

1.8 Definitions of Key Terms

Self-Concept

Self-concept is defined as "the totality of an individual's thoughts and feelings having reference to him/herself as an object" (Rosenberg, 1976, p.7). In the present study, a newly proposed construct innovativeness based self-esteem (IBSE) is confined within self-concept paradigm.

Self-Esteem

Self-esteem is delineated as "the extent to which the individual believes himself to be capable, significant, successful and worthy" (Coopersmith, 1967, p. 4). Present study considered self-esteem in the context of personal innovative capabilities, as an individual's evaluations about his/her personal innovativeness.

Personal Innovativeness

"A person who is open to new experiences and often goes out of their way to experience different and novel stimuli, particularly of a meaningful sort" (Leavitt & Walton, 1975, p. 546). This research considers personal innovativeness as a correlate of innovativeness based self-esteem (IBSE) and a nomological to innovativeness based self-esteem.

Personal Innovativeness based Self Esteem

"The extent to which individuals feel pride and worthiness in their incremental and/or radical innovative capabilities" (Anwar, 2020, p. 139; Anwar, Maludin, & Lee 2020. p. 845). This is a new psychological construct present study attempts to validate.

Nomological Network

"Interlocking system of laws which constitutes a theory" (Cronbach & Meehl, 1955, p. 290). Preckel and Brunner (2017, p. 1) mentioned that Cronbach and Meehl introduced the idea of construct validity to validate theoretical attributes or qualities (i.e., constructs) for which there is no adequate criterion or which cannot be defined operationally, for example, personality traits or intelligence. This study develops a nomological network to confirm that innovativeness based self-esteem (IBSE) is a theoretically valid construct.

Nomologicals

The terminology for antecedents in the context of nomological network is nomologicals (Cronbach & Meehl, 1955). This study has proposed four nomologicals to innovativeness based self-esteem (IBSE). The terms antecedents and nomologicals are used interchangeably in this study.

Organization Based Self-esteem

"The degree to which an individual believes him/herself to be capable, significant, and worthy as an organizational member" (Pierce, Gardner, Cummings, & Dunham, 1989, p. 625). This research considers organization

based self-esteem (OBSE) as a domain specific nomological to innovativeness based self-esteem.

Learning Goal Orientation

Learning goal orientation refers to "orientations towards goals in which individuals are concerned with increasing their competence" (Dweck & Leggett, 1988, p. 256). This research considers learning goal orientation as a nomological to innovativeness based self-esteem (IBSE).

Job Autonomy

"The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling work and in determining the procedures to be used in carrying it out" (Hackman & Oldham, 1980, p. 79). This research considers job autonomy as a nomological to innovativeness based self-esteem (IBSE).

Innovative Job Performance

"Innovative job performance reflects employees' job performance in the context of innovative outcomes" (Rodrigues & Rebelo, 2019). Innovative job performance is used in present study to establish an evidence of predictive validity of innovativeness based self-esteem (IBSE) (Matthews et al., 2009; Niessen et al., 2018).

Theory of Interactionism

Theory of interactionism suggests that traits and situations interact together to affect behaviour (McCormick, Guay, Colbert, & Stewart, 2019). This research tested theory of interactionism for innovativeness based self-esteem (IBSE). Theory of interactionism is also called the doctrine of interactionism, person-situation interaction, the interactionist approach, and the interactionism perspective.

1.9 Organization of the Study

Chapter One – Introduction

This chapter briefly presents study background, problem, and contribution of this study. In addition, objectives, significance, scope, and definition of key terminologies are also provided.

Chapter Two – Literature Review

This chapter organizes an overview of related literature. It discusses the main constructs, underlying theories, concept of innovativeness based self-esteem (IBSE), stepwise approach to validate a construct, development of nomological network, theory of interactionism, predictive validity test, hypotheses development, and nomological network for innovativeness based self-esteem i.e., theoretical framework.

Chapter Three – Methodology

This chapter presents research paradigm, research process, population and sample, study design, data collection technique, sampling method, constructs'

operationalization, structure of questionnaires, pilot study, and analysis of data.

Chapter Four – Analysis and Results

This chapter reports data management, testing general linear model (GLM) assumptions, data analysis, reliability, test-retest reliability, and hypotheses testing. Finally, the conclusion summarizes the analyses comprehensively.

Chapter Five – Discussion and Conclusion

This chapter discusses the results pertaining to nomological network, theory of interactionism, predictive validity, and construct stability by linking each hypothesis to its corresponding research question. In addition, the results are justified in the light of theory applied to develop the hypotheses. Moreover, study implications, limitations, and future direction are presented. Finally, the chapter has been concluded.

1.10 Conclusion

This chapter provides an overview of the significance of innovative employees for organizations and how innovativeness of employees is vital to outperform. Literature shows that innovativeness of employees has been studied in various contexts but its exploration within self-concept paradigm can rarely be found. Present thesis aims to validate a new construct "innovativeness based self-esteem" (IBSE) which reflects self-evaluations of individuals about their personal innovativeness. This chapter presents study background, problem statement, and contribution of this study. In addition, objectives, significance, and scope of the study are also provided. For ease of

the readers, this chapter also provides an overview of different chapters of this study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on self-concept and self-esteem, personal innovativeness, their linkages, underlying theories adopted to select nomologicals, and definition of innovativeness based self-esteem (IBSE). These sections are related to substantive and partial external phase of new construct development process because definition of underlying constructs, concept of new construct, and theoretical support for development of new construct have been discussed in these sections. In addition, a stepwise approach to validate the psychological constructs has been devised by examining related studies either developed or extended psychological constructs. The present study creates a nomological network specific to personal innovativeness in order to determine an evidence of construct validity of innovativeness based self-esteem (IBSE). Lastly, the theory of interactionism is tested for innovativeness based self-esteem (IBSE) and way to establish predictive validity of innovativeness based self-esteem construct is also presented.

The researcher attempts to highlight theories that could rationalize the mechanism to the steps followed in validating innovativeness based self-esteem construct. These sections are related to external phase of new construct development process. It is worth nothing to mention that the remaining

elements of structural phase i.e., internal consistency, and test-retest reliability are methodological components, *ergo*, will be discussed in Chapter 3.

2.2 Introduction to Psychology

Aetiologically, the term psychology was formed by adjoining two Greek words “psyche” and “logos”. The meaning of Greek word “psyche” is breath, whereas the meaning of Greek word “logos” is word. Later, the word “psyche” was expanded in meaning to include mind, and word “logos” was extended to include science (Colman, 2015). Riggio (2013. p. 2) stated that “psychology is a scientific study of behaviour and mental processes”. According to Woodworth (2018), psychology is science of mind, consciousness, or behaviour. Moreover, Henriques (2001) mentioned that psychology is a heterogeneous federation of subdomains fragmented in multiple and smaller specialized areas. The areas under wide umbrella of psychology are either divided into varieties of psychology like differential psychology, applied psychology, and general psychology (Woodworth, 2018), or sub-disciplines like psychiatry, psychoanalysis, and psycho-philosophy (Colman, 2015). Colman (2015) expounded that applied psychology includes clinical, educational, industrial, organizational, and forensic psychology. In these sub-areas of applied psychology, the organizational psychology is a speciality area that probes human behaviour in organizations (Riggio, 2013). Gelfand, Aycan, Erez, and Leung (2017) explicated that organizational psychology and organizational behaviour has a long past but a short history. Most of the theories exploring work psychology of employees were developed

during the last century with the advent of *Journal of Applied Psychology* by American Psychological Association (APA) in 1917 (Gelfand et al., 2017).

The organizational psychology studies the behaviour of individuals at work, therefore, study of their self-concept, traits, and dispositional tendencies is crucial to organizational psychology. Lindeblad, Nilsson, Gustafson, and Svensson (2019) noted that self-concept is not a unitary notion and comprises of both self-descriptions and self-evaluations by an individual about abstract depiction of self and his worthiness. Self-concept entails three elements i.e., self-esteem, self-image, and ideal-self (Mishra, 2016). Self-concept and self-esteem are psychological concepts that have been extensively investigated in clinical, organizational, personality, developmental, and social psychology (Greenier et al., 1995, Marsh et al., 2019).

This study aims to validate a newly proposed psychological construct innovativeness based self-esteem (IBSE) which is confined within self-concept paradigm. The construct manifests individuals' self-evaluations regarding their innovative capabilities in organizational settings. This study lies under the parasol of organizational psychology which is a subdomain of applied psychology.

2.3 Self-Concept

For more than a hundred years, psychologists, academics, sociologists, and other researchers within organizations have examined the psychological

concept called self-concept. Hitherto, this psychological concept has not lost its popularity among personality, organizational, and clinical psychologists because theoretical and empirical literature present its momentous bearing on cognition and behaviour (Crocker, 2002, Onetti et al., 2019; Wylie, 1979). Oyserman, Elmore, and Smith (2012) reported that self-concept comprises of cognitive structures which include content-based, evaluative judgments or attitudes used to apprehend numerous perspectives, contexts, achievements of goals, and acknowledgement of self-worth. Carl Rogers introduced three elements of self-concept i.e., self-esteem, self-image, and ideal-self (Mishra, 2016). Self-concept and self-esteem are vital concepts studied in developmental, personality, clinical, and social psychology (Greenier et al., 1995, Marsh et al., 2019). Chan and Lee (1993) mentioned that a positive self-concept or ample self-esteem is essential to the mental health and adaptive functioning of individuals. Likewise, Marsh et al. (2019) signified that self-concept is the most widely accepted and adopted theoretical reflection of individual's positive self-beliefs.

According to Rosenberg (1976, p.7) self-concept is the totality of an individual's thoughts and feelings having reference to him/herself as an object, while Bailey (2003) cited that self-concept is a perception of an individual about his or her overall personality and attributes. Explicitly, the integrated beliefs or properties about how individuals perceive themselves is called self-concept. Self-concept is deep-rooted in academic, emotional and social abilities of persons. Moreover, literature reflects that self-concept of individuals is shaped when they associate themselves with these attributes

(Byrne, 1984). Likewise, Baumeister (1998) proclaims that person's awareness of self implies that he has clear self-concept. Self-categorization theory presented by Turner et al. (1979) also affirms that self-concept comprises of personal and social identity. Personal identity manifests individual dispositional characteristics and traits, whereas social identity signifies individual's belongingness to society, religious sermons, cultural groups, and communities (Mehrad, 2016). Present study focuses on self-esteem, which is an evaluative element of self-concept (Klein et al., 2017), because the proposed new construct, to be validated, reflects personal innovativeness specific evaluations about self, therefore, a specific type of self-esteem.

2.3.1 Self-Esteem

Literature indicates that self-esteem of individual is predominantly affected by his self-concept because, fundamentally, self-esteem is individual's view towards "self" (Heatherton and Wyland, 2003). Pagaduan-Apostol (2017) referred self-esteem to the view individuals have about themselves. It also reflects the assessment and evaluation of a person regarding his worth. In other words, self-esteem is an individual's evaluation regarding his self-concept or an evaluative wedge of self-concept (Sari, Bilek, & Çelik, 2018). Moreover, Individual's self-esteem is predisposed by his cognitive processing system, personality traits, characteristics etc. (Kernis, 2003). Literature of human psychology describes self-esteem as the degree of self-acceptance, self-worth, self-respect, and self-approval. Brockner (1988)

indicated that some people appraise their personal abilities or characteristics positively, while other may judge their abilities or characteristics negatively. Therefore, these differences determine level of self-esteem within individuals and these disparities resulting from individual assessment about self lead to differences in one's attitudes and behaviours. Moreover, Mc Leod (2012) viewed self-esteem as a gamut that can have high, medium, and low levels. He asserted that both extremely high or low levels of self-esteem can be detrimental for individuals in emotional and social contexts, therefore, an optimal level of self-esteem should be maintained. It is evident that people high on self-esteem scale focus on improvement and growth, while people low in self-esteem feel worthlessness and unsatisfied with self.

It is also important to mention the historic development of self-esteem construct. The concept of self-esteem was first proposed by James (1892). He defined self-esteem in terms of a mathematical formula. According to his view, self-esteem can be realised as a person's successes divided by his pretensions. He argued that self-esteem can be raised by increasing the success rate and evading the failure rate. If someone has achieved more successes than the pretensions, he will enjoy more self-esteem. In James' view, self-esteem is a competence-oriented concept and is always open to change.

The second important contribution to self-esteem concept was made by Rosenberg in 1965. He introduced the concept of individual worthiness into the definition of self-esteem. He affirmed that individuals judge themselves as good or bad. Hence, Rosenberg was the first psychologist who presented the

fact that self-esteem is evaluative in nature but self-concept is not (Rosenberg, 1965).

In the same line, Coopersmith (1967) further worked on this concept and determined potential antecedents to self-esteem. He added to the definition that self-esteem is essential to the self-awareness and personal identity. He also mentioned that self-esteem has levels like low or high. The levels of self-esteem affect individual's behaviour either positively or negatively. Previously, researchers like Alexander (2001), Branden (1969), Mruk (1999), and Smith-Lovin (1995) also attempted to define self-esteem; their definitions were also based on the concept of worthiness, self-appreciation, and individual experience. These definitions are provided in Table 2.1.

Table 2.1 Important Definitions of Self-Esteem in Literature

No.	Author	Definition
1	James (1892)	"Self-esteem is the sum of our successes divided by our pretensions (p. 311)".
2	Rosenberg (1965)	Self-esteem refers to "a person's overall positive evaluation to the self and judgment about worthiness (p. 16)".
3	Coopersmith (1967)	"The extent to which the individual believes himself to be capable, significant, successful and worthy (p. 4)".
4	Branden	"Self-esteem is the conviction that one is competent to

	(1969)	live and worthy of living (p. 110)".
5	Smith-Lovin (1995)	"Reflexive emotion that has developed over time in social processes of invention that individuals learn to experience and to talk about, that arises in predictable social circumstances, and that is subject to social control (p. 119)".
6	Mruk (1999)	"Self-esteem is the lived status of one's competence in dealing with the challenges of living in a worthy way over time (p. 26)".
7	Alexander (2001)	"Unconditional appreciation of oneself (p. 4)".

Source: Established for this research

Although James (1892) was the pioneer of self-esteem concept and his definition explicitly explicated this concept, nevertheless, due to its objective nature, personality psychologists attempted to explicate self-esteem subjectively. In the literature, the most significant definitions of self-esteem are considered as the definitions proposed by Rosenberg (1965), and Coopersmith (1967).

It is important to note that the above-mentioned researchers conceptualized self-esteem as a global construct having one dimension only. However, Marsh (1990) argued that it is a multidimensional construct consisting of dimensions that reflect multiple roles and experiences of individuals. Contrary to this view, unidimensional measurement of self-esteem

is popular nowadays among organizational and psychology researchers (García, Olmos, Matheu, & Carre, 2019; Rizwan, Malik, Malik, & Siddiqui, 2017). Literature also segregates self-esteem into its global component and domain specific facets. Von Soest, Wichstrøm, and Kvalem (2016) reported that global self-esteem is mostly abstracted as individual's overall evaluation of self and reflection of individual's beliefs about self-worth. Typically, global self-esteem is measured with unidimensional scale (i.e., Rosenberg, 1965) of which each item taps individual's general perceptions of self-worth. This scale does not include any domain specific content (Rentzsch & Schröder-Abé, 2018). Literature shows that researchers have meticulously developed global self-esteem concept over the past couple of decades, nonetheless, domain specific self-esteem is underdeveloped. Therefore, less is known about how domain specific self-esteem works in general and in the creativity and innovation contexts (Barbot, 2019; Harris, Wetzel, Robins, Donnellan, & Trzesniewski, 2018). Rentzsch and Schröder-Abé (2018) noted that hierarchical models of global self-esteem divide it into different domains at subordinate level, which is referred to as domain specific self-esteem. For instance, Shavelson, Hubner, and Stanton (1976) proposed four broad categories of domain specific self-esteem i.e., academic, social, emotional, and physical self-esteem. Likewise, Heatherton and Polivy (1991) theorised self-esteem as a hierarchical construct and divided it into three components i.e., performance, social, and physical self-esteem.

Gardner and Pierce (2015) extended the concept of domain specific self-esteem by testing self-esteem of teams working in computer hardware,

software and cellular phones manufacturing and developing organizations. They measured organization based self-esteem (OBSE) of employees which is defined as "the degree to which an individual believes him/herself to be capable, significant, and worthy as an organizational member" (Pierce et al., 1989, p. 625). Gardner and Pierce (2015) mentioned that Pierce et al. (1889) developed OBSE definition by adding an organizational context into Coopersmith's (1967) self-esteem definition. They further mentioned that OBSE is an individual's deep-rooted believe about worthiness in his organization. They found that OBSE is a significant predictor of team satisfaction and team members effectiveness. In the same vein, Norman, Gardner, and Pierce (2015) reported that OBSE is a domain-specific facet of self-esteem that reflects individual's evaluations about his self-worth within the job and organizational context. Based on the significance of OBSE, it is decided to include OBSE into the nomological network to establish an evidence of construct validity of innovativeness based self-esteem (IBSE).

2.4 Personal Innovativeness

In the fields of psychology, management, technology, and marketing, the notion of innovation is perceived differently. In the view of Rogers and Shoemaker (1971), innovativeness refers to the degree to which a person is relatively earlier in espousing an innovative product than other members of his community. Above definition shows that researchers' main focus was on adoption time. Therefore, Rogers and his colleague considered only those people as innovative who have the ability to adopt an innovative outcome

earlier than the other people of their circle. However, Midgley and Dowling (1978) indicated that Rogers and Shoemaker's (1971) approach lacks reliability and validity and does not allow comparisons among different studies. Similarly, Agarwal and Prasad (1998) criticized that the adoption time component of Rogers and Shoemaker's definition is not very significant concept and also narrow in scope. Further, Leavitt and Walton (1975) worked on this concept and delineated innovativeness as a personal characteristic. They argued that innovative persons are open to new experiences and often try to find out new ways to experience different and significant but unique inducements. Agarwal and Prasad (1998) conceptualized personal innovativeness in the domain of information technology. They observed personal innovativeness as the willingness of an individual to test newly developed products related to information technology. In the domain of marketing, Wu (2011) conducted a study to find association between customer satisfaction and electronic store loyalty. He asserted that personal innovativeness is related to consumer's attitude towards new notions and innovative decision making based on public experiences. Moreover, Sari et al. (2018) considered innovativeness as a personality trait which can be global or domain specific. The contribution of various researchers to the personal innovativeness definition is shown in Table 2.2 below.

Table 2.2 Noteworthy Definitions of Personal Innovativeness in Literature

No.	Author	Definition
1	Rogers & Shoemaker (1971)	"The degree to which an individual is relatively earlier in adopting an innovation than other members of his (social) system (p. 27)".
2	Leavitt & Walton (1975)	"A person who is open to new experiences and often goes out of their way to experience different and novel stimuli, particularly of a meaningful sort (p. 549)".
3	Kirton (1976)	"A basic dimension of personality relevant to the analysis of organizational change (p. 623)".
4	Hurt et al. (1977)	"A normally distributed, underlying personality construct, which may be interpreted as a willingness to change (p. 59)".
5	Agarwal & Prasad (1998)	"The willingness of an individual to try out any new information technology" (p. 206).
6	Rogers (2003)	"The degree to which an individual or other unit of adoption is relatively earlier than other members of a system" (p. 22).

Source: Established for this research

Although many scholars conceptualized and operationalized personal innovativeness in different ways, most contemporary researchers considered it as a personality trait (Roehrich, 2004; Svendsen et al., 2013) derived from sensory/cognitive motivations of individuals (Venkatraman, 1991). It is also

palpable that Leavitt and Walton (1975) recognized personal innovativeness as trait but they believed that persons high in innovativeness are low in recognition of potential applications of ideas, therefore, they would be far from pragmatism. Present research deems that view of Leavitt and Walton lacks the realism because people high in innovativeness based self-esteem (IBSE) always prefer to apply their ideas practically (Anwar, 2018; Anwar, 2020). It is worth mentioning that Kirton (1976) also considered innovativeness as a personality trait and associated it with analysis of organizational change. Following Roehrich (2004), Sari et al. (2018), and Svendsen et al.'s (2013) stance, the present study considers personal innovativeness of individuals as a trait and believes that individuals attempt to evaluate their personal innovative capabilities to determine their self-worth. This concept has been termed as innovativeness based self-esteem (IBSE) by the researcher of this study.

Literature reflects that Maslow's theory of motivation encourages innovation and creativity (Madsen & Wilson, 2012). Likewise, Lin and Filieri (2015) revealed that individuals' motivation to achieve innovative outcomes boost their self-esteem level over time. Based on the significance of personal innovativeness and its impact on self-esteem, this study determined to include personal innovativeness into the nomological network to establish an evidence of construct validity of innovativeness based self-esteem (IBSE).

2.5 Underlying Theories

This section provides an explanation of the theories employed to determine nomologicals to innovativeness based self-esteem (IBSE). In addition, the relevance of these theories with self-esteem and innovativeness is also discussed by citing relevant literature. It is important to mention that there are two schools of thought about selection of nomologicals and nomological network functioning (Ralph & Tempero, 2018). First school of thought i.e., "positivism" focuses on epistemology, meaning, and correlation (Cronbach & Meehl, 1955; Matsuda et al., 2011). However, second school of thought i.e., "realism" emphasizes on ontology, reference, and causation (Borsboom et al., 2004; Tierney & Farmer, 2002). Although both schools of thought have their own *pro et contra*, the researcher of the present study is a proponent of second school of thought. Literature shows that ontologically developed nomological networks not only provide theoretically driven relationships between nomologicals and outcome construct but also overcome other weaknesses of prototypical epistemological processes as identified by Borsboom et al. (2004). Therefore, the researcher developed the relationships presented in nomological network based on theoretical linkages between constructs and designed hypotheses in predictive manner. This concept has been explained further in the section elucidating research paradigm of this study in Chapter 3.

2.5.1 Maslow's Theory of Motivation

Maslow (1943) was the pioneering psychologist who provided a well-articulated theory on human needs and motivation to address the question

"what motivates human behaviour?" Although his contemporary psychologists were investing their efforts to understand psychoanalysis and behavioural psychology, he was more concerned to learn and understand potential motives that trigger human behaviour. Maslow realized that human being has an intrinsic need for self-actualization but before meeting this higher level need some basic needs should be met such as food and water, safety and shelter, love and affection, and self-esteem. This theory is generally known as Maslow's hierarchy of needs. He structured these needs at levels. He argued that in order to move to subsequent level the lower-level needs have to be met. For instance, an individual can only move to the need for self-esteem, if the lower-level needs like physiological needs, safety needs and social needs have already been met.

Similar to many other social science theories, Maslow's theory of needs has also been criticized in literature. For instance, researchers criticized the arrangement of levels of needs (Wahba & Bridwell, 1976), and shape of pyramid (Bridgman, Cummings, & Ballard, 2019); however, significant literature advocates and reinforces Maslow's theory of motivation (Li-Ping, Ibrahim, & West, 2002; Mihinjac & Saville, 2019). Recent literature shows that researchers adopted Maslow's theory of motivation to support various research frameworks like crime prevention (Mihinjac & Saville, 2019), employee motivation and organizational performance (Lee & Raschke, 2016), customer perceived value (Almquist, Senior, & Bloch, 2016), employee motivation (Alajmi & Alasousi, 2018), therapeutic creativity (Mansager & Bluvshtein, 2017), technological innovations (Bennett, 2006), innovative

sustainable project management (Mohammadian & Rezaie, 2019) etc. In addition to the application of Maslow's theory of motivation in various research contexts, contemporary research scholars explicitly realized and discussed the significance of this theory. For instance, Abulof (2017) signified in his article "why we need Maslow in the 21st century" that understanding human motivation is essential to explain social actions of humans. Likewise, Bridgman et al. (2019) also acknowledged that Maslow's theory of motivation has its own merits and is popular in management studies, education, and psychology.

Turabik and Baskan (2015) explicated Maslow's theory of motivation by mentioning that individuals attempt to satisfy their needs according to the level of importance of each need. These needs play an important role to determine individuals' behaviour. From the perspective of the present study, the need of self-esteem and its fulfilment for employees working in organizations is essential for higher level of employees' innovative performance. Esteem needs reflect personal worth, social inclusion, achievement, appreciation by others, freedom of thought and choice, independence, and gaining respect in society (Alajmi & Alasousi, 2018). Mohammadian and Rezaie (2019) reported that self-esteem need is also fulfilled when an individual accomplishes something innovative. Madsen and Wilson (2012) affirmed that Maslow's theory of motivation encourages innovativeness and creativity. In social context, individuals think that their efforts and accomplishments must be recognised by other members of society. However, if their efforts and achievements are not recognised properly, they

feel disappointed and inferior. Since self-esteem is a strong motivator of human behaviour (Maslow, 1943), Maslow's theory justifies that self-esteem should be considered as a nomological to the innovativeness based self-esteem (IBSE).

Nevertheless, based on the domain specific nature of innovativeness based self-esteem (IBSE) (Anwar, 2020; Anwar et al., 2020), organization based self-esteem (OBSE) construct has been included into the nomological network of innovativeness based self-esteem because organization based self-esteem (OBSE) is a domain-specific facet of self-esteem (Gardner & Pierce, 2015). In addition, Maslow's theory also helps to view innovativeness based self-esteem (IBSE) as a function of job performance in the context of predictive validity of innovativeness based self-esteem which will be mentioned in related section of this study.

2.5.2 Self-Determination Theory

Self-Determination Theory (SDT) presented by Deci and Ryan (2000) has become a well-researched and practiced metatheory of motivation and personality development. It highlights intrinsic propensities and motivations of people essential to explore, engross, and master their environs. The literature shows that state of ample self-esteem can only be attained when fundamental psychological needs of individuals are in balance (Sol & Vasco, 2017). Self-Determination Theory (SDT) explains the situation of employees when they pursue a routine task or innovative outcome with devotion and vitality, even if

there are no external rewards and benefits offered by employer (Deci, Olafsen, & Ryan, 2017). The theory proposes that in order to understand innate motivation of such employees, their cognitive assessment of rewards, constrictions, and pressures within the work environment must be studied (Sheldon, Turban, Brown, Barrick, & Judge, 2003). Deci and Ryan (2000) introduced the notion of rudimentary psychological needs of individuals they strive to fulfil in order to succeed and grow. These needs are autonomy, competence, and relatedness.

Self-Determination Theory (SDT) argues that satisfaction of three psychological needs leads to increase individual's well-being, psychosomatic health, and performance outcomes (Deci, Olafsen, & Ryan, 2017). According to Deci and Ryan (2000), need for autonomy reflects individuals' desire to have control over their own actions and freedom to make their own choices. In other words, people would feel that they are master of their fate and control their own behavior. The need for relatedness is similar to Maslow's social needs. Relatedness describes that the humans struggle to build personal relationships with a sense of belongingness with others. Every human being needs other society members to some extent. The need for competence denotes people's achievements, skills, and knowledge in their domain. People need to have capacity to interact with their own environment and develop mastery over significant tasks or objectives.

The significance of self-determination theory to study human motivation to succeed and outperform is not hidden. Literature shows that

researchers applied self-determination theory to investigate various research themes like creative performance and customer satisfaction (Martinaityte, Sacramento, & Aryee, 2019), work motivation outcomes (Deci, Olafsen, & Ryan, 2017), psychological needs satisfaction and motivation (Kirkland, Karlin, Stellino, & Pulos, 2011), organizational innovative capacities (Sipe, 2018) etc.

Since self-determination theory has been adopted by scholars to explain employee creativity and innovativeness related studies, the researcher reasonably believes that self-determination theory supports the selection of employee job autonomy as a nomological to innovativeness based self-esteem (IBSE) (Martinaityte et al., 2019; Sipe, 2018). Using self-determination theory, Sipe (2018) investigated how senior management facilitates innovative organizational capabilities. To construct a context-specific model of innovative organizational capacities, he analysed psychological needs for relatedness and autonomy. He did, however, mention that the psychological need for autonomy could be vital for organizational innovation. Correspondingly, Krause, North, and Davidson (2019) used self-determination theory to examine employees' motivation and well-being in the higher education sector and discovered that psychological needs for competence and autonomy are positively allied to self-esteem. The findings of their study were similar to those of Patrick, Knee, Canevello, and Lonsbary (2007). Patrick et al. (2007) underpinned their study, exploring relationship functioning and well-being, using self-determination theory and discovered a substantial association between autonomous people and their self-esteem. Based on above

literature, self-determination theory is notable to determine significant positive relationship between psychological need for autonomy and self-esteem. Therefore, it is reasonable to select job autonomy as a nomological to innovativeness based self-esteem (IBSE).

2.5.3 Goal Orientation Theory

For almost four decades, goal orientation theory has been used to explain individual behaviour and performance (Chazan, Pelletier, & Daniels, 2022; Nicholls, 1984), organizational innovativeness (Che-Ha, Mavondo, & Mohd-Said, 2014), self-concept and self-esteem (Peixoto et al., 2016), individual creativity (Zhang et al., 2020), and many other research frameworks in education, psychology, and organizational behaviour. Vandewalle, Nerstad, and Dysvik (2019) mentioned that the concept of goal orientation was first coined by John Nicholls in 1984 as an individual motivation theory. They further mentioned that hitherto researchers described human behaviour with the help of internal dispositions (i.e., personality traits), Dweck (1999) supported that trait theories do not precisely answer to "the why of behaviour and how individuals work and change". In comparison, she advocated that motivation theories can better explain research questions about human resource behaviour. Ahmed et al. (2017) also affirmed that goal orientation theory has been extensively used in literature to explain individual differences motivating individual behaviour.

Vandewalle et al. (2019) reported that goal orientation consists of two broad types of orientations i.e., learning goals and performance goals. Individuals high in learning goal orientation seek to enhance their competence level by learning something new. In contrast, individuals high in performance goal orientation always try to attain favourable judgements about their competence. In simple words, learning goal orientation emphasizes on ability development of an individual, whereas performance goal orientation focuses on ability demonstration by an individual. This study will focus on learning goal orientation because literature associated it with self-concept and self-esteem (Button et al., 1996; Dweck & Leggett, 1988). Kunst, Woerkom, and Poell (2018) cited that learning goal orientation implies intention of individuals to produce competencies, and assimilate new knowledge and skills.

People high in learning goal orientation unremittingly explore and strive for new ways of work to improve their knowledge and skills. Teunissen and Bok (2013) revealed that self-esteem of study subjects was increased when they adopted learning goals in a longitudinal study setting. Remarkably, Zhang et al. (2020) contended that learning goal orientation controls individual's attention and activities in workplace which advances innovative solutions to thought-provoking work-related problems. As mentioned earlier, individuals high in learning goal orientation not only enjoy higher degree of innovativeness, but they also reflect higher level of self-esteem. Therefore, it is reasonable to select learning goal orientation as a nomological to innovativeness based self-esteem (IBSE).

2.6 Concept of Innovativeness Based Self-Esteem

Innovation was primarily defined in the product, process, technological, system, and administrative contexts in organizational literature. Personal innovation can be conceptualized in numerous ways. Scholars operationalized this concept in terms of individual characteristics, outcomes, and behaviours. For example, literature deemed that individual innovation would be personality-based (Hurt et al., 1977; Sari et al., 2018). Obviously, the cause of all organizational innovation is human being, therefore, present study focuses on personal innovativeness of workforce. Leavitt and Walton (1975: p. 549) delineated it as "trait reflecting a person who welcomes new experiences and works in his own meaningful ways to experience different and novel stimuli", whereas Rogers (2003: p. 22) defined it as "the extent to which a person or unit of adoption is relatively earlier than other subjects of his circle."

Another psychological construct present study deals with is self-esteem. Rosenberg (1965: p. 16) states that "self-esteem reflects extent to which individuals feel pride in themselves, their capabilities and worthiness". "Similarly, Coopersmith (1967: p. 4) defined it as "degree to which person believes himself to be successful, capable, significant, and worthy". Being an evaluative aspect of self-concept (Baumeister, 1998; Sari et al., 2018), self-esteem is considered as an attitude of consent and designates person's beliefs about his abilities, aptitudes, social relationship development, and other personal outcomes. Thus, seeing personal innovativeness as a trait, present

study deduces that an individual may evaluate himself for being innovative in organizational settings. Moreover, Zhou and Velamuri (2018) mentioned that innovative work behaviour of workforce includes both incremental improvements and radical departures. Based on above definitions, innovativeness based self-esteem (IBSE) is defined as "extent to which individuals feel pride and worthiness in their incremental and/or radical innovative capabilities" (Anwar et al., 2020; Anwar, 2020). The researcher believes that innovativeness based self-esteem (IBSE) should be confined within self-concept paradigm and is a *sui generis* universal because it reflects characteristics and faculties manifested by person's innovativeness specific feelings and evaluations about self (Anwar et al., 2020). (Note: The jingle-jangle fallacies related to innovativeness based self-esteem (IBSE) are provided in Appendix-II for information purpose only).

2.7 Construct Validation: A Stepwise Approach

This study determines a stepwise approach to achieve a viable and functional psychological construct. The study specifically selected research articles on psychological constructs validation/extension conducted by Hoffman et al. (2015), Kakkar et al. (2016), Matsuda et al. (2011), Shen et al. (2014), and Tierney and Farmer (2002). By synthesizing these studies, current study identifies important steps to achieve a fully functional psychological construct.

With a focus on understanding the construct validation process, it is crucial to apprehend the concepts of construct and construct validity. According to Cronbach (1971, p. 464), construct is "an intellectual device by means of which one construes events". Nevertheless, Sellitiz, Wrightman, Cook, and Kidder (1987) mentioned that constructs are operationalizations of abstractions considered by social scientists in their theories. In the same line, Gravetter and Wallnau (2014, p. 18) defined constructs as "hypothetical concepts that are used to help describe and explain behaviour". Some examples of constructs frequently studied in organizational behaviour and psychology are self-concept, satisfaction, loyalty, personality traits, knowledge sharing, citizenship behaviour, anti-social behaviour, leadership behaviour etc.

While constructs are crucial to psychology and behavioural sciences, evidence to establish the basis of their validity is also imperative. For a new or extended construct, it is required to establish scientific evidence that the proposed or extended construct is reflecting the true theoretical structure under consideration. In the view of Cronbach and Meehl (1955, p. 290) construct validity refers to "the degree to which a measurement actually reflects the theoretical construct". It simply means that for proposed construct, theoretical patterns should match the observed patterns. In order to establish construct validity of new or extended constructs, psychologists devised methods like development of nomological network (Cronbach & Meehl, 1955), Multitrait-Multimethod Matrix (Campbell & Fiske, 1959), and Pattern Matching (Trochim, 1989). In the current study, the nomological network method will

be applied in order to determine the potential antecedents to innovativeness based self-esteem (IBSE) and establish theoretical construct validity which is in line with the works of Agarwal and Prasad (1998), Shen et al. (2014), and Tierney and Farmer (2002). It should be noted that none of the mentioned methods deal with theoretical construct validity except nomological network.

This study analysed five research papers to determine a stepwise approach to get a fully functional psychological construct. An analysis of the study conducted by Hoffman et al. (2015) suggested that to validate assessment centre ratings (ACR), first, Hoffman and his colleagues developed a nomological network by including personality traits from five factor model and general mental ability as nomologicals. Second, they established evidence of predictive validity for assessment centre ratings by examining the bivariate relationship between assessment centre ratings types and job performance. Third, they tested theory of interactionism (i.e., person-situation interaction) for assessment centre ratings.

In a study conducted to extend promotive and prohibited voice constructs, Kakkar et al. (2016) included approach orientation and avoidance orientation as nomologicals to promotive and prohibited voice. Secondly, they applied theory of interactionism and tested whether role expectation moderates that relationship between approach/avoidance orientation and promotive voice. They also tested the moderating role of role expectations for the relationship between approach/avoidance orientation and prohibitive voice.

Analysis of a study organised by Matsuda et al. (2011), to develop Japanese version of organization based self-esteem (JV-OBSE), showed that first, they developed nomological network by selecting global self-esteem, job complexity, and perceived organizational support as nomologicals to Japanese version of organization based self-esteem (JV-OBSE). Second, they tested predictive validity for Japanese version of organization based self-esteem (JV-OBSE) by examining whether it predicts three criteria variables i.e., job satisfaction, work engagement, organization citizenship behaviour.

Similarly, Shen et al. (2014) developed a nomological network to establish construct validity of adult playfulness trait (APT) construct and included self-as-entertainment, playing, goal attainment, and leisure boredom as nomologicals. Second, to test the predictive validity of adult playfulness trait, they correlated adult playfulness trait scores with playfulness behaviour. Third, they included theory of interactionism in their study to test how playfulness trait interacts with the environment and what are the emotional and behavioural consequences of this interaction.

Tierney and Farmer (2002) tested nomological validity of creative self-efficacy construct by creating a nomological network. They included job knowledge, job self-efficacy, supervisor behaviour, and job complexity as antecedents to creative self-efficacy. Second, they applied theory of interactionism to hypothesize that job tenure will moderate the effects of job complexity on creative self-efficacy. They considered job tenure as personal

factor and job complexity as contextual factor. Third, the evidence of predictive validity was founded by testing predictive relationship between creative self-efficacy and creative performance. The tabulated results of these studies are provided below in Table 2.3.

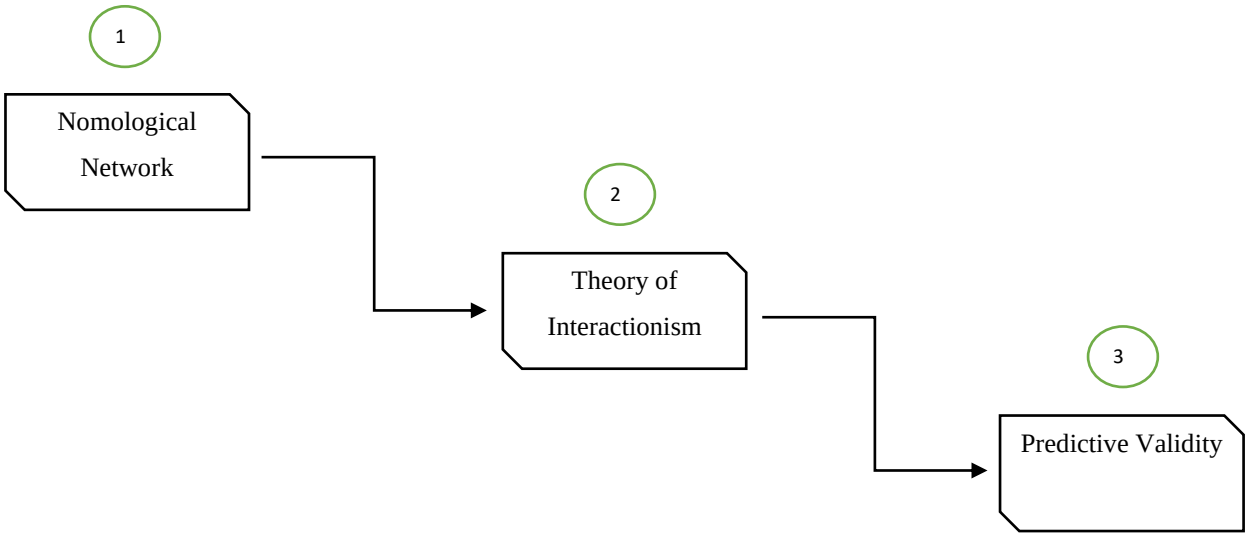
Table 2.3 Selected Studies Exploring Construct Validity

Study	Validation Type	Construct Name	Nomological Network	Theory of Interactionism	Predictive Validity
Hoffman et al. (2015)	Construct Extension	Assessment Centre Exercises	Yes	Yes	Yes
Kakkar et al. (2016)	Construct Extension	Promotive and Prohibitive Voice	Yes	Yes	No
Matsuda et al. (2011)	Construct Extension	Japanese version of Organisation Based Self-Esteem	Yes	No	Yes
Shen et al. (2014)	New Construct	Adult Playfulness Trait	Yes	Yes	Yes
Tierney and	New Construct	Creative Self-	Yes	Yes	Yes

Farmer (2002)	Efficacy	

Source: Established for this research

Based on above review of related construct validation studies, present research identified three steps approach to achieve a viable and valid construct as shown in Figure 2.1.



Source: Established for this research

Figure 2.1 **Construct Validation Process Steps**

Following the directions given in above presented literature, in the first step, a nomological network is developed specific to innovativeness based self-esteem (IBSE) and related hypotheses are proposed. In the second step, hypothesis is proposed to test the theory of interactionism. Finally, in the third step, hypothesis to determine predictive validity of innovativeness based self-esteem (IBSE) is proposed.

2.7.1 Nomological Network

It is an established scientific fact that a good theory should be able to establish the elemental properties and relationships between constructs. In order to establish these properties and relationships, Cronbach and Meehl (1955) presented first prim and proper articulation of construct validity. They view construct validity as "interlocking system of laws which constitutes a theory" (p. 290). They argued that in order to establish evidence of construct validity for a measure, nomological network must be developed. This network will provide a theoretical framework representing theoretical concepts and their relationships, an empirical framework determining the measurements and their relationships, and connections between the theoretical and empirical realms. Borsboom et al. (2004, p. 1064) mentioned the significance of nomological network in the following way:

> "Construct validity theory depends crucially on the availability of a nomological network. This network does double duty. First, it is said to give an implicit definition of psychological constructs, in the same way that the positivists attempted to define theoretical terms. Second, it serves to generate the idea of construct validity itself, which consists in the agreement between the nomological network and empirical data. That is, a test can be considered valid for a construct if the empirical relations between test scores match the theoretical relations between constructs".

Likewise, Preckel and Brunner (2017, p. 1) realized the importance of nomological network to establish construct validity thus:

> "Cronbach and Meehl introduced the idea of construct validity to validate theoretical attributes or qualities (i.e., constructs) for which there is no adequate criterion or which cannot be defined operationally, for example, personality traits or intelligence".

Preckel and Brunner (2017, p. 1) further mentioned that:

> "The concept of the nomological network has been highly influential in research in the behavioural sciences and is still widely used. For example, a recent PsychINFO search in May 2016 revealed 655 journal articles published in the new millennium in the field of differential or personality psychology and assessment that apply the terms "nomological net" or "nomological network".

Besides some criticisms on this method, identification of nomologicals is still a popular method to demonstrate construct validity among contemporary organizational psychologists. For instance, Hyatt et al. (2018) examined nomological network of self-esteem and narcissism to establish the construct validity. Similarly, Howard (2018) studied nomological network to validate the measure of retroactive influences. The researcher observed nomological network as depiction of theoretical constructs, their

manifestations and their interrelations. Likewise, Posey et al. (2015) asserted that a construct exhibits acceptable nomological validity only if the interrelations between it and its antecedents are greater than zero. Table 2.4 lists selected studies developed nomological network to determine antecedents to the constructs under investigation and establish construct validity. These studies are related to organizational behaviour, human resource management, marketing, and psychology.

Table 2.4 Selected Studies Developed Nomological Network

No.	Author(s)	Title	Source
1	Hartmut et al. (2019)	A nomological network of customers' privacy perceptions: Linking artifact design to shopping efficiency	European Journal of Information Systems
2	Brown et al. (2018)	The nomological network of a behavioral distress tolerance task in veterans	Journal of Traumatic Stress
3	Lajom et al. (2018)	Dualistic passion for work and its impact on career outcomes: Scale validation and nomological network	Journal of Career Assessment
4	Hyatt et al. (2018)	Narcissism and self-esteem: A nomological network analysis	PLOS ONE
5	Matsuda et al. (2011)	Development and validation of the Japanese version of organization-based self-esteem scale	Journal of Occupational Health

6	Tierney and Farmer (2002)	Creative self-efficacy: Its potential antecedents and relationship to creative performance	Academy of Management Journal

Source: Established for this research

Two nomological networks have been reviewed to get an understanding on how other researchers developed and analysed nomological network in their studies investigating construct validity of extending construct and/or newly developed construct. For this purpose, studies conducted by Matsuda et al. (2011), and Tierney and Farmer (2002) have been discussed and critically analysed below.

2.7.1.1 Nomological Network Developed by Matsuda et al. (2011)

In a valuable and interesting study titled "Development and validation of the Japanese version of organization-based self-esteem scale", Matsuda et al. (2011) developed and validated Japanese version of organisation based self-esteem (JV-OBSE). By adopting the study of Pierce at al. (1989), Matsuda and his colleagues developed a nomological network. They mentioned that because Pierce et al. (1989) and, Tang and Gilbert (1994) reported a positive empirical relationship between organisation based self-esteem (OBSE) and global self-esteem, therefore, they also expected the same relationship and hypothesized a "positive association between JV-OBSE and global self-esteem". After reporting this relationship, they found the antecedents to JV-OBSE. They argued that Pierce et al. (1986) provided the

basis that job complexity demands moderate/high level of ability and autonomy which would lead to interesting, challenging, meaningful and important work on job. In addition, scholars mentioned that review conducted by Pierce and Gardner (2004) illustrates that there exists a positive relationship between job complexity and OBSE. In addition, they also reviewed previous studies citing the positive relationship between perceived organizational support and OBSE. Therefore, based on these arguments, Matsuda et al. (2011) hypothesized a positive association between job complexity and JV-OBSE, and a positive association between perceived organizational support and JV-OBSE . Figure 2.2 depicts the nomological network specific to JV-OBSE.

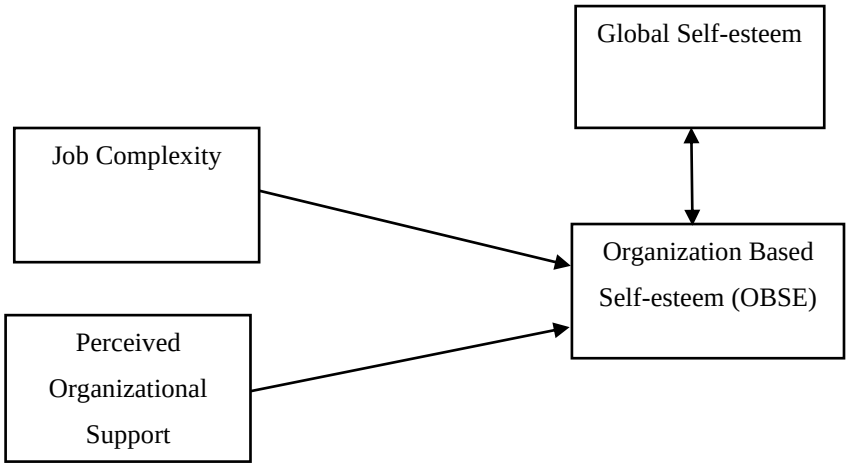


Figure 2.2 Nomological Network Developed by Matsuda et al. (2011)

The results of this study show that researchers found significant positive associations between global self-esteem and OBSE (r=0.59, p<0.001), significant relationship between job complexity and JV-OBSE (β=0.68, p<0.001), significant relationship between perceived organizational support

and JV-OBSE (β=0.13, p<0.001), thereby supporting all nomological network related hypotheses. These results provide evidence that JV-OBSE is a valid construct. Beside the merits of this study, the researcher of this study identified that Matsuda et al. (2011) followed a citation driven approach towards the development of hypotheses and for establishment of nomological network. In addition, the study overlooked important literature regarding establishment of nomological network; it is observed that researchers had not built their arguments about nomological network by following preferred ontological assumptions. Although epistemology driven approach is an old and widely adopted school of thought regarding construct validity, contemporary researchers prefer to follow ontology driven nomological network development (Borsboom et al., 2004; Tierney & Farmer, 2002).

2.7.1.2 Nomological Network Developed by Tierney and Farmer (2002)

The second nomological construct validity study being discussed in this thesis was conducted by Tierney and Farmer (2002). The researchers developed nomological network to establish construct validity of their new proposed construct "creative self-efficacy". They adopted Gist and Mitchell (1992) model as conceptual reference for their study and determined the general determinants to creativity as proposed by Gist and Mitchell (1992). Therefore, they selected job knowledge, job self-efficacy, supervisor behavior, and job complexity as antecedents to creative self-efficacy. Their nomological network is shown in Figure 2.3. Instead of tapping job knowledge directly, they used job tenure and education level as proxy variables to job knowledge based on the argument that job experience and formal education are two

sources of knowledge (Gist & Mitchell, 1992). Therefore, they hypothesized that "education level and job tenure will positively predict creative self-efficacy". Building their stance on studies conducted by Gist and Mitchell (1992), and Bandura (1997), they argued that general job efficacy may be needed to formulate more centered, job related creative self-efficacy. Therefore, they hypothesized that "job self-efficacy will positively predict creative self-efficacy". To develop link between supervisor support and creative self-efficacy, both researches cited the argument developed by Amabile and Gryskiewicz (1987). These researchers mentioned that employees are dependent on signals sent from their work environment to become creative; supervisors play an essential role in framing employees' efficacy believes; confidence building behavior is a major requirement for employees to become creative. Hence, Tierney and Farmer (2002) hypothesized that "supervisor support will positively predict creative self-efficacy". Further, authors mentioned that complex jobs demand experiments and flexibility which would provide an opportunity to apply cognitive processes and faculties which is pervasive to creativity. Therefore, Tierney and Farmer (2002) expected that individuals performing complex jobs would have greater efficacy believes as compared to individuals not performing complex jobs. Hence, they hypothesized that "job complexity will positively predict creative self-efficacy". This nomological network is depicted in Figure 2.3.

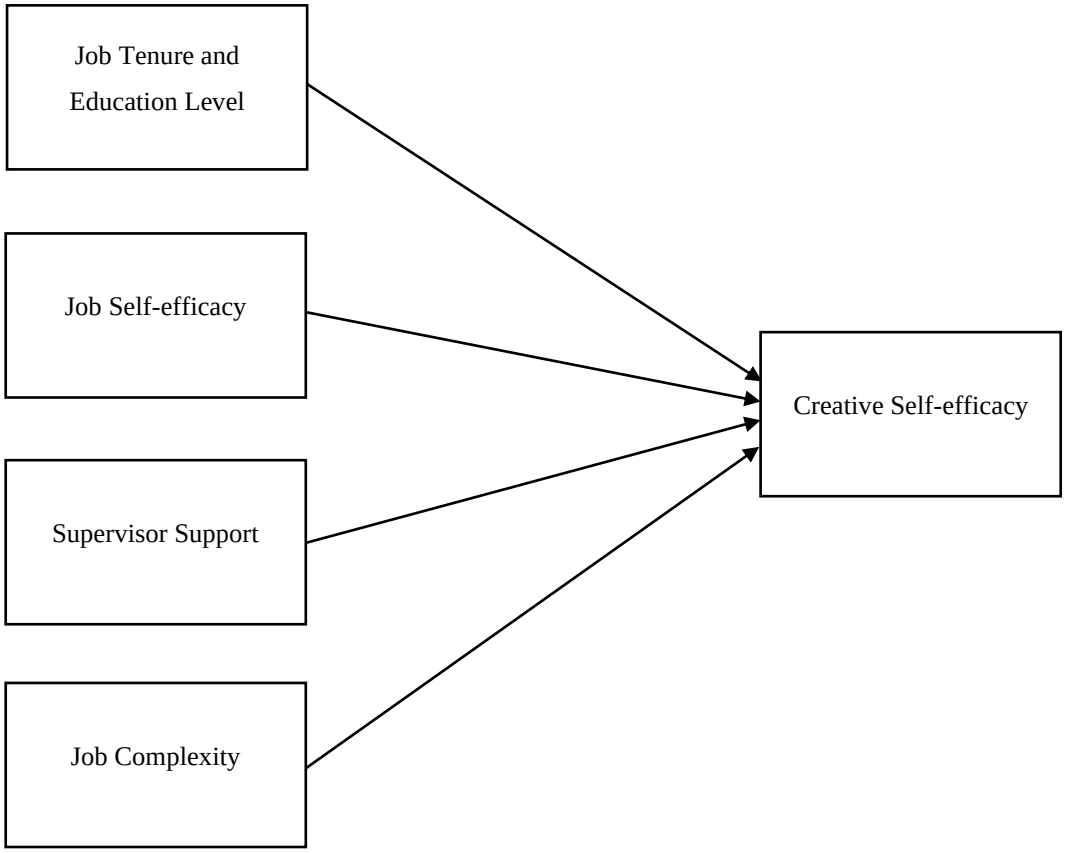


Figure 2.3 Nomological Network Developed by Tierney and Farmer (2002)

Tierney and Farmer (2002) performed hierarchical regression analysis to test their nomological network and found that results for relationship between job tenure and creative self-efficacy (β=-0.08, p<0.05), and relationship between education level and creative self-efficacy (β=0.08, p<0.05) provided partial support to first hypothesis. Result for relationship between job self-efficacy and creative self-efficacy (β=0.41, p<0.01) provided full support to second hypothesis, whereas result for relationship between supervisor support and creative self-efficacy (β=0.10, p<0.05) provided full support to third hypothesis. The result for relationship between job complexity

and creative self-efficacy (β=0.20, p<0.01) also provided full support to fourth hypothesis. The researcher of present study believes that use of proxy variables to measure job knowledge could be a potential shortcoming of Tierney and Farmer's (2002) nomological network.

2.8 The Proposed Nomological Network for Innovativeness Based Self-esteem

The development of nomological network is vital to establish construct validity in theory driven traits research (Chester & Lasko, 2021; Posey et al., 2015). The purpose of developing a nomological network is to predict the relationship of traits with external criteria in advance from an established scientific theory. The reason of developing nomological network is to purify new construct by filtering out the common sense interventions or superficial analysis of traits in research (Anwar, 2020).

This study developed personal innovativeness specific preliminary nomological network considering personal innovative capabilities as a mathematical function of individual traits and work environment as suggested by Ali (2019) (mathematically, innovativeness = f (traits & work environment). Accordingly, employee dispositional attributes and work characteristics are studied concomitantly (Huynh et al., 2019). Literature echoes various drivers (e.g., personal factors) to innovative behaviour. For instance, Scott and Bruce (1994) hypothesized that work group relations, individual problem-solving style, and leadership style influence individual's

innovative behaviour directly and indirectly. Hult, Hurley, and Knight (2004) reported entrepreneurial orientation, learning orientation, and market orientation as significant predictors of innovativeness and enhancers of business performance. Similarly, Nybakk, Crespell, Hansen, and Lunnan (2009) tested entrepreneurial climate, learning orientation, and social network in their small and medium enterprises (SMEs) study settings and found them significant antecedents to innovativeness. In the same way, Riaz, Xu, and Hussain (2018) identified that organizational support for innovation is an important correlate of innovative work behaviour in Chinese perspective.

Conversely, Amabile (1996) highlighted that the contextual factors play an important role to engage people in generation of innovative and useful ideas. Hornung and Rousseau (2007) determined that among these factors (e.g., autonomy, supportive leadership, organizational climate, transformational leadership etc.), job autonomy plays a vital role in motivating employees, and shaping their attitudes and behaviours. For instance, Orth and Volmer (2017) hypothesized that employees with high level of job autonomy in their daily job roles are more likely to generate unique ideas and handle work related problems proactively. In a recent study investigating antecedents to an entrepreneur's innovative behaviour at work, Williamson, Battisti, Leatherbee, and Gish (2019) found that sleep quality is a significant antecedent to an entrepreneur's innovative work behaviour. Their findings were in line with effort-recovery model (Meijman & Mulder, 1998).

Present thesis creates a nomological network resulting in a set of proposed hypotheses leading to validate the innovativeness based self-esteem construct and its measurement. Following the past literature, three personal and one contextual construct are selected as nomologicals/antecedents to innovativeness based self-esteem (IBSE) in order to restrain the research framework of this study and to satiate the directions to develop nomological network as suggested by Cronbach and Meehl (1955), Eysenck (1981), and Hartmut et al. (2019).

Organization-based self-esteem (OBSE), personal innovativeness, and learning goal orientation were selected as nomologicals to innovativeness based self-esteem (IBSE). Literature reports that learning goal orientation is a significant predictor of employee innovative behaviour (Zhou, 2021). While the select contextual factor is job autonomy which is considered as a work characteristic that affects employees to involve in innovative behaviour (Purc & Laguna, 2019; Sipe, 2018). Learning goal orientation is selected because Dweck and Leggett (1988) cited that it is not only associated with self-esteem but is a discrete construct and may add value to understand behaviour of individuals. While, achievement goal theory (Chazan et al., 2022; Nicholls, 1984) proposes that individuals have various tendencies to evaluate their capabilities. These individual differences are meaningfully reflected in goal orientations. Job autonomy is selected because literature shows that autonomy orientation is positively and significantly related to self-esteem (e.g., Deci & Ryan, 1985; Koestner, Bernieri, & Zuckerman, 1992; Krause et al., 2019) and is important to enhance employees' job performance (Levine, 1994; Pang &

Lu, 2018). In addition, self-determination theory (SDT) propositioned by Deci and Ryan (2000) contends that individuals exhibit innate psychological needs (e.g., relatedness, competence, autonomy) and if these needs are significantly met, they would optimally perform and strengthen their competencies. This would boost individual growth, vivacity, wellbeing of employees, and eventually, steer to valid high self-esteem. Applying self-determination theory (SDT), Sipe (2018) investigated how do senior organizational managers enable innovative organizational capabilities? He used need for autonomy and relatedness to develop theoretical argument in his research. Based on these concepts, present research anticipates that job autonomy of employees could be a significant contributor to innovativeness based self-esteem (IBSE).

2.8.1 Development of Current Hypotheses

2.8.1.1 Self-Esteem and Personal Innovativeness

Social scientists consider that high self-esteem plays a significant part in the development of an individual's personality and abilities (Pagaduan-Apostol, 2017). Self-esteem, according to Jurek and Besta (2021), is a prerequisite for productive behaviour and improved performance. Employees that have high self-esteem are capable, industrious, efficient, quality-oriented, and believe they deserve success. Previous research on the relationship between individual innovativeness and self-esteem discovered a positive significant relationship between the two constructs. For example, Goldsmith and Matherly (1987), investigated the relationship between Kirton's

adaptation-innovation inventory (KAI) and Rosenberg's self-esteem instrument. They discovered that innovative people are more likely to have strong self-esteem. Similarly, Schutz (1994) claimed that high self-esteem is linked to creativity, motivation, and employee productivity. His account also corroborated the Goldsmith and Matherly's (1987) conclusion. In the same vein, Sternberg and O'Hara (1998) looked at the self-esteem profiles of individuals engaged in creative decision-making in various organizations and found alike relationship. Mason (2001) found that employees with high self-esteem are more willing to experience unique and thought-provoking jobs, are dynamic, and innovative than those with low self-esteem. Relatedly, Keller (2012) discovered that self-esteem is a key determinant of employee unique performance outcomes, while Maden and Koker (2013) discovered that self-esteem is a strong predictor of customer innovativeness in their study sample. In a study looking into materialisation and its antecedents, Shoham et al. (2015) discovered a non-significant link between low self-esteem and personal inventiveness. Based on the findings of this study, a positive substantial association between high self-esteem and personal innovativeness can be deduced. Gentina and Kratzer (2020) also found positive significant association between self-esteem and consumer innovativeness.

To emphasize the importance of self-esteem, Koltko-Rivera (2006) amended Maslow's theory of motivation and emphasized that people's self-esteem is raised when their accomplishments are acknowledged by their social circles. As per the standpoint of this study, the crave for self-esteem and its fulfilment among people working in firms is critical for increased levels of

innovative work performance. According to Madsen and Wilson (2012), Maslow's theory of motivation emphasizes the necessity of innovation and creativity in companies. Employees' motivation to produce innovative results boosts their self-esteem over a period of time (Lin & Filieri, 2015). While self-esteem is a powerful motivator of hominoid behaviour (Maslow, 1943), this theory explains that self-esteem, which is an *a priori* correlate of innovativeness based self-esteem (Anwar, 2020), should be regarded as a nomological to the innovativeness based self-esteem construct (IBSE).

Self-esteem was demarcated as a hierarchical construct (Białecka-Pikul et al., 2019). Heatherton and Polivy (1991) separated it into three distinguished components: performance, social, and physical self-esteem. Self-esteem based on performance comprises assessments of one's abilities, performance, capacity, and confidence. Individuals' evaluations of how other people perceive them and how they consider their physical bodies are referred to as social and physical self-esteem. Self-esteem based on performance is mostly focused on an individual's accomplishments in physically demanding tasks/assignments rather than on superficial assessments of one's talents. According to the literature, self-esteem can be related to the self in totality or specific facets of self, such as global self-esteem and domain-specific self-esteem (Rentzsch & Schröder-Abé, 2018). Global self-esteem is seen to be a consistent trait that reflects how people feel about themselves. Coopersmith (1965), as well as Saini et al. (2021), consider it as a cognitive approach to determining one's worth. Brown and Marshall (2001), and Harris and Orth (2020) described it as a feeling of affection for self.

Despite the importance of a global view of self-esteem (Erdvik et al., 2020), many self-esteem theories placed a strong emphasis on domain-specific self-esteem (e.g., James, 1892; Orth et al., 2021). Rosenberg et al. (1995) extended the Fishbein and Azjan's (1975) model and found that specified self-esteem had a stronger influence on an individual's behaviour than global self-esteem. The paradigm of Fishbein and Azjan (1975) emphasizes the ability of an attitude to conceive a behaviour as a consequence of how closely that attitude is linked to the conduct in question. Rosenberg et al. (1995) hypothesized that a specific attitude could more accurately predict behaviour. According to Rosenberg et al. (1995), an individual employee may consider himself or herself worthy if he or she has a high level of personal innovativeness in related domain.

Literature advocates that people may evaluate themselves in various capacities, different contexts, and domains of life like moral-self, work-self, academic-self, non-academic-self, social-self, athletic-self etc. (Fitts & Warren, 1996; Orth et al., 2021). The most germane context to present enquiry, in which self-esteem evolves, is the organizational context. Hence, organization based self-esteem (OBSE), also attributed as a domain or context specific self-esteem (Gardner & Pierce, 2015), could be coupled to the innovativeness based self-esteem (IBSE) which is also considered as domain specific self-esteem (Anwar, 2020; Anwar, et al., 2020). Pierce et al. (1989, p. 625) delineated organization based self-esteem (OBSE) as the extent to which a person believes himself to be significant, meaningful, capable, and valuable within their employing corporation. Gardner and Pierce (2015) point out that

Pierce et al. (1889) furthered the definition of organization based self-esteem (OBSE) by appending an organization based context into the definition of Coopersmith (1967). Kanning and Hill (2012), and Zhao and Liu (2021) also adopted OBSE in the context of their study following Pierce et al.'s (1989) definition of organization based self-esteem (OBSE). It has already been reported that self-esteem and personal innovativeness are significantly correlated, accordingly, organization based self-esteem (OBSE) may predict personnel's innovativeness based self-esteem in a works setting. Based on mentioned theoretical propositions, following hypotheses are proposed:

Hypothesis 1: Personal innovativeness will positively predict innovativeness based self-esteem.

Hypothesis 2: Organization based self-esteem will positively predict innovativeness based self-esteem.

2.8.1.2 Learning Goal Orientation

VandeWalle (1993) raised the importance to study goal orientation in the domain of business and organizations. Goal orientation theory postulates for humans' inner motivation process that mirrors personality differences in outcomes like job and achievement-related behaviours (Albert & Dahling, 2016; Phillips & Gully, 1997; Zheng et al., 2019). Previously, goal orientation has not only been studied in employee performance and learning settings (e.g., Li & Tsai, 2020), nonetheless also has been adjoined to self-regulation behaviours (e.g., Ford, 1996; Wang, Yang, & Li, 2021). Zhang et al. (2020) cited that goal orientation is a motivational orientation encouraging employees

to participate in challenging work problems which could be based on either intrinsic task motivation or external factors like avoiding reproach or receiving awards.

Noordzij et al. (2013), and Alonso-Tapia and Herraiz (2021) mentioned that goal orientation is a personality trait reflecting a person's preference that may depend on situational topographies. They explained that trait goal orientation reflects individual's overall goal preferences those are steady over time and across various circumstances, whereas situational orientation epitomizes explicit goal preferences for tasks and is context specific. Zhang et al. (2020) reported that goal orientation was originally conceived as two-dimensional construct in literature (i.e., learning goal and performance goal), however, various scholars treated it as a three-dimensional construct (learning goal, performance-approach goal, and performance-avoidance goal) (Simamora & Mutiarawati, 2021; VandeWalle, 1997). Zhang et al. (2020) explicitly remarked that persons with high levels of learning goal orientation accentuate in developing their skills, improving knowledge, and competencies.

Literature has linked learning goal orientation with self-concept and its one element i.e., self-esteem (Albert & Dahling, 2016; Dweck & Leggett, 1988; Tuominen, Juntunen, & Niemivirta, 2020). For instance, Dweck and Leggett (1988) considered that learning goal may be a critical element of self-concept. Their influential research framework ponders learning goal orientation as a dispositional behavioural attribute of individuals which is

stable over time. They also accounted that the individuals scoring high on learning goal-orientation scale are apposite to exhibit high self-esteem. Alike, investigating association amid learning goal orientation and implied conceptions such as self-esteem, Button et al. (1996) ascertained a significant positive association. Conversely, VandeWalle (1997) stated that learning goal is a person's crave to learn novel skills, increase his competence level, and mastery on handling contingencies.

Concerning an individual's predilection in achievement settings, VandeWalle and Cummings (1997) associated learning goal orientation to three patterns. First, it persuades people to assess their abilities. Second, it indicates that the efforts made to develop ability will be successful. Third, people high in learning goal orientation engage in solution oriented self-instruction. It is obvious that all these patterns contribute to fulfil individual's need for self-esteem.

Teunissen and Bok (2013) found that self-esteem is positively associated to learning goals adoption. Likewise, Zhang et al. (2020) maintained that learning goal orientation plays an important role in synchronizing employees' concentration on work with their energies in firms which in turn positively affects the process of proposing innovative solutions to upgrade the products. Besides, studies elucidated that learning goal orientation implies employees' intentions to advance their capabilities, and stimulates them to attain novel knowledge and advance their skills. Employees scoring high on learning goal orientation scale unremittingly reconnoiter and

try several strategies to complete the assigned task, augment their learning abilities, and competencies (Kunst et al., 2018). Pertinently, Porath and Bateman (2006) reported that individuals scoring high on learning goal orientation scale are proactive, act as change agent, and conclusively perform tasks require in-role innovation. Literature shows that employees exhibiting in-role innovation are always high in self-esteem (Anwar, 2020; Munton & West, 1995). Following the presented theoretical contentions, the association between learning goal orientation and innovativeness based self-esteem (IBSE) may be hypothesized as following:

Hypothesis 3: Learning goal orientation will positively predict innovativeness based self-esteem.

2.8.1.3 Job Autonomy

Schwalbe (1985) cited that job experiences of personnel are frequently influenced by their self-evaluation. Though self-esteem represents an individual's subjective self-evaluation, is affected by workplace environment or work characteristics such as job autonomy (Krauss & Orth, 2021) which significantly contributes to carve attitudes, job-related behaviours, and motivations of employees (Hornung & Rousseau, 2007). Amabile et al. (1996) mentioned that employees make a psychological assessment of contextual factors in organizations; these contextual factors play an important role to determine the degree of novel and ingenious ideas origination. Organizational psychologists have identified that, among other environmental features, degree of freedom at work affects self-esteem of employees (Krause et al., 2019;

Mortimer & Lorence, 1979). Moreover, Hornung and Rousseau (2007) conjectured that autonomy orientation kindles inception of self-starting and proactivity-related actions. Literature echoes that autonomy at work leads to a greater degree of employee innovative work outcomes (Sipe, 2018). For instance, by exploring professionals working in high tech organizations, Chang and Cheng (2014) determined that job autonomy of subordinates contributed to their innovativeness.

Schwalbe (1985) highlighted that job autonomy influences self-esteem in three ways. First, self-perceptions urge people to take responsibility for their deeds and achievements. Second, reflected appraisals increase perception of autonomy. Third, social comparison as a status indicator in organizations develops autonomy. It is obvious that all the three factors contribute to self-esteem of employees. Kulik, Oldham, and Hackman (1987) identified the same aspect that job autonomy generates a feeling of personal responsibility among individuals for job outcomes. A study conducted by Janssen (2005) maintained that when workers believe that they have desired job control, they make serious efforts in producing, realizing and promoting innovative ideas for change. Hence, the presented standpoints are associated to autonomy at work encouraging human resource to become confident to accept a cross-section of assigned work functions and to exercise work autonomy to produce innovative work outcomes. Therefore, it can be inferred that the individuals high in personal innovativeness affected by job autonomy are further probable to manifest high degree of self-esteem (Goldsmith & Matherly, 1987; Lin & Filieri, 2015).

This study maintains that selection of job autonomy as a nomological to innovativeness based self-esteem (IBSE) is underpinned by the self-determination theory (SDT) because contemporary business scholars have extensively employed this metatheory to elucidate creative and innovative orientations of workforce (Martinaityte et al., 2019; Sipe, 2018). "For example, Patrick et al. (2007) applied self-determination theory to investigate relationship functioning and well-being of employees and found significant relationship between need for autonomy and need for competence with self-esteem. Likewise, Sipe (2018) exploited self-determination theory to evaluate what and how senior management contributes to enable innovative organizational competencies. The researcher applied psychological needs of relatedness and autonomy to develop a contextual model of innovative organizational capabilities. Besides, Krause et al. (2019) analyzed employees' motivation and well-being in education sphere underpinning their framework using self-determination theory. They realized that psychological needs of "competence" and "autonomy" are positively associated with employees' self-esteem. The above discussed theoretical proffers concerning job autonomy, personal innovativeness, and self-esteem lead to the conjecture that job autonomy may affect innovativeness based self-esteem (IBSE) of employees in organizational milieus.

Hypothesis 4: Job autonomy will positively predict innovativeness based self-esteem.

2.9 Theory of Interactionism

Behavioural theories like Behaviourism and Freudianism explain human's behaviour by considering them as an animal. These theories do not consider or explicate idiosyncratic social characteristics to explain human behaviour. For instance, Behaviourism poses that all human behaviours are caused by external stimuli or conditioning. This leads to the assertion that behaviour can be explicated without envisaging internal human emotions or cognitive states. Behaviourism sees human as a passive learner who only respond to environmental stimuli. Classical conditioning focuses on neutral stimulus, whereas operant conditioning emphasizes on reinforcements and sentences (Ralph, 1978; Vandbakk, Olaff, & Holth, 2020). On the other hand, Freudianism provides tortuous methods to understand human thoughts, actions, and interactions. Studies revealed that besides criticism on Freudianism, it is still important to learn contemporary issues in philosophy of minds, moral, and social theory (Neu, 1991; Yeung, 2021). However, Awan (2017) emphasized that to empathise unconscious of human being, both the unconscious and social context are important because major part of unconscious is shaped by social contexts. This directs to the assertion that both personal and social context are important to understand human behaviour.

Although Schneider (1983) is considered as pioneer of interactional psychology, this concept can be traced back to the classic framework for social behaviour analysis called "Lewin's Grand Truism" (Carlston, 2013).

Kurt Lewin asserted that individual behaviour is determined by personal and environmental factors. Mathematically,

$$B = f(P, E)$$

Where "B" is individual overt behaviour, "P" stands for causal factors that reside within individual, and "E" refers to causal factors that reside within the world/outside individual.

Carlston (2013) indicated that to understand the assertion of Lewin, it is necessary to grasp the doctrines of traits and situationism. Personality psychology construes human behaviour as a function of traits, emotions, attitudes, values, and motives. Traditionally, these behavioural dispositions are tapped by using a measurement instrument and then correlated with some criterion variable in a particular situation; the important point is, in such investigations, the environmental factors are considered as "noise". By contrast, conventional social psychology construes individual behaviour as a function of social environment. To assess individual behaviour, social psychologists manipulate certain aspects of social environment and then test the impact of this variable on some behavioural variable; in this method, usually human personality is treated as "noise". Carlston (2013) further confirmed that Bowers (1973) advanced the Lewin's work of interactionism and added that personal and environmental aspects intermingle with each other in various ways to determine behaviour. Mathematically,

$$B = f(P \times E)$$

The formula simply conveys that individual behaviour is a function of multiplicative personal and situational factors; personal and situational elements interact with each other to determine individual behaviour.

Schneider (1983) explicated human behaviour by focusing on control mechanism of behaviour. He tried to explore whether human behaviour is controlled internally or externally, or both. Famous theory of interactionism proclaims that persons, as agents of change, are influenced by predisposing contextual factors (Mosley & Laborde, 2016; Terborg, 1981). This view can be traced to interactional psychology (Schneider, 1983). Interactional psychology accentuates the importance of interaction between individuals and situations as empirically explored by McCormick et al., (2019), and Zhou and Shalley (2003). This steers to the proposition that mutual interaction between personal factors and contextual factors would impact individual innovative capabilities in organizational settings (Ford, 1996; McCormick et al. 2019; Oldham & Cumings, 1996).

The researcher proposed that learning goal orientation and job autonomy could be the potential antecedents to innovativeness based self-esteem (IBSE). Applying theory of interactionism, their interaction is expected to influence the innovativeness based self-esteem (IBSE). Nomological network creation section of present study indicates that the selected personal factor was learning goal orientation (VandeWalle, 2001), whilst contextual factor was job autonomy (Purc & Laguna, 2019). According to theory of interactionism, the interaction between stable dispositions and contextual cues

would play a decisive role in directing the innovative behaviour of employees (McCormick et al., 2019; VandeWalle & Cummings, 1997). This study tests the interactionism theory in the organizational settings, whether interaction between both personal and contextual factors impacts the outcome, this hypothesis is purported:

Hypothesis 5: Job autonomy will moderate the effects of learning goal orientation on innovativeness based self-esteem.

2.10 Predictive Validity

Predictive validity theory proposes to check ability of operationalization of a psychological construct to predict a criterion it should be able to predict theoretically (Trochim, Donnelly, & Arora, 2016). To achieve this objective, psychologists and organizational researchers usually correlate new traits with external criterion/ independent index, for example, psycho-physiological functioning, job performance or employee behaviour, to establish an evidence of predictive validity of newly proposed traits (Matthews et al., 2009; Niessen et al., 2018). Salkind (2010) expounded that predictive validity can best be manifested if the data tapped for a new trait measure significantly predict performance, though performance acts as a criterion. Applying the analogous method, predictive validity of innovativeness based self-esteem (IBSE) will be ascertained by correlating it with employees' innovative job performance (Rodrigues & Rebelo, 2019).

Rotundo and Sackett (2002) realised job performance as controllable actions and behaviours of employees that contribute to organizational objectives. Waldman and Spangler (1989) proposed individual characteristics, motivational factors, and ability as determinants of performance in their model. Job performance theories allude it as a function of motivation and ability (e.g., Judge, Erez, & Bono, 1998). Maslow's theory of motivation submits that self-esteem is a persuasive motivator of human behavior (Maslow, 1943), and personal innovativeness is an individual's ability to launch novel notions through out of box thinking and an idiosyncratic characteristic (Rogers, 2003), therefore, innovativeness based self-esteem (IBSE) could be assumed as function of job performance. In addition, Arnolds and Boshoff (2002) considered self-esteem as mediator between Alderfer need satisfaction and job performance in their theoretical model. They argued that people with positive self-esteem reflect high self-perceived competence, self-image, creativity, and success competency. They found that self-esteem has a significant influence on job performance. Similarly, self-consistency theory proposed by Korman (1970) suggests that employees perceive themselves as competent, qualified, and skilled for a specific job perform better in organizations. Akgunduz (2015) also confirmed that self-esteem positively predicts job performance.

This research also upheld the position that innovativeness based self-esteem (IBSE) should be confined within self-concept paradigm. Judge, Locke, and Durham (1997) mentioned that self-concept is a momentous antecedent to job related behaviours, job satisfaction, and job performance.

More specifically, Krauss and Orth (2021), and Bozani et al. (2020) report that self-esteem is positively associated to job satisfaction and job performance. This study will tap employees' innovative job performance because innovative job performance reflects employees' job performance in the context of innovative outcomes (Rodrigues & Rebelo, 2019). Based on these theoretical arguments the following hypothesis is proposed:

Hypothesis 6: Innovativeness based self-esteem will positively predict employee innovative job performance.

2.11 Theoretical Framework

Nomological network provides a theoretical framework for construct validation studies representing theoretical constructs called nomologicals and their relationship with "*a priori*" construct under investigation (Alotaibi, 2012). In addition, it also provides an empirical framework and links theoretical realm with empirical realm (Ralph & Tempero, 2018). Nomological network is a unique method introduced by Cronbach and Meehl (1955) to determine theoretical validity of *a priori* constructs. Both psychologists are considered as authority figures in the area of construct validity and reliability. The nomological network is unique per se because it constitutes a theory (Cronbach & Meehl, 1955) and provides *a priori* arrangement of constructs that furnishes theory building for *a priori* psychological constructs (Alotaibi, 2012).

It is worth mentioning that in section 2.7, the proposed three step approach towards getting a fully functional psychological construct, all the steps are independent of each other and rely on different theoretical considerations. In new construct validation studies, only nomological network provides the main *a priori* theoretical framework as suggested by Alotaibi (2012), and Cronbach and Meehl (1955).

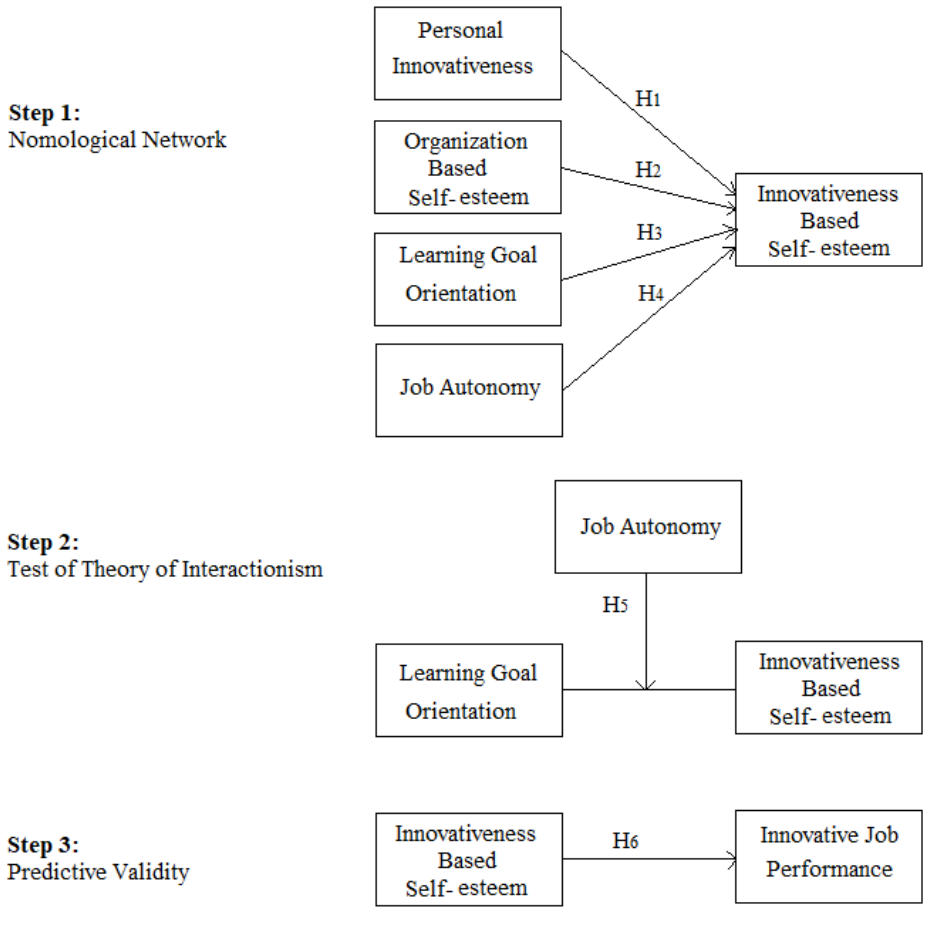


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Figure 2.4 Three Steps Theoretical Framework for Study

Figure 2.4 shows the theoretical framework of present study. In addition to nomological network of innovativeness based self-esteem (IBSE),

which provides a theoretical framework representing nomologicals and their relationships with innovativeness based self-esteem (IBSE), test of theory of interactionism and predictive validity have also been included.

2.12 Conclusion

This chapter provides a comprehensive review of literature on self-concept, self-esteem, personal innovativeness, underlying theories used to develop nomological network of innovativeness based self-esteem (IBSE), and definition of innovativeness based self-esteem. In addition, on the basis of previous studies, a stepwise approach to validate a psychological construct has been identified and implemented to validate innovativeness based self-esteem construct. It has also been discussed that how other researchers developed and interpreted the nomological networks they created to validate the constructs, previously. Further, rational to the test of theory of interactionism and predictive validity has also been provided.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter focuses on the philosophical assumptions of research, research process, and research design adopted to validate innovativeness based self-esteem construct. In addition, population and sample, data collection method, instruments, and data analysis techniques adopted by the study are also discussed. This chapter explicitly discusses the philosophical positions of contemporary scholars regarding the development of nomological network. This study adopts cross-sectional design to test nomological network, theory of interactionism, and predictive validity, however, time lagged design is used to estimate test-retest reliability of innovativeness based self-esteem (IBSE). To test the study hypotheses, data were collected from employees engaged in research and development (R&D) activities in selected science and technology (S&T) organizations of Pakistan.

3.2 Research Paradigm

Research paradigm, also called philosophy of research or philosophical assumptions, is considered as an important part of a research and, therefore, has been given due consideration in the literature (Andersen, Anjum, & Rocca, 2019; Baškarada & Koronios, 2018; Bryman, 2012). Guba (1990) classified research paradigm or philosophical assumptions of research through its

epistemology, ontology and methodology. This study endorses the importance of this philosophical concept because the design of any research experiment always starts with the selection of a specific research topic and a research paradigm (Creswell, 2003).

In the context of present research, epistemological and ontological assumptions are important to be discussed in detail because the development of nomological network relies on these assumptions. There exist two schools of thoughts pertaining to selection of nomologicals and function of nomological network. The first school of thought "positivism" focuses on epistemology assumption (Cronbach & Meehl, 1955; Matsuda et al., 2011). This school of thought believes that epistemology refers to seeking answer to what counts knowledge within this world (Cooksey & McDonald, 2011). Therefore, scholars who belong to this school of thought develop nomological network by considering construct validity specific to prototypical epistemological process of measurement. They consider relationships between nomologicals and the outcome variable in terms of their apparent meanings and associations (Borsboom et al., 2004).

However, the second school of thought "realism" believes in ontology and considers that an attribute must exist that should causally affect the outcome of measurement procedure (Borsboom et al., 2004; Tierney & Farmer, 2002). This school of thought assumes that ontology helps to make believe that something or a social phenomenon makes sense or is existent (Scotland, 2012). This school of thought emphasizes to develop nomological

network by emerging relationships between nomologicals and outcome variable with reference to a theory and in predictive manner (Borsboom et al., 2004; Ralph & Tempero, 2018).

Literature indicates that both school of thoughts have their own *pro et contra*. However, based on the significance of ontologically developed nomological network, it is plausible to follow the concepts of second school of thought i.e., "realism". Ontology perceives social entities as objective or subjective. Objectivism is also known as positivism, whereas subjectivism as also known as constructionism. Positivism refers to an ontological position maintains that existence of social phenomena and their meanings is real and independent of social actors. Conversely, constructionism portrays that crafting of social phenomena depends on perceptions and actions of social scientists concerned with their existence (Bryman, 2012). Positivism deals with numbers and figures and is used to quantify attitudes, behaviours, and opinions. In contrast, the objective of constructivism is to gain an in-depth knowledge of peoples' experiences, opinions, trends, and thoughts to better understand problem under investigation (Bryman, 2012).

This study adopts positivism (quantitative) ontological assumption because quantitative research focuses on developing hypotheses, correlating and linking variables to determine their degree of association, and/or the predictability/causality. The quantitative research technique has been adopted because this study attempts to validate a psychological construct. Literature shows that new or extended constructs can only be validated by testing these

constructs quantitatively on individuals serving in various work settings related to the scope of the study (Hoffman et al., 2015; Kakkar et al., 2016; Matsuda et al., 2011). Present research does not adopt qualitative research technique because testing nomological network for construct validity, testing theory of interactionism, and testing predictive validity are purely quantitative in nature (Shen et al., 2014; Tierney & Farmer, 2002).

Keeves (1997) noted that methodology assumption deals with the well-planned research design, methods, tactics, and processes used to test hypotheses. According to Guba (1990), methodology seeks to answer the question "how you go about finding it out?", and "how this research will proceed?" Methodology is always based on study's ontological assumptions like what is the reality of this research, and what is the research design of study? Methodology of a study directs on how to collect data? How to select sample? What instruments should be used? How to analyse the data? Present research adopts methodology assumption to plan and strengthen research design, methods, and processes used to test hypotheses proposed by this research.

3.3 Research Process

This section provides an overview of standard research process and informs about how each step is carried out in this study. The research process is depicted in Figure 3.1. The first step of research process is to understand and define problem the study is going to address. To define problem,

researchers need to include a clear statement about the existence of a problem with the supporting evidence. Fàbregues and Fetters (2019) suggested that problem is portrayed through research questions. Similarly, Graziano and Raulin (1993) mentioned that research question is an interrogative statement about anticipated relationships between variables and how they can be tested empirically. Based on the focus of research questions, researchers decide the nature of study i.e., descriptive, exploratory, hypothesis testing etc. Present research seeks to answer the question "how to assess construct validity of innovativeness based self-esteem?" To answer this question, a stepwise approach to validate a psychological construct has been reported based on analyses of related studies in similar domain (Hoffman et al., 2015; Kakkar et al., 2016; Matsuda et al., 2011; Shen et al., 2014; Tierney & Farmer, 2002).

The next step of research process requires to identify, and collect the literature dealing with the topic of the research. The review process includes identification of the relationships between variables and the related results from previous studies. The most important part of literature review is to critique previous literature on the topic under investigation. The task to critically evaluate the literature is the beauty of literature review. Tharenou, Donohue, and Cooper (2007) noted that the criticism could be substantive and methodological. A literature review has been conducted in this study to analyze how contemporary researchers have dealt with psychological construct validation. Based on the literature review, this study reported a stepwise approach to achieve a fully valid and functional construct.

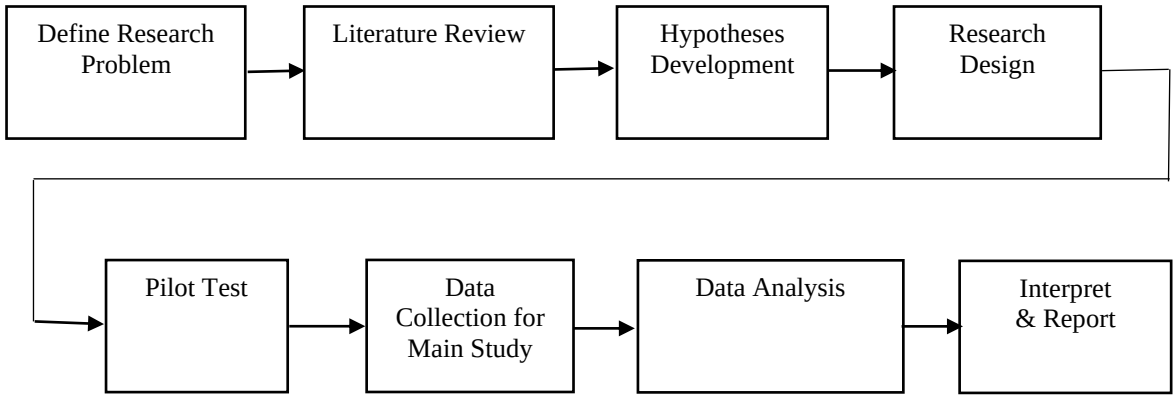

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Figure 3.1 Research Process

After successfully conducting the literature review, the next step is to formulate the hypotheses. Creswell (1994) mentioned that hypothesis is a statement that properly depicts relationship between independent and dependent variable. Allen (2017) elucidated that hypothesis explains phenomenon or predicts relationships between research variables. This study formulated the hypotheses by following the school of thought focuses on ontological philosophical assumption (Borsboom et al., 2004; Tierney & Farmer, 2002).

An overall strategy chosen by researcher based on the ontology assumption to assimilate various components of a study in a logical and intelligible way is referred to as research design of a study. Selection of an appropriate research design is vital to effectively address main research problem and research questions (Tharenou et al., 2007). Research design reflects the methods of data collection, measurement of constructs, and

analyses of data. Tharenou et al. (2007) mentioned that various research designs could be chosen by researchers based on ontology of research. Main types of designs include experimental design, quasi-experimental design, correlational/survey designs, case study-based designs, and action research. Present research adopted survey research design to ensure implementation of ontological assumption as already discussed.

To avoid instrumentation related problems, researchers advise to test reliabilities of all scales used in any study by conducting a pilot study (Cooper & Schindler, 2008). Following this notion, before collecting data for main study, a pilot test was conducted by collecting data from 40 subjects which was sufficient to estimate internal consistency of instruments tested in this pilot study (Hertzog, 2008). All the study variables were found reliable and appropriate to proceed further.

The next step in research process is to collect data to test main study hypotheses. For this purpose, first researcher needs to identify the target population for that study. Population of a study refers to a broader assembly of people to whom the study intends to generalize the results. The nature of population is dependent on the scope of study. To make inferences about population, statisticians collect sample from population. A sample is always a sub-set of population. To get proper results, sample size should be acceptable (Tharenou et al., 2007). Literature shows that researchers can select probability or non-probability techniques to select sample. The selection of sampling technique depends on the type of population and nature of research

study (Tharenou et al., 2007). The data used in social sciences are primary or secondary data. Primary data are collected by using questionnaires and constructs are tapped by using the scales. The present study validated innovativeness based self-esteem construct by testing individuals working in research and development (R&D) departments of selected science and technology (S&T) organizations in Pakistan by using convenience sampling technique.

In next step of research process, the collected data are screened for missing values, errors and other types of respondent biases. After removing erroneous entries, data are analyzed by applying various statistical techniques. Tabachnick and Fidell (2001) also called for testing data in the context of related statistical assumptions of General Linear Model (GLM). Generally, data analysis is divided in three types i.e., descriptive analysis, confirmatory analysis, and exploratory analysis. The statistical techniques like central tendency, dispersion, estimation, correlation, regression, ANOVA, MANOVA, MANCOVA etc. could be applied depending on the nature of framework and hypotheses. This study applied correlation, hierarchical linear regression, and moderation analysis techniques to analyze the data.

3.4 Research Design

This study employed a cross-sectional survey research design to collect data and test study hypotheses (external phase). However, a time lagged approach was adopted to estimate test-retest reliability of innovativeness based

self-esteem (IBSE) (structural phase) because it is a standard requirement to estimate test-retest reliability of new constructs to ensure their stability over time.

In cross-sectional studies, data are collected at a given point in time. These studies are based on data collected from sample which is representative of entire population (Kesmodel, 2018). Godlee (2019) explained that cross-sectional research design is commonly used in social sciences. It includes surveys, laboratory experiments, and prevalence studies. Kesmodel (2018) indicated that survey research design is preeminent to test attitudes, behaviours, and to know opinions of people. Godlee (2019) explicitly mentioned that cross-sectional research is most appropriate design for studies validating constructs, instruments, and questionnaires.

This research attempts to test nomological validity, theory of interactionism, and predictive validity of a newly proposed psychological construct “innovativeness based self-esteem” (IBSE). Literature suggests that cross-sectional research design is the most pertinent for such studies (Godlee, 2019). Literature also shows that similar construct validation studies widely adopted cross-sectional research design (Agarwal & Prasad, 1998; Hoffman et al., 2015; Kakkar et al., 2016; Matsuda et al., 2011; Shen et al., 2014; Tierney & Farmer, 2002).

To test the stability of an instrument over time, it is recommended to estimate test-retest reliability of a new instrument. Stability of an instrument

refers to the consistency and accuracy of a measure over two points in time (Matheson, 2019). To estimate test-retest reliability of a measure, it is essential to administer same instrument to same study subjects at two time points. For example, Schougaard, de Thurah, Bech, Hjollund, and Christiansen (2018) estimated test-retest reliability of Danish well-being index (DWBI) by collecting two data sets from study participants over a two-week interval. Similarly, Brailovskaia and Margraf (2018) demonstrated test-retest reliability of German single-item self-esteem scale (G-SISE) over a period of nine months.

Literature shows that acceptable time-interval to demonstrate test-retest reliability will vary depending on the nature of construct being measured, stability of construct, target population (Dutil, Bottari, & Auger, 2017) etc. Various studies investigating psychometric properties tested their instruments over two weeks (Schougaard et al., 2018), three weeks, eight weeks, ten weeks (Bryant & Harrison, 2018), three months (Wajda, Motl, & Sosnoff, 2016), six months (Donnellan, Trzesniewski, & Robins, 2015), nine months (Brailovskaia & Margraf, 2018) etc. Although target time of two weeks is a frequently recommended interval (Dutil, Bottari, & Auger, 2017), personality researchers advised to test the instruments over a longer period of time to achieve more reliable estimates (Seybert & Becker, 2019). Following accepted convictions to estimate test-retest reliability, the present study collected data for innovativeness based self-esteem (IBSE) from study subjects over a period of three months to get more reliable estimates (Seybert & Becker, 2019). In simple words, questionnaire tapping innovativeness based

self-esteem (IBSE) were first administered to study subjects at Time 1. The same study subjects were contacted again after three months (Time 2) to fill questionnaire tapping innovativeness based self-esteem (IBSE).

3.5 Population and Sample

Population refers to a group of individuals or objects from which study samples are drawn to measure different variables. Conversely, a sample is a finite fragment of a statistical population whose characteristics are examined to advance information about the whole population (Webster, 1985). In other words, sample refers to a set of respondents (individuals) selected from a bigger population. The population of this study consists of individuals working in organizations where innovation is required. Amabile (1996) affirmed that innovation is crucial to all organizations and jobs up to a certain extent. However, to validate innovativeness based self-esteem (IBSE), Siyanbola et al.'s (2011, p. 20) directions were followed. The researchers mentioned that:

> "Science and Technology (S&T) creates new knowledge; and knowledge is self-replicating as the more people have access to knowledge the more knowledge is produced. Most countries now devote an increasing proportion of their resources to S&T and associated research and development (R&D) in an attempt to build competitive advantage".

In addition, Siyanbola et al. (2011) also linked research and development (R&D) activities and its profitability with extent of its innovativeness. Hitherto, Daniels et al. (2007) also proxied innovation with research and development (R&D) activities. Since current study is related to innovativeness, the researcher kept in mind the stance of Siyanbola et al. (2011), and Daniels et al. (2007). Based on the importance of research and development (R&D) departments of science and technology (S&T) organizations, researcher of this study decided to validate innovativeness based self-esteem (IBSE) by sampling the employees working in research and development departments of selected science and technology (S&T) organizations in Pakistan. The sample was conveniently selected for administration of questionnaires.

Literature also reflects that similar type of studies validated creativity/innovativeness related constructs by testing individuals working on technical assignments. For instance, Agarwal and Prasad (1998) validated "personal innovativeness in information technology" (PIIT) construct by collecting sample from 175 employees working in United States based technology organizations. Likewise, Tierney and Farmer (2002) tested construct validity of "creative self-efficacy" by tapping responses from individuals (machinists, line operators, and technicians) serving in technical organizations in United States.

Following the similar approach, the researcher administered the surveys to 150 sampling elements (permanent employees i.e., engineers,

technologists, scientific researchers) working in research and development (R&D) departments of selected science and technology (S&T) organizations of Pakistan who are conveniently available to participate in study. This is clearly in line with the definition of "sampling elements" as mentioned by Lavrakas (2011, p. 52):

"Thus, the elements used in different surveys will depend on the purpose of the survey and may be adults, children, households, employees, businesses, students, teachers, schools, school districts, uniformed personnel, civilian personnel, police districts, libraries, books within libraries, pages within books, or many other things".

In summary, the sampling elements and unit of analysis for the present study were the individual employees working in research and development (R&D) departments of selected science and technology (S&T) organizations in Pakistan. This study intends to substantiate "innovativeness based self-esteem" construct which is specific to personal innovativeness and confined within self-concept theory. Literature on self-concept indicates that self-concept is extensively acknowledged and implemented theoretical reflection of individual's positive self-beliefs (Marsh et al., 2019). Hence, the analysis can only be conducted on individuals reflecting an extent of innovativeness based self-esteem (IBSE).

3.6 Sample Size

Tharenou et al. (2007) emphasized that in order to establish external validity the sample should unbiasedly represent the population so that the results of the study could not only be generalised to the study population but to external settings too. Although several researchers suggest statistical procedures to determine sample size for known population size, but only few discussed sample size calculation methods for unknown population size (Faul, Erdfelder, & Lang, 2007). It is important to mention that due to sensitive nature of the sample of current study, the information about the population size of this study is not publicly available. To cope with this issue, researcher decided to use G*Power sample size determination technique as suggested by Faul et al. (2007). Due to versatility, flexibility and user friendliness of G*Power software, it has become popular among contemporary psychologists and organizational researchers. Following Faul et al. (2007) directions, the sample size for this study was determined in the following way:

This study used G*Power software latest version (3.1.9.4) to determine sample size for the undetermined population size. To test nomological network, G*Power calculated a sample size of 108 individuals ($f^2 = 0.15$; type-I error < 0.05; power = 0.90; tested predictors/total predictors = 4; test = *f*-statistic/linear multiple regression: fixed model, R^2 increase; type of power analysis = *a priori*). To test theory of interactionism and predictive validity, G*Power calculated a sample size of 73 individuals ($f^2 = 0.15$; type-I error < 0.05; power = 0.90; tested predictors/total predictors = 1; test = *f*-

statistic/linear multiple regression: fixed model, R^2 increase; type of power analysis = *a priori*). Although G*Power calculated a sample size of 108 individuals, standard surveys were administered to 150 individual employees and their supervisors because chances of missing data, erroneous data, or non-response are always present. Administering more surveys than determined sample size is an effective way to cope with these issues.

3.7 Sampling Technique

This study employed convenience sampling technique for sample selection which is a type of non-probability sampling. The overall purpose of this study is to validate a newly proposed psychological construct. Literature indicates that construct validation studies are not interested to investigate probabilistic properties of population because such studies endeavour to explore dispositional characteristics of individuals (Moghadam et al., 2018; Tierney & Farmer, 2002). Therefore, such studies widely applied convenience sampling technique for sample selection (e.g., Agarwal & Prasad, 1998; Hoffman et al., 2015; Kakkar et al., 2016; Matsuda et al., 2011; Moghadam et al., 2018; Robertson, 2013; Shen et al., 2014; Tierney & Farmer, 2002). In addition, the nature of scientific and technological organizations in Pakistan is highly sensitive and it is almost impossible to find information about related human resource with the help of any published report, directory, or reference yellow pages. Questionnaires were dispensed to 150 employees (full-time/regular scientific researcher professionals, engineers, technologists) working in research and development (R&D) departments of science and

technology (S&T) organizations in Pakistan at Time 1 (t_1) (August, 2020). After three months (t_2) (December, 2020) same employees were contacted again to collect data to estimate test-retest reliability of innovativeness based self-esteem (IBSE).

To participate in this study, the job nature of respondents should be highly creative or innovative. Following the customary cultural and ethical research protocols (e.g., respondents rights and consent, anonymity, no harmful activities in study), 150 standard web-based surveys in English language were sent to study subjects and their respective supervisors after briefing them about the study objectives and details. The questionnaires were not needed to translate in vernacular because English is the office language of Pakistan.

3.8 Survey Questionnaire Development

This section presents essential information about instruments used to tap all constructs. Following sub-sections describe item generation, operationalization of variables, and structure of questionnaire.

3.8.1 Items Generation

All the scales used in this study were adopted because of their well-researched and established psychometric properties. However, the scale to tap innovativeness based self-esteem (IBSE) was developed by the researcher in a

former research project. The scale is titled as “Anwar’s Innovative esteem Scale (AIS)” (Anwar, 2020). The scales, their sources, items, and formats are provided in Table 3.1 and Table 3.2.

Table 3.1 Scales and Sources

Construct	Source
Organization Based Self-Esteem (OBSE)	Pierce et al. (1989)
Personal Innovativeness	Agarwal and Prasad (1998)
Learning Goal Orientation (LGO)	VandeWalle (1997)
Job Autonomy	Idaszak and Drasgow (1987)
Innovativeness based Self-esteem (IBSE)	Anwar (2020)
Innovative Job Performance	Welbourne et al. (1998)

Source: Established for this research

Table 3.2 Items and Format

Construct	Items	Format
Organization Based Self-Esteem (OBSE)	I count around here. I am taken seriously around here. There is faith in me around here. I am trusted around here. I am helpful around here. I am a valuable part of this place. I am efficient around here. I am an important part of this place. I make a difference around here. I am cooperative around here.	5-point Likert
Personal Innovativeness	I am interested in new ideas. I am interested in news that deals with new development in technologies or discovery. I am interested using new technologies. In general, I am falling behind other people in terms of accepting something new.	7-point Likert
Learning Goal Orientation (LGO)	I am willing to select to a challenging work assignment that I can learn a lot from. I often look for opportunities to develop new skills and knowledge. I enjoy challenging and difficult tasks at work where I'll learn new skills. For me, development of my ability is important enough to take risks. I prefer to work in situations that require a high level of ability and talent.	5-point Likert

Job Autonomy	I decide on my own how to go about doing the work. The job gives me a chance to use my personal initiative or judgment in carrying out the work. The job gives me considerable opportunity for independence and freedom in how I do the work.	7-point Likert
Innovativeness based Self-esteem (IBSE)	I feel contented when my ideas transform into reality. I am satisfied with my innovative kind of nature. I feel myself elevated when people talk about my organizational contributions. I feel ultimate satisfaction when people come to know about my new ideas.	7-point Likert
Innovative Job Performance	This employee is coming up with new ideas. This employee is working to implement new ideas. This employee is finding improved ways to do things. This employee is creating better processes and routines.	5-point Likert

Source: Established for this research

3.8.2 Operationalization of Variables

Basically, the items for current study's constructs were adopted from past studies. For example, organization based self-esteem (OBSE) was measured with 10 items of the Organization Based Self-Esteem Scale (OBSE) developed by Pierce et al. (1989). 5-point Likert format was used to tap responses (1= Strongly Disagree, 5= Strongly Agree). Pierce et al. (1989) reported reliability coefficient for the scale ranging from 0.86 to 0.96 in their study.

Personal innovativeness was measured with 4 items of The Personal Innovativeness Scale (PI) developed by Agarwal and Prasad (1998). 5-point Likert format will be used to tap responses (1= Strongly Disagree, 5= Strongly Agree). Agarwal and Prasad (1998) reported that reliability coefficient for the scale was 0.84 in their study.

Learning goal orientation was assessed with 5 items subscale of Goal Orientation Scale (GOS) developed by VandeWalle (1997). Responses were tapped using 5-point Likert format (1= Strongly Disagree, 5= Strongly Agree). VandeWalle (1997) reported reliability coefficient of 0.89 for learning goal orientation.

Job autonomy was tapped with 3 items subscale of the Job Diagnostic Survey (JDS) developed by Idaszak and Drasgow (1987). The adopted subscale assessed job autonomy using a 7-point Likert format (1=Very

Inaccurate, 7= Very Accurate). High scores on this subscale reflect high level of job autonomy. The reported reliability coefficients for job autonomy subscale ranged from 0.68 to 0.77 (Fields, 2002).

Innovativeness based self-esteem was assessed with 4 items Innovativeness based Self-esteem Scale (IBSE) (Anwar, 2018; Anwar, 2020). Responses were tapped on 7-point Likert scale (1= Strongly Disagree, 7= Strongly Agree). The scale was developed by carefully examining the literature on personal innovativeness (e.g., Agarwal & Prasad, 1998, Leavitt & Walton, 1975, 1981; Rogers, 2003) and self-esteem (e.g., Coopersmith, 1967; Rosenberg, 1965). The psychometric properties of scale were established with the help of an international expert panel confirmed the translation validity. Anastasi and Urbina (1997), Cronbach (1990), and Jensen (1998) suggested that a trait scale must satisfy three criteria i.e., validity (construct/predictive), reliability, and stability. This study satisfies these conditions because it will establish the evidence of validity, reliability (internal consistency), and stability (test-retest) of innovativeness based self-esteem (IBSE) in organizational settings (for more details please see Appendix-III).

Employee innovative job performance was measured with 4 items innovation sub-scale developed by Welbourne, Johnson, and Erez (1998). Supervisor rated, 5-point Likert format was used to tap responses (1 = Strongly Disagree, 5 = Strongly Agree). Welbourne et al. (1998) reported reliability coefficient of 0.90 for the employee innovative job performance scale.

This study includes control variables i.e., age, gender, education, and tenure into the regression model because many researchers believed that these variables may confound the relationship between independent variables and innovativeness/creativity related dependent variable(s) (Carnabuci & Diószegi, 2015; Tierney & Farmer, 2002).

3.8.3 Structure of Questionnaire

The questionnaire, that was filled by employees, consists of two sections. In section one, age, gender, education, tenure, and employee code were mentioned. Employees' email addresses were used as their codes to match the questionnaires filled by an employee and his respective superordinate. A statement, that is meant to inform the subjects that they are required to fill a second questionnaire at Time 2 (after 3 months), was also included. In section two, the employees were asked to report how they scale themselves for the mentioned questions. In this section the items capturing organization based self-esteem (OBSE), personal innovativeness (PI), learning goal orientation (LGO), job autonomy (JA), and innovativeness based self-esteem (IBSE) were mentioned in sequence with their respective response formats.

For supervisor rated questionnaire, there were also two sections. In section one, employee code was mentioned. Employee code was included to track the employees. In second section, the items tapping innovative job performance were listed along with their response format.

The study subjects were contacted again after three months to get their responses on innovativeness based self-esteem (IBSE). The web-based questionnaires were filled by employees, consist of two sections. In section one, employee code was mentioned. Employee code was included to track the employees only, whereas in section two items tapping innovativeness based self-esteem (IBSE) were listed along with their response format.

3.9 Data Collection Method

Following the standard cultural and ethical research protocols, 150 standard web-based surveys in English language were sent to study subjects via email at Time 1. The subjects were briefed about study objectives and details. Due to inevitable circumstance created by COVID-19 pandemic and worldwide travel and movement restrictions imposed by governments, it was not possible for the researcher to visit Pakistan for data collection. Hence, the data collection strategy was changed from personal level to web-based. For this purpose, Google Forms, which is a cloud-based survey administration software, was used for designing and developing web-based questionnaires. All study questionnaires are given in Appendix-V.

To identify available subjects during pandemic times and ensure their responses, a senior official of Ministry of Science and Technology was requested to propose homogenous organizations under their administrative control. Hence, 5 science and technology organizations with homogenous functional protocol were selected for data collection. Subjects, associated with

research and development (R&D) activities, were requested to complete and submit the questionnaires within reasonable time. In addition, subjects were asked to identify their supervisors and honestly request them to fill supervisory data. Supervisors were contacted by subjects themselves to fill innovative performance (IP) data for their subordinates. Due to closure of offices in pandemic times it was extremely difficult to contact supervisors directly by the researcher. At Time 2 (after 3 months), study subjects were contacted again to collect their responses pertaining to their level of innovativeness based self-esteem (IBSE) in order to ascertain that innovativeness based self-esteem is a stable construct over time.

3.10 Pilot Study

Statistics experts have recommended to conduct a pilot study before main data collection to ensure consistency of all the study scales. For example, Cooper and Schindler (2008) encouraged researchers to conduct pilot study to avoid future disaster like reconfiguration of scales or recollection of data. Hertzog (2008) suggested that a sample size of 25-40 respondents is ample to estimate internal consistency of instruments tested in a pilot study. By analysing results of pilot study, scholars can easily identify perplexing, offensive, or obstructive scale items that might confuse the main study's respondents in comprehending the item statements shown in the questionnaire.

Applying convenience sampling technique, 40 individuals working in research and development (R&D) domain of science and technology (S&T)

organizations in Pakistan were sampled. The respondents were first informed about nature and objectives of the study and were requested to carefully fill and submit the web-based questionnaire. Received responses were carefully entered in the SPSS software, after that sample descriptive statistics and scales' alpha reliabilities were computed. All the scales were found reliable due to their well-established psychometric properties evident in literature. The sampled subjects for pilot study were also included in main study sample as suggested by Thabane et al. (2010).

Table 3.3 Scales Reliabilities for Pilot Study

Constructs	**Cronbach Alpha**
Organization Based Self-Esteem (OBSE)	0.91
Personal Innovativeness	0.74
Learning Goal Orientation (LGO)	0.93
Job Autonomy	0.81
Innovativeness based Self-esteem (IBSE)	0.94
Innovative Performance	0.91

Source: Established for this research

3.11 Data Analysis

In this study, nomological network (external phase), interactionist perspective (external phase), and predictive validity (external phase) were examined by conducting Pearson product moment correlations, hierarchical linear regression, and moderation analysis. All the tests were conducted by using SPSS software.

Pearson product moment correlations technique is used to find the linear association among two variables. This association or relationship is reflected in correlation coefficient. There are many types of correlations coefficients calculation methods but Pearson product moment correlations is widely applied to estimate linear association among two variables (Edwards, 2019). This correlation coefficient is denoted by "*r*". The Pearson product moment correlations ranges from -1 to +1, whereas 0 means no correlation. -1 reflects perfect negative correlation, whereas +1 reflects perfect positive correlation between two variables (Tharenou et al., 2007).

The Pearson product moment correlations had been widely applied in academic and pragmatic research to find the degree of linear association among two variables (Edwards, 2019; Schober, Boer, & Schwarte, 2018) and to test nomological networks (Brown et al., 2018; Hartmut et al., 2019). In addition, Pearson product moment correlations technique is also suggested by scholars to estimate test-retest reliability for constructs over time (structural phase). To estimate test-retest reliability for a construct, the degree of linear

association between the scores tapped for same construct in two time points is estimated (Berchtold, 2016; Wahlsten, 2011). The value of correlation coefficient for test-retest reliability above 0.90 is considered as excellent, above 0.80 is good, and above 0.70 is acceptable (Aldridge, Dovey, & Wade, 2017).

Hierarchical linear regression was applied in this study to test the hypotheses related to nomological network and predictive validity. This method provides a unique way to enter the variables in blocks on theoretical basis. The most important feature of this regression is that researchers can enter demographic variables in a block to partial out their impact on dependent variable. In the next step, the job related or industry related variables can be entered in the model to partial out their impact on dependant variable. Another useful feature of this method is, researchers can easily calculate the change in variance due to each block of variables entered in the model (Tharenou et al., 2007). Hierarchical linear regression is very popular for theory driven research among contemporary psychologists, personality, and organization researchers (Bäcklander et al., 2019; Benito-Gonza´lez, 2018; Edwards, 2019), and to test ontology driven nomological networks (Tierney & Farmer, 2002).

The theory of interactionism that is tested in this research was confirmed by conducting Preacher and Hayes (2008) PROCESS moderation analysis method. This technique of moderation analysis is an extension of regression-based moderation (Hayes & Rockwood, 2017) with an addition of bootstrapping approach to increase the accuracy of analysis (Preacher &

Hayes, 2008). To test the regulatory effects, 5,000 bootstrap resampling with bias corrected and accelerated design was applied by setting a 95 percent confidence interval (Anwar, 2017).

Statistical analysis and econometric modelling can only produce accurate inferences if data under analysis met certain statistical assumptions (Gujrati, 2004). The most important assumptions to present study are called general linear regression model (GLM) assumptions. Among other GLM assumptions, present study particularly focused on independence, linearity, gaussianity, and multicollinearity. However, the most important GLM assumption for studies using either time lagged design or collecting sample at different levels is independence assumption which states that "all independent variables should be independent to each other". In simple words the assumption imposes a restriction of zero autocorrelation among the residuals of independent variables. The occurrence of violation of independence assumption can be minimised by drawing random sample, however, it increases if cross sectional data are collected using convenience sampling. Comparatively, the violation of autocorrelation assumption is marginal in cross-sectional data and more in time series data, particularly when the intermission between data collection time points is short as suggested by Anwar (2015). To detect any possible violation of independence assumption, the Durbin-Watson (DW) test statistic was estimated as advised by Gujrati (2004). Statistical literature submits that the DW test statistic greater than 2 and close to 0 signifies that independence of residuals assumption is not met. Meticulous statisticians also recommended that DW test statistic within range

of 1.5 to 2.5 is enough to get an evident of model independence (Anwar, 2015).

In addition to independence assumption which is particularly critical to present study, the linearity, gaussianity, and multicollinearity assumptions for regression model were also tested and presented in next chapter.

3.12 Conclusion

This chapter presented philosophical rational to ontologically developed construct validation studies in order to assimilate reality of research, research design, and their superiority over prototypical epistemological processes. In addition, this chapter discussed research process, research design, population and sample, sample size, sampling technique, and questionnaire development. The results of pilot study showed that all adopted scales were found internally consistent due to their well-established and documented psychometric properties. Finally, data analysis methods were discussed to test the nomological network, theory of interactionism, predictive validity, and test-retest reliability of innovativeness based self-esteem (IBSE).

CHAPTER 4

ANALYSIS AND RESULTS

4.1 Introduction

This chapter objectively presents the results of statistical analyses conducted on empirical data. Firstly, the data management has been staged which includes missing data, data accuracy, data entry, non-response bias, and common method bias. Secondly, data assumptions have been tested which include linearity, gaussianity, independence, and multicollinearity. Thirdly, data analyses section embraces descriptive statistics, correlations, validity, reliability, and test-retest reliability. Lastly, the results of hypotheses testing are presented which include the test of nomological network, test of theory of interactionism, and predictive validity. The chapter is concluded in the last section.

4.2 Data Management

In the business and management studies, the primary source of data is often self and/or supervisor rated questionnaires directly administered to sampled subjects targeted during the data collection phase of research studies. Questionnaires, as measuring instruments, are prone to human errors. *Ergo*, apposite data management is essential prior to data entry to ensure success and reproducibility of statistical analyses (Washington et al., 2001). Data management is a cardinal process which provides a roadmap furthering how to

handle and manage data. This process includes data storage, cleaning, and error reduction or elimination prior to data entry in statistical software. Tharenou et al. (2007) suggested that data should not be entered into any statistical program until researchers check and correct data pairing problems, deal with erroneous answers, and substitute or eliminate missing data.

With the advent of online survey management tools, data management has become drastically simple as compared to management of paper-based questionnaires. Due to the rise of Novel Coronavirus *vis major*, present study used Google Forms, which is a cloud-based survey administration software, to design and develop web-based questionnaires. Therefore, data management had become significantly straightforward and trouble-free.

4.2.1 Missing Data

Missing data are commonplace in business, management, and psychology research which refer to the responses on paper-based questionnaires left blank by respondents intentionally or unintentionally (Padgett, Skilbeck, & Summers, 2014). The effective handling of missing data is important to attain generalizable findings that contribute to reliable understanding of a phenomenon under study. Roth (1994) intimated that missing data in any dataset exceeding 10 percent of the overall sample will considerably reduce sample size hence produce erroneous outcomes. Occurrence of missing data can be avoided by structuring easy to understand, comprehensive, and short questionnaires. Researchers have devised various statistical and mathematical techniques to deal with missing data, for instance,

resampling cases with missing data, listwise deletion, pairwise deletion, mean substitution, full information maximum likelihood, and multiple imputation (Tharenou et al., 2007).

Fortunately, the application of online survey tools like Google Forms has completely eliminated the problem of missing data because researchers can enable the response validation by making required questions as mandatory entries marked with asterisks. Once the response validation feature is enabled, the software forces the respondents not to leave any field unfilled. If the respondent leaves any blank field intentionally or forget to enter, in whatsoever case, the software restricts the submission of questionnaire until mandatory fields are correctly filled. Utilizing the Google's online survey cloud technology, present study did not encounter the issue of missing data.

4.2.2 Data Accuracy

Tharenou et al. (2007) advised the researchers to ensure data accuracy before its entry into any statistical program. Responses to various sections of questionnaire must be cross-checked to partial out duplicate answers, intentional and unintentional errors in responses, and confusing answers. Tharenou et al. (2007) further mentioned that quality of data can be ensured by identifying and correcting wrong answers and missing data. Before data entry into any statistical software, it must be entered into a program like Excel to identify and correct all data related errors. Present study utilized Google Forms as data collection tool which intrinsically ensure the data accuracy by putting restrictions on missing data and other unintentional errors.

4.2.3 Data Entry

Data were entered into SPSS statistical program for further analysis. For this purpose, all conventional protocols were followed as suggested by Tharenou et al. (2007). First, variable view was designed by entering all the study variables into the view sheet and configuring their measurement properties. The data were coded numerically according to categorial or scale nature to facilitate the data analysis. It was ensured that no data were missing and all data were handled carefully in order to avoid complications in data analysis.

4.2.4 Non-Response Bias

In statistics, bias refers to any discrepancy between estimated survey statistic and actual population parameter (Bose, 2001). Non-response bias in survey research indicates the systematic disparity in characteristics between responders and non-responders (Sedgwick, 2014). For instance, if a researcher administers a survey to a cross-sectional sample of 300 subjects, he observes that only, let's say, 165 subjects responded to the survey (response rate= 55%). At this point a question arises, why 45 percent of the sample had not responded to the survey? This causes a serious problem for survey studies because non-response causes sample size reduction which in turn affects exactitude of population parameters (Panwar, Azfar, & Tanwar, 2018).

Cheung, ten Klooster, Smit, de Vries, and Pieterse (2017) reported that non-response may be correlated with general properties of study population. In

addition, they also narrated that senior citizens, females (including enceinte), and individuals with exceptional qualifications are prone to revert surveys. Moreover, over coverage, refusals, illness, and language barriers also contribute to non-response (Panwar et al., 2018). Sedgwick (2014) expounded that non-response bias is intricate to enumerate because information about non-respondents (properties, attitudes, intentions, and behaviours) is either not available or limited.

For present study, 150 online questionnaires were administered to study sample. Due to countrywide lockdown imposed by the government to cope with Novel coronavirus *vis major*, it was almost impossible to physically administer the surveys to sample and get responses. This situation had significantly increased the risk of non-response. Sedgwick (2014) cited that non-response bias can be minimised by increasing response rate. Therefore, the study subjects were specifically targeted and encouraged by a representative of their central controlling authority to respond to the surveys in order to augment the response rate. Eventually, this study pulled in 121 responses (response rate= 80.66) for final analysis that is above the basic sample size of 108 subjects calculated by using G*Power as shown in the previous chapter of this study (Faul et al., 2007).

4.2.5 Common Method Bias

Common method bias (CMB) is a consequent of common method variance (CMV) which is “variance that is attributable to the measurement method rather than to the constructs the measures represent” (Podsakoff,

MacKenzie, Lee, & Podsakoff, 2003: 879). Chang, Witteloostuijn, and Eden (2010) elucidated that chances of common method bias (CMB) are greater if explanatory and dependent variables are rated by same study subjects at once. Common method bias (CMB) produces inflated internal consistency because correlations among study variables would have caused by a common source.

Guide and Ketokivi (2015) cited that common method bias (CMB) is impossible to address in single-informant survey studies because informants are the source of bias and they cannot be tested statistically or otherwise. Literature exposits two procedural techniques to deal with common method bias (CMB) i.e., *ex-ante* and *ex-post*. *Ex-ante* techniques are preventive in nature and are applied in the early stage of survey design. In contrast, *ex-post* procedures are applied after data collection and comprise of statistical techniques to detect and/or attenuate the effect of common method bias (CMB) on internal consistency of constructs (Rodríguez-Ardura & Meseguer-Artola, 2020).

Statistical literature suggests that common method bias (CMV) can be belittled by encouraging the respondents' willingness to answer the survey and provide truthful, realistic, non-influenced responses, collecting data for explanatory and dependent variables from multiple sources (*ex-ante*) etc. (Rodríguez-Ardura & Meseguer-Artola, 2020). Contemporary methodologists pungently discouraged to apply non-inferential *ex-post* procedures like Harman's single factor post-hoc test (Guide & Ketokivi, 2015; Podsakoff et al., 2003). However, inferential *ex-post* procedures like discriminant validity

test suggested by Bagozzi, Yi, and Phillips (1991), confirmatory factor analysis (CFA) marker technique, and the latent method factor technique are fortified by contemporary methodologists (Guide & Ketokivi, 2015; Rodríguez-Ardura & Meseguer-Artola, 2020).

The problem of common method bias (CMB) has been dealt by strictly following *ex-ante* techniques followed by *ex-post* inferential discriminant validity test recommended by Bagozzi et al. (1991). The *ex-ante* technique was applied in the following manner: the study adopted self-rated method to tap explanatory variables and supervisor-rated method to tap employee innovative performance; study subjects were encouraged to willingly provide truthful, realistic, and non-influenced responses. Finally, *ex-post* inferential discriminant validity test (Bagozzi et al., 1991) was conducted as a safeguard measure to further detect influence of common method bias (CMB) on internal consistency of constructs. Bagozzi et al. (1991) suggested that common method bias (CMB) would be a detrimental issue only if the correlations among study constructs are greater than 0.90 ($r > 0.90$). The discriminant validity results show that all correlations among study constructs (Table 4.6) have values less than 0.90, therefore, common method bias (CMB) is not adversely inflating internal consistency of study variables.

4.3 Data Assumptions

The ultimate objective of social sciences research is to make inferences about population instead of simply obtaining mathematical approximations (Anwar, 2015). To achieve this objective, social sciences research deems

accuracy of the population regression function estimators. Population regression function is purely dependent on the stochastic disturbances, *ergo*, the stochastic disturbances need a thorough investigation before estimating the population regression function (Anwar, 2015). To achieve accurate population estimators, it is essential to test whether data hold certain assumptions called "Gaussian Linear Regression Model (GLRM) assumptions" (Gujarati, 2004).

Before testing the proposed hypotheses, GLRM assumptions of linearity, gaussianity, independence, and multicollinearity were investigated because these assumptions are particularly important to the ontological context of present study.

4.3.1 Linearity

This assumption focuses on parametric linearity of regression model and rejects the urban legend that the "conditional expectation function" (CEF) of regressand should only be a linear function of regressors. Econometric literature reasons that parametric linearity of the general regression model is duly required because linearity of regressand and regressors may be dependent on nature of the data, data structure, and the context (Gujrati, 2014). *Ergo*, this assumption holds that "conditional expectation function" (CEF) should be a linear function of general regression model estimators.

The linearity assumption for given regression model can be tested by using statistical and/or graphical methods. For instance, a variety of tests i.e., Eta test, mean procedure test (MPT), RESET test, curve fitting, comparison of

linear to non-linear variables etc. can be used to test linearity (Anwar, 2015). Following "keep it simple" principle, present study tested the linearity assumption of the regression model by conducting mean procedure test (MPT) in SPSS. First, independent and dependent variables were inserted in the analysis of variance (ANOVA) model and then the linearity test was performed. Table 4.1 shows the outcome of mean procedure test (MPT).

Table 4.1 Mean Procedure Test of Linearity

Variable Pairs	Condition	*SS*	*f-ratio*	*Sig*
IBSE*LGO	Combined	24.02	2.58	.001
	Linearity	16.15	36.54	.001
	Non-Linearity	7.86	0.88	.601
IBSE*PI	Combined	17.25	2.99	.001
	Linearity	9.02	32.91	.001
	Non-Linearity	8.23	1.50	.098
IBSE*JA	Combined	24.21	3.96	.001
	Linearity	9.06	4.33	.004
	Non-Linearity	2.14	0.82	.680
IBSE*OBSE	Combined	15.61	1.52	.001
	Linearity	6.98	17.00	.008
	Non-Linearity	2.63	0.75	.765

Source: Established for this research

LGO: Learning Goal Orientation; PI: Personal Innovativeness; JA: Job Autonomy; OBSE: Organization Based Self-Esteem; IBSE: Innovativeness Based Self-Esteem

To test linearity assumption, the mean procedure test (ANOVA) splits each combined group into their linear and non-linear constituents which makes it easy to diagnose incidence of non-linearity. Table 4.1 shows that for all pairs of variables, the *f*-ratio for linearity component is significant at .001, whereas, the *f*-ratio for non-linearity component is insignificant. These results show that the variables groups under analysis are linear, hence, the model significantly meets the parametric linearity assumption.

4.3.2 Gaussianity

Econometric literature suggests that the disturbances in the regression model should follow gaussian distribution in order to avoid wrong statistical inferences in hypothesis testing (Anwar, 2015; Gujarati, 2004). The theoretical rationalisation of gaussianity assumption is affirmed in the well-known "central limit theorem" (CLT) (Fischer, 2011). The theorem states that "the sum of large number of independent and identically distributed (*i.i.d*) random variables leads to gaussian distribution as the variables increase *ad infinitum*" (Anwar, 2015). Central limit theorem (CLT) asserts that dependent variable in a regression model is significantly influenced by stochastic disturbances. Moreover, Tharenou et al. (2007) cited that gaussianity assumption becomes more challenging when statistical inferences are made based on small or medium sized sample. They further suggested to test univariate gaussianity because multivariate gaussianity is intricate to test. If univariate gaussianity of regression model is affirmed, the chances of multivariate gaussianity violation are curtailed.

Present study tested the gaussianity assumption by calculating skewness and kurtosis of all variables entered in the regression model following the recommendation of Tabachnick and Fidell (2001). Ayentimi et al. (2013) expounded that skewness gauges an asymmetric distribution, whereas kurtosis measures flatness or peakedness of a probability distribution. The distribution could range from gaussian, positively skewed, negatively skewed, leptokurtic, to platykurtic distribution. Statisticians suggested that absolute values of skewness and kurtosis should be less than 2 and 5,

respectively (Kendall & Stuart, 1958). Strict statisticians like Garson (2012) do not recommend values of kurtoses beyond +3 to -3 range. The results obtained for skewness and kurtosis are shown in Table 4.2. Results show that the absolute values of skewness for all study variables are less than 2, whereas the absolute values of kurtoses for all study variables are less than 5. Thus, the gaussianity assumption for the study variables has successfully fulfilled.

Table 4.2 Test of Gaussianity

Variables	Skewness	Kurtosis
IBSE	1.00	0.13
LGO	1.20	0.72
PI	1.92	2.96
JA	0.78	0.66
OBSE	1.57	1.47

Source: Established for this research

LGO: Learning Goal Orientation; PI: Personal Innovativeness; JA: Job Autonomy; OBSE: Organization Based Self-Esteem; IBSE: Innovativeness Based Self-Esteem

4.3.3 Independence

Gaussian linear regression model (GLRM) assumes independence of all regressors included in the regression model. Simply speaking, there should be zero autocorrelation among the disturbances. Literature shows that probability of dependence among regressors is lesser in randomly sampled cross-sectional data and increases if non-random sampling is applied because non-random data may exhibit “spatial dependence” among regressor variables (Anwar, 2015). Contrary to this, the problem of dependence will become graver in the case of time series data, particularly when the gap between data collection time points is short.

Independence of the residuals assumption was examined for present study by estimating Durbin-Watson statistic as advised by Gujrati (2004). The Durbin-Watson statistic is estimated by using studentized random errors. Gujrati (2004) recommended that the value of Durbin-Watson statistic should always be either less than 2 but not near to 0 to satisfy independence of the residuals assumption. Though, the statistic scores near 2 indicate that the model satisfies the residuals independence assumption (Anwar, 2015). Statisticians advocating statistical precision endorse that Durbin-Watson coefficient should lie within the range of 1.5-2.5 to confirm model residuals independence (Glen, 2016). A Durbin-Watson statistic of 1.87 was computed for main regression model of present study which showed that the variables are independent of each other and regression model do not reflect any indication of dependence.

4.3.4 Multicollinearity

Multicollinearity insinuates an absolute linear relationship among few or all regressor variables in a regression model (Gujrati, 2004). The assumption urges that if few or all regressors are perfectly or highly correlated then model estimators will have large or infinite disturbances which will lead to inaccurate and imprecise model estimators (Anwar, 2015). Literature reports that erroneous data collection, misspecified models, overly determined models, model constraints, and common trend sharing among time series regressors are important causes of multicollinearity (Montgomery & Peck, 1982).

The detection of multicollinearity has been widely discussed in literature. Tharenou et al. (2007) and Kline (2005) suggested that variance inflation factor (VIF) and tolerance (TOL) values should be determined to detect multicollinearity. They recommended that variance inflation factor (VIF) should be less than 10 and tolerance (TOL) should be greater than 0.10 to satisfy the assumption of no multicollinearity. In contrast, numerous strict statisticians recommended that variance inflation factor (VIF) should be less than 4 and tolerance (TOL) should be greater than 0.25 to ensure that regression model does not violate the assumption of multicollinearity (Garson, 2012; Gujrati, 2004). For present study, the estimated values of VIF and TOL for all regressors lie below the specified threshold levels, therefore, no indication of multicollinearity was observed in the regression model. The collinearity statistics for current study are reported in Table 4.3.

Table 4.3 Collinearity Statistics

Variables	VIF	Tolerance
LGO	1.18	0.84
PI	1.26	0.79
OBSE	1.16	0.85
JA	1.12	0.92

Source: Established for this research

LGO: Learning Goal Orientation; PI: Personal Innovativeness; JA: Job Autonomy; OBSE: Organization Based Self-Esteem

4.4 Data Analysis

4.4.1 Descriptive Statistics

Total 150 valid web-based questionnaires were disseminated to study sample, whereas 121 responses were received back and available for final

analysis (response rate = 80.66%). The descriptive statistics tabulated in Table 4.4 show that 27.30 percent subjects were aged between 25-30 years, 34.70 percent subjects were aged between 31-40 years, 19.80 percent subjects were aged between 41-50, and lastly, 18.20 subjects were aged between 51-60. 64.50 percent subjects were male, whereas 35.50 percent subjects were females.

As far as academic profile of subjects is concerned, 1.70 percent subjects hold an Associate Degree (in technology), 45.50 percent subjects hold a Bachelor's Degree (in engineering/technology), 3.60 percent subjects hold Master's Degree, whereas 22.30 percent subjects hold Doctorate Degree.

Table 4.4 Descriptive Statistics of Sample

Demographics	Frequency	Percentage
Age		
25-30	33	27.3
31-40	42	34.7
41-50	24	19.8
51-60	22	18.2
Gender		
Male	78	64.5
Female	43	35.5
Education Level		
Associate Degree	2	1.70
Bachelor's Degree	55	45.5
Master's Degree	37	30.6
Doctorate Degree	27	22.3
Tenure		
1-5	38	31.4
6-10	36	29.8
11-15	20	16.5
16-20	11	9.1
≥ 21	16	13.2

Source: Established for this research

31.40 percent subjects were working in their respective organizations from 1-5 years, 29.80 percent subjects were working in their respective organizations from 6-10 years, 16.50 percent subjects were working in their respective organizations from 11-15 years, 9.10 percent subjects were working in their respective organizations from 16-20 years, and lastly, 13.20 percent subjects were working in their respective organizations from 11-15 years.

Table 4.5 Descriptive Statistics of Variables

Variables	Minimum	Maximum	Mean	Standard Deviation
LGO	1	5	3.78	0.75
PI	1	5	4.09	0.60
JA	1	7	4.87	1.07
OBSE	1	5	4.07	0.43
IBSE	1	7	5.41	1.02
IJP	1	5	3.60	0.90

Source: Established for this research

LGO: Learning Goal Orientation; PI: Personal Innovativeness; JA: Job Autonomy; OBSE: Organization Based Self-Esteem; IBSE: Innovativeness Based Self-Esteem; IP: Innovative Job Performance

Table 4.5 presents descriptive statistics of variables employed in this study. Learning goal orientation (LGO) [M=3.78, S.D=0.75], personal innovativeness (PI) [M=4.09, S.D=0.60], organisation based self-esteem (OBSE) [M=4.07, S.D=0.43] , and innovative job performance (IJP) [M=3.60, S.D=0.90] were tapped using 5-points Likert type response format, whereas job autonomy (JA) [M=4.87, S.D=1.07] and innovativeness based self-esteem (IBSE) [M=5.41, S.D=1.36] were tapped using 7-points Likert type response format.

4.4.2 Correlation Matrix

Correlation matrix is a way to explicitly show the linear association among study variables. Pearson product moment correlations were estimated to find the linear association among the variables used in current study. Literature suggested that Pearson product moment correlation ranges from -1 to +1; 0 means no correlation, -1 means perfect negative correlation, whereas +1 reflects perfect positive correlation between two variables (Tharenou et al., 2007). Pearson product moment correlations are extensively applied in academic and pragmatic research to find the degree of linear association among two variables (Edwards, 2019; Schober et al., 2018). In addition, correlations are extensively recommended by epistemologists to test the nomological networks (Brown et al., 2018; Hartmut et al., 2019).

The bivariate relationships shown in the Table 4.6 imply interim support to hypotheses 1-4 which are related to nomological network. The correlation between organization based self-esteem (OBSE) and innovativeness based self-esteem (IBSE) is 0.48 which is positive and significant at 0.05 level ($r = 0.48$, $p < 0.01$); the correlation between personal innovativeness (PI) and innovativeness based self-esteem (IBSE) is 0.45 which is positive and significant at 0.01 level ($r = 0.45$, $p < 0.01$); the correlation between learning goal orientation (LGO) and innovativeness based self-esteem (IBSE) is 0.33 which is positive and significant at 0.01 level ($r = 0.33$, $p < 0.01$); the correlation between job autonomy (JA) and innovativeness based self-esteem (IBSE) is 0.19 which is positive and significant at 0.05 level ($r = 0.19$, $p < 0.05$). These results provide provisional support to the

theoretical patterns proposed in the nomological network. It can be seen that the bivariate linear association between innovativeness based self-esteem (IBSE) and employee innovative performance (IP) is 0.63 which is positive and significant at 0.01 level (r = 0.63, p < 0.01). This provides an interim support to hypothesis 6.

Table 4.6 Correlation Matrix

	1	2	3	4	5
LGO	1				
PI	0.31**	1			
JA	0.25**	0.27**	1		
OBSE	0.33**	0.34**	0.11*	1	
IBSE	0.26**	0.45**	0.19*	0.48**	1
IJP	0.52**	0.56**	0.31**	0.41**	0.63**

Source: Established for this research
*p <.05; **p<.01

LGO: Learning Goal Orientation; PI: Personal Innovativeness; JA: Job Autonomy; OBSE: Organization Based Self-Esteem; IBSE: Innovativeness Based Self-Esteem: IP: Innovative Job Performance

4.5 Validity

This study strove to establish theoretical construct validity of innovativeness based self-esteem (IBSE) by developing a nomological network and studying its agreement with empirical data (Borsboom et al., 2004). In addition, predictive validity (a type of criterion related validity) was also tested by correlating innovativeness based self-esteem (IBSE) with employee innovative performance (external criterion) (Matthews et al., 2009; Niessen et al., 2018). Furthermore, literature suggests that measurement validity of new constructs should also be explored (Trochim et al., 2016). Therefore, two types of measurement validities (criterion related validities)

i.e., convergent validity and discriminant validity were tested for innovativeness based self-esteem (IBSE).

Trochim et al. (2016) stated that convergent validity refers to measures of constructs that should be related to each other theoretically, in fact, are related to each other empirically. Similarly, discriminant validity refers to "measures of constructs that should not be related to each other theoretically, in fact, are not related to each other empirically". To estimate the degree to which any two measures are related or unrelated to each, literature typically recommends to use the correlation coefficients (Trochim et al., 2016).

Theoretically, organization based self-esteem (OBSE) and innovativeness based self-esteem (IBSE) both are domain specific self-esteems (Anwar et al., 2020; Anwar, 2020), *ergo*, both constructs should be related to each other (Trochim et al., 2016). Table 4.6 shows the correlation between organization based self-esteem (OBSE) and innovativeness based self-esteem (IBSE) which is 0.48 and significant at 0.01 level. This medium level correlation coefficient (Jackson, 2006) provides the evidence of convergent validity of innovativeness based self-esteem (IBSE) because both constructs that should be related to each other theoretically, are in fact related to each other empirically.

The discriminant validity of the construct was assessed by looking at correlation between innovativeness based self-esteem (IBSE) and job autonomy (JA). Theoretically, innovativeness based self-esteem (IBSE) is a

"domain specific self-esteem" (Anwar et al., 2020; Anwar, 2020), whereas job autonomy is a work condition or characteristic (Krauss & Orth, 2021). Both constructs are distinct from each other. Trochim et al. (2016) elucidated that the relationship between measures from different constructs should be very low to establish an evidence of discriminant validity for a particular construct. Table 4.6 shows that the correlation between innovativeness based self-esteem (IBSE) and job autonomy (JA) is 0.19 (significant at 0.05 level) which is a low correlation according to Jackson (2006). Therefore, innovativeness based self-esteem (IBSE) has reflected discriminant validity as proposed by validity theory (Trochim et al., 2016).

4.6 Reliability

The term reliability in research context means "repeatability" or "internal consistency" of a measure. A measure is considered internally reliable if it would capture same construct consistently over and over again (Trochim et al., 2016). In social and behavioural sciences research, Cronbach's alpha (Cronbach, 1951) has been widely used to estimate internal consistency of measures (Bonett & Wright, 2004). A measure can only be considered reliable if the estimated reliability coefficient ranges from 0.70 to 0.95 (Nunnally & Bernstein, 1994; Tavakol & Dennick, 2011). All the measures applied in present study are found reliable because the suggested values of Cronbach's alpha coefficient lie within the acceptable range as shown in Table 4.7.

Table 4.7 Reliability of Measures

Variables	Cronbach alpha
LGO	0.85
PI	0.73
JA	0.84
OBSE	0.78
IBSE	0.94
IJP	0.89

Source: Established for this research

LGO: Learning Goal Orientation; PI: Personal Innovativeness; JA: Job Autonomy; OBSE: Organization Based Self-Esteem; IBSE: Innovativeness Based Self-Esteem: IP: Innovative Job Performance

4.7 Test-Retest Reliability

To test the stability of innovativeness based self-esteem (IBSE) over time, the test-retest reliability was estimated as suggested in literature (Brailovskaia & Margraf, 2018; Matheson, 2019). Stability of an instrument over time refers to the consistency and accuracy of a measure over two points in time (Matheson, 2019). To achieve this objective, the survey tapping innovativeness based self-esteem (IBSE) was administered to study subjects over a period of three months (Wajda et al., 2016). In simple words, questionnaire tapping innovativeness based self-esteem (IBSE) was administered to study subjects at Time 1 (t_1). The same study subjects were contacted again after three months i.e., at Time 2 (t_2) to fill the same questionnaire tapping innovativeness based self-esteem (IBSE). Literature suggests that the value of correlation coefficient for test-retest reliability above 0.90 is considered as excellent, above 0.80 is good, and above 0.70 is acceptable (Aldridge et al., 2017). For current study, the estimated coefficient

of test-retest reliability was 0.88 which is considered as a good indicator of stability of innovativeness based self-esteem (IBSE) over time.

4.8 Hypotheses Testing

In this section, the results of hypotheses testing are objectively presented. Firstly, the results of hypotheses related to nomological network are mentioned. Secondly, the result of hypothesis dealing with theory of interactionism is reported. Thirdly, the objective result of hypothesis for predictive validity is presented.

4.8.1 Nomological Network

In the correlation matrix sub-section, correlation results have been discussed which provide full support to Hypotheses 1 to 4 epistemologically and interim support to Hypotheses 1 to 4 ontologically. Now the results of hierarchical regression analysis have been presented below. In the first step of the analysis, control variables (i.e., age, gender, education, tenure) and dependent variable i.e., innovativeness based self-esteem (IBSE) were entered in the hierarchical regression model. In the second step independent variables i.e., personal innovativeness (PI), organization based self-esteem (OBSE), learning goal orientation (LGO), and job autonomy (JA) were entered into the model, then model was executed. The overall regression model was significant (f (120) = 8.84, $p < 0.001$).

Hypothesis 1 stated that "personal innovativeness will positively predict innovativeness based self-esteem". The hierarchical regression result indicates that personal innovativeness (PI) (β = 0.35, p < .001) significantly predicted innovativeness based self-esteem (IBSE). Hypothesis 2 stated that "organization based self-esteem will positively predict innovativeness based self-esteem". The hierarchical regression result indicates that organization based self-esteem (OBSE) (β = 0.39, p < .001) significantly predicted innovativeness based self-esteem (IBSE). Hypothesis 3 stated that "learning goal orientation will positively predict innovativeness based self-esteem". The hierarchical regression result indicates that learning goal orientation (LGO) (β = 0.29, p < .001) significantly predicted innovativeness based self-esteem (IBSE). Hypothesis 4 stated that "job autonomy will positively predict innovativeness based self-esteem". The hierarchical regression result indicates that job autonomy (JA) (β = 0.19, p < .05) is a statistically significant predictor of innovativeness based self-esteem (IBSE). Hence, these results completely supported hypotheses 1 to 4. Furthermore, 34 percent variance was explained by the model with the control variables group explaining 2 percent of the model variance and the block of nomologicals explaining 32 percent of the model variance. The results of the hierarchical regression analysis are presented in Table 4.8.

Table 4.8 Results of Regression Analysis for Innovativeness Based Self-Esteem[a]

	IBSE		
Predictors	*B*	R^2	ΔR^2
Step 1			
Control variables[b]		.02	
Step 2			
PI	.35***		
OBSE	.39***		
LGO	.29***		
JA	.13*	.34	.32***

Source: Established for this research
[a] n = 121, [b] Control Variables (Age, gender, education, tenure)
***p < .001; *p < .05
LGO: Learning Goal Orientation; PI: Personal Innovativeness; JA: Job Autonomy; OBSE: Organization Based Self-Esteem; IBSE: Innovativeness Based Self-Esteem

4.8.2 Theory of Interactionism

The hypothesis proposed following theory of interactionism stated that "job autonomy will moderate the effects of learning goal orientation on innovativeness based self-esteem". To test this hypothesis, PROCESS moderation analysis method was used as suggested by Preacher and Hayes (2008) which is a regression-based moderation (Hayes & Rockwood, 2017) with an addition of bootstrapping approach to increase the accuracy of moderation analysis (Preacher & Hayes, 2008).

To test the moderation effects, dependent variable innovativeness bases self-esteem (IBSE), independent variable learning goal orientation (LGO), and moderator job autonomy (JA) were inserted in PROCESS moderation window. 5,000 bootstrap resampling with bias corrected and

accelerated design were applied by setting a 95 percent confidence interval (Anwar, 2017). After this basic setup, the analysis was executed. The results are shown in Table 4.9.

Table 4.9 Results of Moderation Analysis[a]

	Coefficient	S.E.	*t*-statistics	*p*-value	LLCI	ULCI
Constant	2.9105	1.2223	2.3097	0.0012	1.4907	7.3118
LGO	0.2748	0.6227	3.2878	0.0154	0.7085	1.7581
JA	0.1490	0.4632	2.0333	0.0501	0.7383	1.0763
Interaction	0.1194	0.1269	1.9920	0.0432	0.1818	0.3207

Source: Established for this research

[a] n = 121

LGO: Learning Goal Orientation; JA: Job Autonomy; DV: Innovativeness Based Self-Esteem

The overall moderation model was significant (f (117) = 12.67, p < 0.0001). The results reflect that the interaction between learning goal orientation (LGO) and job autonomy (JA) is significant (coefficient=0.1194, p < 0.0432) and moderating effect lay between lower level confidence interval (LLCI) of 0.1818 and upper level confidence interval (ULCI) of 0.3207. Since zero does not lie inside the 95 percent confidence interval, we can conclude that the job autonomy (JA) moderated the relationship between learning goal orientation (LGO) and innovativeness based self-esteem (IBSE). Hence, theory of interactionism is proved for innovativeness based self-esteem (IBSE).

4.8.3 Predictive Validity

The predictive validity was substantiated by correlating innovativeness based self-esteem (IBSE) with employee innovative job performance, where, employee innovative job performance is considered as external criterion (Rodrigues & Rebelo, 2019). Although correlation method is sufficient to establish an evidence of predictive validity of a construct epistemologically, this study ascertained the predictive validity ontologically by conducting hierarchical regression analysis.

The correlation between innovativeness based self-esteem (IBSE) and innovative performance (IP) is 0.63 (see Table 4.6) which is positive and significant at 0.01 level (r = 0.63, p < 0.01). In addition, the results of hierarchical regression analysis are presented in Table 4.9. In the first step, innovative performance (IP) (dependent variable) and organization based self-esteem (OBSE) were entered into the regression model. In the second step, innovativeness based self-esteem (IBSE) was entered into the regression model. It is worth nothing to mention that inclusion of organization based self-esteem (OBSE) was not required to test hypothesis 6, which states that "innovativeness based self-esteem will positively predict employee innovative job performance", organization based self-esteem (OBSE) was included in regression model to test the effect of innovativeness based self-esteem (IBSE) beyond organization based self-esteem (OBSE). Finally, the model was executed. The overall regression model was significant (f (120) = 75.02, p < 0.001). The impact of innovativeness based self-esteem (IBSE) is significant

on innovative performance (β = 0.45, p < .001). Besides that, overall model explained 39 percent variance, with the organization based self-esteem (IBSE) explaining 16 percent of the variance and innovativeness based self-esteem explaining 23 percent of the variance. The results provide full support to hypothesis 6. The results of the hierarchical regression analysis are presented in Table 4.10.

Table 4.10 Results of Regression Analysis for Innovative Performance

		IJP	
Predictors	***B***	***R^2***	***ΔR^2***
Step 1			
OBSE	.33**	.16	
Step 2			
IBSE	.45***	.39	.23***

Source: Established for this research

[a] n = 121

***p < .001; **p < .01

OBSE: Organization Based Self-Esteem; IBSE: Innovativeness Based Self-Esteem: IP: Innovative Job Performance

4.9 Conclusion

This chapter presented the post-data collection stage which includes data management, data assumptions, descriptive statistics, validity, reliability, and test-retest reliability. The hypotheses testing results objectively report the outcome of test of nomological network, theory of interactionism, and predictive validity. All the hypotheses proposed by this study are proved empirically. In upcoming chapter, the results will be discussed subjectively in accordance to related theories applied to develop study hypotheses.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Introduction

This chapter delves into meanings, importance, and relevance of the results of present study objectively presented in previous chapter. More formally, the empirical results are linked to the study hypotheses proposed after literature review, further, the results are coupled to research questions to let readers know how the research questions have been answered. Specifically, subjective interpretations of results, research implications, and limitations and future directions are presented in this chapter.

5.2 Discussion

This study attempted to validate a newly proposed psychological construct titled “innovativeness based self-esteem” (IBSE). Present section subjectively discusses the objective empirical results of the study presented in previous chapter. First, the results pertaining to nomological network are discussed. Second, the empirical outcome concerning the theory of interactionism is discussed. Third, the discussion is made about the predictive validity of the innovativeness based self-esteem (IBSE). Fourth, relevant discussion is presented dealing with construct stability. All the results are discussed in the light of underpinned theories and reviewed literature along with proper justifications. To instigate better insights from study results, the

empirical results are linked to the study research questions and hypotheses (Annesley, 2010) to let the readers better understand how main problem of validating a newly proposed psychological construct titled "innovativeness based self-esteem (IBSE)" is resolved.

5.2.1 Construct Validity

In order to test the theoretical validity of innovativeness based self-esteem (IBSE), two research questions have been proposed in the first chapter. **First research question** stated that "What are the potential antecedents/nomologicals to innovativeness based self-esteem?", whereas **second research question** averred that "Is innovativeness based self-esteem a valid construct within a nomological framework?" Both research questions belong to "external phase" of the new construct development process prescribed in the Standards of Educational and Psychological Testing (2014) as affirmed by Flake et al. (2017). It is pertinent to mention that formation of nomological network to achieve theoretical validity of innovativeness based self-esteem (IBSE) covered both theoretical and empirical realms (Borsboom et al., 2004; Cronbach & Meehl, 1955). Hitherto, the theoretical realm has already been demarcated in literature review.

The answer to the first research question has been provided in detail in literature review where selection of personal factors i.e., personal innovativeness, organization-based self-esteem, learning goal orientation, and contextual factor i.e., job autonomy have been conjectured theoretically,

whereas the second research question has been partially answered in literature review. Based on theoretical underpinnings drawn from self-esteem theory, Maslow's theory of motivation, self-determination theory, and goal orientation theory, the personal and contextual nomologicals were theoretically placed in the nomological network and hypothesized to be valid antecedents to innovativeness based self-esteem (IBSE).

In order to ascertain hypothesized nomological relationships, the empirical realm has been probed and outcomes have been objectively reported in previous chapter. Drawn from Kirton's adaption-innovation theory (Goldsmith & Matherly, 1987), it was hypothesized that personal innovativeness would positively predict innovativeness based self-esteem (IBSE). The empirical results exposit that personal innovativeness is not only correlated to innovativeness based self-esteem (IBSE) epistemologically but also predicts it ontologically. The empirical results are in line with the theoretical considerations discussed in the hypothesis development section of this study. From the theoretical perspective, innovativeness based self-esteem (IBSE) is a domain specific self-esteem confined within self-concept paradigm (Anwar et al., 2020), whereas Maslow's theory of motivation propounds that individuals high in innovativeness and creativity ascertain augmented self-esteem level as compared to individuals low in innovativeness and creativity (Madsen & Wilson, 2012). In addition, personal innovativeness is a theoretical correlate of innovativeness based self-esteem (IBSE) (Anwar, 2020), therefore, it must reflect a degree of variation with innovativeness based self-esteem (IBSE). The results of nomological network indicate that the

theoretical and empirical realms are well matched because personal innovativeness is not only associated with innovativeness based self-esteem (IBSE) epistemologically but also predicted it ontologically. Hence, results of the first hypothesis support the assertion that innovativeness based self-esteem (IBSE) is a theoretically valid construct.

The second hypothesis of this study upheld that organization based self-esteem (OBSE) would positively predict innovativeness based self-esteem (IBSE). The empirical results showed that organization based self-esteem (OBSE) is correlated to innovativeness based self-esteem (IBSE). This satisfies the condition to obtain epistemological nomological validity as ascertained by Posey et al. (2015). Moreover, the regression results established that organization based self-esteem (OBSE) significantly predicted innovativeness based self-esteem (IBSE). Hence, the condition of ontological nomological validity has also been satiated. From the theoretical standpoint, innovativeness based self-esteem (IBSE) is a domain specific self-esteem (Anwar et al., 2020), analogously, organization based self-esteem (OBSE) is also cited as domain specific self-esteem (Gardner & Pierce, 2015). In addition, both self-esteems are confined within self-concept paradigm (Anwar, 2020; Anwar et al., 2020). The results of second hypothesis coincide with the above-mentioned theoretical position. Furthermore, organization based self-esteem (OBSE) is an innate theoretical correlate of innovativeness based self-esteem (IBSE) thus both self-esteems should not only be related to each other epistemologically, but organization based self-esteem (OBSE) should predict innovativeness based self-esteem (IBSE)

ontologically. Hence, empirical results harmonize with the theoretical position of second hypothesis. This provides an evidence that second hypothesis is well matched to empirical realm and supported.

The third hypothesis pertaining to the nomological network proposed that learning goal orientation would positively predict innovativeness based self-esteem (IBSE). This ontological speculation was underpinned applying two theoretical vistas. First, being a dispositional work characteristic, learning goal orientation not only sways employees to dilate avenues for innovative *chefs-d'oeuvre* (Hornung & Rousseau, 2007), but it also helps to empathize behaviour of employees (Dweck & Leggett, 1988). Second, learning goal orientation is pondered as an imperative determinant of individual's self-concept (Albert & Dahling, 2016), therefore, literature testified that learning goal orientation is positively associated with self-esteem (Button et al., 1996). The proposed hypothesis got the empirical support because learning goal orientation was not only related to innovative based self-esteem (IBSE) epistemologically but also predicted it ontologically. Therefore, on the basis of empirical outcomes for the said hypothesis, the empirical patterns are well matched with the theoretical pattern postulated in literature review. Hence, the empirical outcomes provide good support to third hypothesis.

The fourth and last hypothesis pertaining to nomological network posited that "job autonomy will positively predict innovativeness based self-esteem (IBSE)". The postulated relationship is rooted in theoretical proposition that employee autonomy orientation is always positively related to

self-esteem (Krause et al., 2019). This proposition is backed by self-determination theory (SDT) insinuated by Deci and Ryan (2000). The theory sees autonomy as an important human need that should be satisfied in order to perform better. The significant contentment of need for autonomy not only ameliorates wellbeing of employees, but leads to high self-esteem. This in turn enables innovative organizational capabilities (Sipe, 2018). The empirical results disposed that job autonomy is correlated to innovativeness based self-esteem (IBSE). In addition, it also predicts innovativeness based self-esteem (IBSE), providing support to fourth hypothesis of nomological network. The empirical outcomes displayed a well match between theoretical and empirical realms. Therefore, it is concluded that the results provide upright support to fourth hypothesis of this study.

5.2.2 Theory of Interactionism

In order to test the theory of interactionism for innovativeness based self-esteem (IBSE), **third research question** was formulated stating "Will the relationship between personal factor (learning goal orientation) and innovativeness based self-esteem be influenced by contextual factor (job autonomy) to satisfy theory of interactionism?" This research question fits to the "external phase" of the new construct development process as asserted by present study. As a result of literature review, a hypothesis, "Job autonomy will moderate the effects of learning goal orientation on innovativeness based self-esteem (IBSE)", was proposed. The hypothesis was underpinned by the theory of interactionism (Carlston, 2013). The theory criticizes the extant

theories of Behaviourism and Freudianism because they do not provide a comprehensive framework to understand human behaviour. For instance, Behaviourism sees human behaviour as a result of external stimuli (Ralph, 1978), whereas Freudianism explains human thoughts, actions, and interactions to understand behaviour (Neu, 1991). Psychologists have castigated both Behaviourism and Freudianism because these theories do not take personal factors and context into consideration to explain how human behaviour is shaped (Awan, 2017). Hitherto, Schneider (1983) deeply studied the drawbacks and limitations of theories explaining human behaviour and formed a contemporary field of psychology titled "interactional psychology". The corpus of "interactional psychology" is rooted in the theory of interactionism which postulates that individual's behaviour can be determined by taking personal and environmental or contextual factors into account. Therefore, to satisfactorily explain human behaviour, both doctrines of traits and situationism are cardinal to be studied and how their interaction shapes human behaviour (Carlston, 2013).

Personality psychology construes human behaviour as a function of traits, emotions, attitudes, values, and motives (Carlston, 2013), however, interactionist psychology explores internal and external factors controlling human behaviour (Schneider, 1983). The proponents of interactionist perspective argue that human beings, being agents for change, are influenced by contextual factors as suggested by Mosley and Laborde (2016), which signifies the interaction between person and situation to formulate human behaviour. Following theory of interactionism, present study hypothesized that

job autonomy (contextual factor) may interact with learning goal orientation (personal factor) to determine innovativeness based self-esteem (IBSE). This postulation was also backed by the contention that interactive effect of individual and contextual factors supports personal innovativeness in organizations (Ford, 1996; McCormick et al. 2019). The empirical results provided ample support to fifth hypothesis of this study because job autonomy significantly moderated the effect of learning goal orientation on innovativeness based self-esteem (IBSE).

On the basis of empirical findings, it can be concluded that the test of the theory of interactionism has been found valid for innovativeness based self-esteem construct. Following the position of interactionist psychology, innovativeness based self-esteem (IBSE) will be affected by multiplicative personal and contextual factors.

5.2.3 Predictive Validity

Predictive validity of new traits is considered as a very important criterion-related validity needs to be established before a new construct would be shelved in the library of psychological constructs for further adoption and application (Niessen et al., 2018). The theory of validity pays special consideration to the predictive validity, a type of criterion-related validity, to ensure that a construct under experiment is correlated to an independent index such as employee job performance, employee behaviour, or psycho-physiological functioning (Matthews et al., 2009; Niessen et al., 2018). In

order to test predictive validity of innovativeness based self-esteem (IBSE), **fourth research question**, “Does innovativeness based self-esteem achieve a good predictive validity?”, was formulated. This research question corresponds to the “external phase” of the new construct development process as averred by present study. In response to this research question, after conducting apposite review of literature, a hypothesis, “innovativeness based self-esteem will positively predict employee innovative job performance”, was proposed.

Although epistemological testing of new construct is theoretically sufficient to establish an evidence of predictive validity, present study designed hypothesis pertaining to predictive validity following ontological propositions (Borsboom et al., 2004). To propose validity hypothesis, employee innovative job performance was chosen as an independent index due to following theoretical reasons: first, motivation and ability of employees are considered having strong impact on the job performance of employees according to job performance theories (e.g., Judge et al., 1998). Self-esteem and personal innovativeness can be theoretically determined as the function of motivation and ability. For instance, primarily, positive self-esteem strongly motivates human behaviour (Maslow, 1943), whereas personal innovativeness is an individual characteristic reflecting individual’s aptitude to launch novel ideas by thinking outside the box (Rogers, 2003). Thus, mathematically, innovativeness based self-esteem (IBSE) could be considered as a function of job performance. Underpinned by given theoretical position, literature

suggests that self-esteem positively predicts job performance (Akgunduz, 2015; Korman, 1970).

This study tapped employees' innovative job performance because literature considered it as a more effective performance outcome measurement for innovative work assignments (Rodrigues & Rebelo, 2019). Second, present study undertook the position that innovativeness based self-esteem (IBSE) could be classified within self-concept paradigm. Following accepted conventions in literature, the present study contemplated that innovativeness based self-esteem (IBSE) would be associated to the employee innovative job performance because self-concept is an important antecedent to job oriented behaviours, employee job satisfaction, and employee job performance (Judge et al., 1997). Specifically, Erez and Judge (2001), and Judge and Bono (2001) found that self-esteem is positively associated with employee job satisfaction and job performance. Based on these theoretical assertions, hypothesis to test predictive validity of innovativeness based self-esteem construct was proposed. The empirical results displayed that innovativeness based self-esteem (IBSE) is significantly related to employee innovative job performance, both epistemologically and ontologically. Hence, the evidence for predictive validity of innovativeness based self-esteem (IBSE) has been demonstrated.

5.2.4 Construct Stability

The **last research question** proposed by this study stated that "Is innovativeness based self-esteem scale stable over time?" This

research question accords with the “structural phase” of the new construct development process as asserted by present study. Due to the methodological nature of this research question, it was not theoretically hypothesized. Reliability theory urges that new instrument capturing any psychological construct must tap consistent and accurate information over time (Matheson, 2019). The evidence of stability over time can be obtained for a measure by administering it to same study subjects at two time points (Schougaard et al., 2018). Testing reliability of an instrument over time is called test-retest reliability. Following similar theoretical and methodological conventions, questionnaire tapping innovativeness based self-esteem (IBSE) was administered to study subjects over two time points and then both aggregate responses were correlated to determine the level of test-retest reliability (Aldridge et al., 2017). The empirical results showcased that instrument tapping innovativeness based self-esteem (IBSE) was found significantly stable over time following the suggestion of Aldridge et al. (2017). *Ergo,* it can be concluded that research question pertaining to stability of innovativeness based self-esteem (IBSE) was substantially addressed.

Finally, all research questions along with the respective hypotheses are tabulated to recapitulate overall study in Table 5.1.

Table 5.1 Research Questions and Hypotheses: A Recap

Research Questions	Study Hypotheses	Results
1. What are the potential antecedents/nomologicals to innovativeness based self-esteem? (External phase).	No hypothesis is required for this question. Nomologicals are identified in literature review.	Four Nomologicals were identified from literature.
2. Is innovativeness based self-esteem a valid construct within a nomological framework? (External phase).	1. Personal innovativeness will positively predict innovativeness based self-esteem. 2. Organization based self-esteem will positively predict innovativeness based self-esteem. 3. Learning goal orientation will positively predict innovativeness based self-esteem. 4. Job autonomy will positively predict innovativeness based	1. Supported 2. Supported 3. Supported 4. Supported

	self-esteem.	
3. Will the relationship between personal factor (learning goal orientation) and innovativeness based self-esteem be influenced by contextual factor (job autonomy) to satisfy theory of interactionism? (External phase).	5. Job autonomy will moderate the effects of learning goal orientation on innovativeness based self-esteem.	5. Supported
4. Does innovativeness based self-esteem achieve a good predictive validity? (External phase).	6. Innovativeness based self-esteem will positively predict employee innovative job performance.	6. Supported
5. Is innovativeness based self-esteem scale stable over time? (Structural phase).	No hypothesis is required. Methodological question.	IBSE scale found stable over time.

Source: Established for this research

5.3 Implications

Research implications are considered as crux of a research showing how the study findings are important for theory, practice, and methodology (Koh, Rubenstein, & White, 2015). For present study, conclusions drawn from empirical results are mapped on theory, practice, and methodology to recommend specific actions to be taken for subsequent research. Thus, theoretical, practical, and methodological implications are rendered.

Introducing new psychological constructs is regarded as a top-level theoretical contribution according to taxonomic literature (Colquitt & Zapata-Phelan, 2007; Svejvig, 2021). The intent of present study was to validate a newly proposed psychological construct labelled "innovativeness based self-esteem" (IBSE) which offers implications for self-concept theory, self-esteem theory, and personal innovativeness theory. Heretofore, to the best of researcher's knowledge and literature reviewed, none of the studies explored personal innovativeness applying self-concept theoretical paradigm to figure out or examine the existence of innovativeness specific self-evaluations within individuals. The presented psychological concept is *sui generis* because it exhibits characteristics and competences manifested by individual's innovativeness specific views and evaluations about himself (Anwar et al., 2020). Thus, theoretically, innovativeness based self-esteem (IBSE) portrays it as a domain specific, confined within self-concept paradigm, and performance based construct (Anwar, 2020). Of course, these manifestations can urge personality psychologists and innovation theorists to contemplate on the underpinned theories.

Introducing a new prospect of domain specific self-esteem, explicitly emerged due to the personal innovativeness of employees, will indubitably enrich the existing knowledge on "how innovative individuals evaluate themselves and how this positive evaluation boosts individual's performance outcomes?" Since, every organization requires innovative outcomes (e.g., scientific, research, and development) to sustain and outperform, top managers should not only focus on innovativeness specific self-evaluative capabilities of their middle and line management, but they should consider innovativeness based self-esteem (IBSE) of their workforce, along with other dispositional factors, directly dealing with innovative solutions to augment organisation's product line and profitability. Organizations interested to explore various individual characteristics to fathom innovativeness dynamics may implement self-concept to an employee group to explain individual innovative behaviour and cross compare the performance outcomes of employee group without self-concept implementation. In addition, both public and private sector organizations may objectively explore innovative specific self-esteem orientation of their employees working on innovation-specific tasks to enhance the innovative outcomes and productivity. Hitherto, Anwar (2017) construed that employees who score high on creative self-efficacy could better perform creative or innovative organizational tasks, conversely, present research deems that employees scoring high on innovativeness based self-esteem (IBSE) could performed innovative task more efficiently and effectively.

Present research overtures significant methodological implications as well. For instance, previous studies dealing with new construct development or validation provided only murky insights regarding the procedure to introduce a new psychological construct. The reviewed literature, for instance, Hoffman et al. (2015), Kakkar et al. (2016), Matsuda et al. (2011), Shen et al. (2014), and Tierney and Farmer (2002), objectively applied the techniques needed to achieve a fully operational construct but these studies do not provide theoretical justifications of using the validation procedure and application of theories working behind the validation techniques. As mentioned in the literature review, the Standards of Educational and Psychological Testing (2014) was the first-ever document formally explaining new psychological construct development and validation. Subsequently, Flake et al. (2017) further simplified the procedure holistically. In contrast, present study solemnised new construct validation procedure as a stepwise approach and positioned nomological network development, testing theory of interactionism, predictive validity, and construct stability as essential constituents to achieve a fully operational psychological construct. Moreover, the study added value to Flake et al. (2017) by suggesting that construct stability should be the part of structural phase of new construct development process. Furthermore, this study placed predictive validity procedure under the external phase which was not actually suggested by Flake et al. (2017). The reason to do so lies under the placement of nomological validity within criteria related validity scheme as suggested by Flake et al. (2017); predictive validity having the same nature of validity, it seemed rational to put predictive validity under the parasol of the external phase of new construct development process.

Furthermore, the study capitalized on the "realism" school of thought which emphasizes on ontological development of study hypotheses and related analytical methods (Borsboom et al., 2004; Tierney & Farmer, 2002) instead of prototypical epistemological processes (Cooksey & McDonald, 2011). The ontological roots of study confer it with prevailing believe regarding the social phenomenon under consideration makes sense or is existent (Scotland, 2012). Also, the application of "realism" philosophical paradigm ensures that the conjectures of study hypotheses are entrenched with reference to theory and in predictive manner (Ralph & Tempero, 2018). Therefore, the ontological application on theoretical and methodological aspects of current study not only strengthen it philosophically but also paves the way to select appropriate analysis techniques. For instance, theoretically, a correlational study is sufficient to validate a psychological construct, but present study further tested the hypotheses in predictive fashion incorporating incremental validity of study constructs.

5.4 Limitations and Future Directions

In social sciences research, how carefully the theoretical framework is developed or methodology is executed, nevertheless, all social studies are prone to some limitations. Besides the ontological orientation and its related strengths, obviously, there are some limitations pertaining to present study addressed in this section. Studies applying time lagged design to either verify or endorse the findings or test the stability of constructs over time require great deal of time to collect the sample data. In addition, scholars cannot control various happenings taking place between the study lagged time points.

The study subjects may alter their qualitative responses with the passage of time due to their behavioural or observational tunings. Therefore, data reliability could be questioned in certain studies where the behavioural or observational adjustments are more frequent. This, however, has limited application to studies exploring dispositional tendencies or traits of individuals.

Present study explicitly investigated employees of R&D departments of science and technology (S&T) organizations working on innovative scientific tasks, the study results may be circumspectly generalised to other industrial sectors where either innovation is less focused or nebulous. Moreover, the differences between product innovation and service innovation should also be kept in mind because the contextual factors and antecedents may vary as per type of innovation requirements of various sectors in industry.

Besides the significance of study results for R&D segment of science and technology organizations, the nomological framework and contextual factors must also be tested for other industrial sectors like manufacturing, financial institutions, pedagogical institutes, and service sector to test the impact of individuals' innovativeness based self-esteem (IBSE) on their innovative performance outcomes. Furthermore, if future researchers are interested to study probabilistic characteristics of sample, in addition to individual characteristics, random sample could be helpful to further clarify the empirical upshots of this study.

It is recommended to explore how other contextual factors, for instance, supportive leadership, organizational climate, transformational leadership etc. and personal factors, for instance, entrepreneur orientation, social networking skills, individual problem-solving style etc. impact the innovativeness based self-esteem (IBSE) of employees in scientific and/or corporate settings. Besides, future studies may explore the jingle-jangle fallacies pertaining to innovativeness based self-esteem (IBSE) and the relationship between innovativeness based self-esteem (IBSE) with other prevalent individual/firm level creativity oriented psychological constructs such as core self-evaluation, self-evaluated creativity, creative personality, and creative self-efficacy could also be reconnoitred.

5.5 Conclusion

The last chapter of present study provided a holistic view on the study results and discussed the empirical outcomes in the light of underpinned theories and reviewed literature. The empirical patterns have reflected a considerate match with the theoretical conjectures developed in nomological network. Hence, the first and second objectives of this study i.e., “To identify the antecedents (nomologicals) to the innovativeness based self-esteem. (External phase)”, and “To establish construct validity of innovativeness based self-esteem. (External phase)” have been achieved. Similarly, the hypotheses developed to test “the theory of interactionism and predictive validity” were also substantiated empirically. This leads to the position that innovativeness based self-esteem (IBSE) is not only a valid psychological construct but also stable over time. Therefore, the third, fourth and fifth objectives i.e., “To test

theory of interactionism for innovativeness based self-esteem. (External phase)", "To test the predictive validity of innovativeness based self-esteem. (External phase)", and "To establish test-retest reliability of innovativeness based self-esteem. (Structural phase)" have also been successfully attained. Furthermore, related theoretical, practical and methodological implications of present research were discussed in detail. At last, the limitations of this study were presented and future direction to extend this study were provided so that researchers may set their developmental research pertaining to innovativeness based self-esteem (IBSE), its antecedents, contextual influences, fallacies, and relationship with related constructs.

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Appendix-I

Goldsmith and Matherly Framework

A framework published by Goldsmith and Matherly (1987) in Journal of Social Psychology gained extensive acceptance from psychologists, organizational researchers, educationists, and social scientists. The researchers investigated link between self-esteem and innovation by correlating Rosenberg self-esteem scale (RSS) and adjective check list (ACL) with Adoption-Innovation Inventory (Kirton, 1976). They established their position by arguing that Adoption-Innovation theory has a strong standing in terms of its nomological network related to abilities, cognitive styles and personality traits. They cited that adopters may be different from innovators because innovators are more extravagant, tolerant and flexible. The authors also cited previous studies showing consistent positive relationship between innovation and self-esteem for samples taken from American populace.

Kirton (2003) cited that Adoption-Innovation theory was founded on the postulation that every person solves problems effectively and is creative. However, the way of solving problems can be different. Adoption-Innovation construct delineates that the problem-solving approach of a person could be tapped by labelling one side of continuum as adopter and the other side as innovator. Kirton's Adoption-Innovation theory deals with cognitive styles of individuals and determine how people solve their problems. Kirton describes adopters as people who like to do works better, and innovators as individuals do things differently.

Rosenberg theory of self-esteem delineates self-esteem as stable sense of self-worth within individual (Minev et al., 2018). Rosenberg, in fact, reincarnated the self-esteem concept and is widely accepted by researchers in the fields of social psychology, personality and individual behaviour, and organizational behaviour. Flynn (2003) cited that Rosenberg theory of self-esteem manifests two components i.e., reflected appraisals and social comparison. Reflected appraisals describe that people see themselves from prospective of other people, whereas social comparison mean that they evaluate themselves by comparing them with other people. These reflected appraisals and social comparisons lead to positive/negative self-esteem. To explore the association between innovativeness and self-esteem, Goldsmith and Matherly (1987) correlated Kirton Adoption-Innovation inventory with two operationalizations i.e., Rosenberg self-esteem scale and Adjective Check List (ACL) and found significant association between innovativeness and self-esteem. However, they made no efforts to explore "why innovative people tend to exhibit high self-esteem and evaluate themselves better as compared to people low in innovativeness".

Appendix-II

Jingle-Jangle Fallacies

At this point, it is important to highlight conceptual differences between innovativeness based self-esteem and other related constructs such as creativity, innovativeness, and creative self-efficacy. Despite the importance and increasing research on creativity, Welsch (1980:3) confessed that "task of defining the concept of creativity is a challenging one". Similarly, Ebert (1994) mentioned that definitions of creativity are specific to particular authors than a matter of agreement among authority figures in the domain. Similarly, Amabile, Hill, Hennessey, and Tighe (1994) confirmed that there exists no unequivocal and generally accepted definition of creativity in the literature. However, literature synthesis suggests the consensus of researchers on terms like "original and useful" in the definition of creativity (Barron, 1955: 553; Mumford, 2003: 110; Ochse, 1990: 2; Plucker, Beghetto, & Dow, 2004: 90; Simonton, 1999: 5). In addition, Rhodes (1987) cited that creativity may refer to persons, products, services, environmental presses and organizations (Amabile, 1997). Amabile and her co-authors (1996: 1155) explicated that creativity is "a necessary but not sufficient condition" for innovation. Klein and Knight (2000) further elaborated that without adequately creative ideas, there would be no progress. Similarly, without effective implementation, the innovative idea fails to have an impact. Since employee creativity is not an implementation oriented construct, several intellectuals like Mumford (2003), and Zhou and Shalley (2003) have called to extend the construct to devote more scientific attention to the implementation

of creative ideas. Innovation theory explicitly stressed that innovation is broader than creativity and includes implementation of creative ideas (King & Anderson, 2002). In a related study, Getz and Robinson (2003) reveal that eighty percent of the ideas in workplaces are introduced by employees. However, employees are rarely encouraged by employers to innovate or explicitly rewarded for innovative behaviour (George & Brief, 1992). In the scientific literature, individual innovation is considered as a purely discretionary/extra role behaviour (Katz & Kahn, 1978). Schuler and Jackson (1987) pointed out that motivating individual innovative behaviour may lead to the benefits like employee recognition and possibility to expand his/her skills, which could be resulted in feelings of enhanced personal control, morale and a stronger commitment to self and job. Kanter (1988), and Gong, Kim, Lee, and Zhu (2013) explicitly stated that innovation and creativity are different things. They consider innovation as integration of idea generation and idea implementation. To measure creativity, Torrance (1974) quantified creative thinking by including fluency, flexibility, originality and elaboration dimensions. Careful study indicates that creative thinking dimensions deal around ideas and totally miss the application and exploitation of these ideas. In the view of Leavitt and Walton (1975, 1993), innovativeness considers recognition and application of ideas than the creation of ideas themselves. Based on the literature review, researcher of this study see creativity as an individual's ability to create new and useful ideas about products, processes, systems etc. (thinking something new, imaginative, non-quantifiable), whereas individual's innovativeness deals with unexpected and novel stimuli and its implementability on the existing products, processes, and systems for the

purpose of value addition to existing products, processes or systems (introducing something new, productive, quantifiable).

Like creativity is frequently confused with innovativeness, Gist and Mitchell (1992) indicate that self-esteem is also recurrently confused with self-efficacy. They mentioned that "self-esteem is considered to be an individual's characteristic reflecting effective evaluation of the self (e.g., feeling of self-worth or self-liking). By contrast, self-efficacy is judgement about a task capability that is not inherently evaluative" (p.185). For instance, a mechatronics engineer may have very low self-efficacy pertaining to ball dancing, but it does not result in low self-esteem because it does not weaken his/her overall evaluation and feelings about the self. In addition, self-efficacy always refers to task-specific capability (Gist & Mitchell, 1992). However, self-esteem is regarded as global and domain specific (James, 1892; Orth et al., 2021) but is not task specific. Similarly, Cook and Artino (2016) also mentioned that sometimes self-efficacy is confused with self-esteem. They argued that self-efficacy is very dynamic and context specific in nature but self-esteem is not. Brockner (1988), and Gist and Mitchell (1992) emphasized that self-esteem is a global construct that captures individual's self-evaluations and not merely their confidence judgements across a wide variety of situations. Self-esteem is a broad feeling of individuals about self-worth/self-value, whereas self-efficacy is a capacity judgment (Bandura, 1997) and belief in one's ability to succeed at tasks (Tierney & Farmer, 2002) e.g., driving, studying, speaking, researching etc.; if individual believes that he has the ability to produce outcomes creatively, Tierney and Farmer (2002) named it creative self-efficacy. Innovativeness based self-esteem and creative self-

efficacy appear to be analogous constructs superficially, but in fact they are not, like self-efficacy is related to self-esteem but is not a proxy for it. Researcher theoretically differentiated between creativity and innovativeness, and self-esteem and self-efficacy. Hence, innovativeness based self- esteem could not be similar to creative self-efficacy.

Lane, Lane, and Kyprianou (2004) highlighted differences between self-efficacy and self-esteem by comparing the questions tapping both constructs. Therefore, analysing the questions tapping creative self-efficacy and innovativeness based self-esteem is a good way to understand the differences between two constructs. Tierney and Farmer (2002) measured creative self-efficacy with 3-items instrument. Item one (I have confidence in my ability to solve problems creatively) deals with individual's confidence in his ability to solve problems creatively; item two (I feel that I am good at generating novel ideas) taps the generation of novel ideas; item three (I have a knack for further developing the ideas of others) shows that people high in creative self-efficacy have an ability to develop ideas generated by other people. Similarly, Beghtto (2006) also used 3-items instrument to assess creative self-efficacy. Item one (I am good at coming up with new ideas) deals with new idea generation; item two (I have a lot of good ideas) again covers new ideas generation; item three (I have a good imagination) taps individual imaginations. Jaussi et al. (2007) tapped creative self-efficacy with 4-items instrument. Item one (In general, my creativity is an important part of my self-image) deals with self-image; item two (My creativity is important part of who I am) reflects importance of creativity for self; item three (Overall, my creativity has little to do with who I am [reverse coded]) again taps importance

of creativity for self; item four (My ability to be creative is an important reflection of who I am) deals with importance of creativity for self. It is clear that questions of three creative self-efficacy instruments are concerned with ability to generate task specific creative ideas and confidence judgements that are not inherently evaluative and have not any bearing on self-esteem. In addition, creative self-efficacy instruments do not tap individual innovativeness. In contrast, questions tapping innovativeness based self-esteem focus on self-evaluation about individual's innovativeness. For instance, item one (I am satisfied with my innovative kind of nature) considers evaluation about one's innate innovativeness; item two (I feel myself elevated when people talk about my organizational contributions) captures the feeling of worth developed on individual's unique organizational contributions; item three (I feel ultimate satisfaction when people come to know about my new ideas) deals with the satisfaction of the individual gained due to his recognition among peers; item four (I feel contented when my ideas transform into reality) taps how innovative individual feels when his innovative ideas are turned into a real innovative outcome i.e., innovation. It is also worth mentioning that people high in creative self-efficacy have a knack for further developing the ideas of others (Tierney and Farmer, 2002). However, the expert panel refined items pool for measuring innovativeness based self-esteem reasonably believed that people high in innovativeness based self-esteem feel better to generate new ideas instead of working on others' ideas. These two dimensions are mutually exclusive and highlight another important difference between creative self-efficacy and innovativeness based self-esteem self-concepts.

This theoretical and operational explanation clearly draws a line between creative self-efficacy and innovativeness based self-esteem, hence, innovativeness based self-esteem should not be confused with creative-self efficacy.

Appendix-III

Innovativeness Based Self-esteem: Scale Development

Innovativeness based self-esteem scale was developed by carefully examining the literature on personal innovativeness (e.g., Agarwal & Prasad, 1998; Leavitt & Walton, 1975, 1981; Rogers, 2003) and self-esteem (e.g., Coopersmith, 1967; Rosenberg, 1965). An expert panel comprising 43 social/management sciences experts was formed to refine domain specific items pool and to check the items for translation (face and content) validity [40 items were created initially and 30 items were approved finally]. Items were initially designed in the light of definition of innovativeness based self-esteem i.e., the extent to which individuals feel pride and worthiness in their innovative capabilities, and considering other personal innovativeness and self-esteem related literature. Following deductive scale development technique by researcher, theoretical definition of the construct was developed first which was then used as a guide to generate domain specific items (Schwab, 1980). The study followed the inductive scale construction framework to develop the scale as proposed by Hinkin, Tracey, and, Enz (1997).

According to Lin et al. (2011), the purpose of focus group research is to facilitate an organised selected group discussion, which includes representatives of various classes. While the outcomes of these discussions give insights and also provide better understandings of the subject which a simple survey items may not be able to achieve (Lin et al., 2011).

Furthermore, focus group discussions allow brainstorming that brings additional information to the current issues and stimuli for new ideas.

First, the expert validity survey has been used for this study. This research design, however, helps to gather experts to confirm their expertise in an area or field (Lin et al., 2011). Based on this design, a panel of qualified experts was formed as a focus group and the in-depth discussions to gauge more specific ideas about resources and capabilities were carried out. Thus, this group of experts provided their suggestions and views, based on their expertise and previous studies in the literature that the researcher of the present study has reviewed.

This study attempted to develop innovativeness based self-esteem scale by forming an international expert panel. To execute the process of expert panel formation and validating the scale items in professional manner, researcher hired a U.S based social networking organization which also provides consultancy services in qualitative and quantitative research paradigms. To achieve the desired objectives, the consultancy firm identified 50 social/management sciences experts. The following stages were involved in the formation of expert panel. Kickoff stage: The researcher worked with a consultancy agency to let them understand “what expertise are needed to address the development of new scale and field related specialties?” Widecast: The researcher struggled to answer the question: “Who should be considered for expert panel?” The researcher communicated with the agency to identify the individuals who are expert in areas of business management, organizational behaviour, and research methods for business. Shortlisting: The researcher guided the agency to seek answer to the question “which

individuals should be considered in greater detail to participate on expert panel?" The agency also collected additional information about the nominated individuals by searching online profiles, publications and other scholarly contribution by identified individuals. Lastly, in the Panel Selection stage, researcher and agency determined and documented that "who will serve on the panel?" The stages are shown in Figure 1.

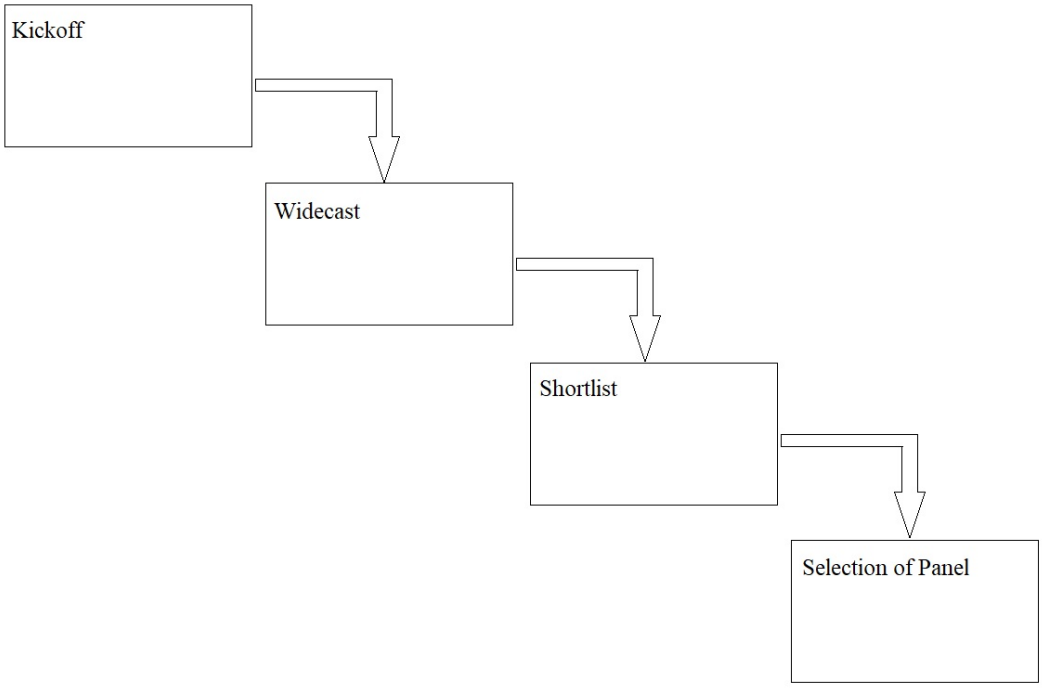

***Figure 1*. Expert Panel Stages**

The experts were contacted by following modified Dillman (2000) protocol. He suggested five steps data collection process through postal mail surveys: 1) mailing pre-notice letter, 2) initial mailing of the questionnaire, 3) thank you and reminder postcard, 4) mailing a replacement questionnaire, if necessary, and 5) final contact with non-respondents. For the present study, pre-notification was sent via an e-mail message to the Expert Panel and provided them with a brief description of the study, timeline of activities, and

request for their participation in study. Within 10 days of the pre-notice e-mail, the experts were sent a cover letter describing their supposed contribution and online questionnaire. The cover letter included important aspects like name and address, date, salutations, letter subject, significance of the new construct, survey and its usefulness, due date, confidentiality, voluntary participation, and contact information for questions.

As mentioned earlier, a total of 50 experts were contacted and requested to review the instrument for its appropriateness and relevance to the topic of personal innovativeness and self-esteem. However, only 43 individuals responded back and showed their consent to participate in the formation of scale. The individuals have significant standing in the areas of organizational behaviour, business and management, organizational psychology and neuroscience, qualitative and quantitative methods for business etc. In addition, the panel consists of 5-females and 38-males. Experts belong to Belgium, Bulgaria, Finland, India, Indonesia, Iraq, Iran, Italy, Kenya, Lithuania, Nertherlands, Nigeria, Pakistan, Poland, Qatar, Romania, Slovenia, Spain, Saudi Arabia, Taiwan, USA, and UK.

Initial questionnaire was administered to 43 panellists. After checking the accuracy of data, exploratory factor analysis (EFA) technique was applied and items were reduced to 8 (communalities after extraction ranged from 0.653 to 0.880). The second questionnaire was administered to 250 individuals working in hi-tech and R&D sectors in Pakistan. After checking data for errors and omissions, 237 responses were found right for analysis. Therefore, responses were again exploratory factor analysed and items were reduced to 3 (communalities after extraction ranged from .597 to .915, Kaiser-Meyer-Olkin

(KMO) statistic for the data was 0.70 and Bartlett's Test of Sphericity statistic was 213.25 (df = 28, p < .001). Components were retained by following the Kaiser criterion i.e., items with eigenvalues greater than one. It was observed that three items solution explained 56.44 percent of total variance. Observing the scree plot, it was found that the eigenvalue for fourth item was 0.984, which was very close to one. Hair et al. (2009) suggested that an acceptable solution must explain at least 60 percent minimum total item variance, and Hinkin and Schriesheim (1989) recommended that a reliable scale must have at least 4 items. Following these recommendations, the fourth component was included into solution (total item variance 68.74%). Scale items include “I am satisfied with my innovative kind of nature”, “I feel myself elevated when people talk about my organizational contributions”, “I feel ultimate satisfaction when people come to know about my new ideas” and “I feel contented when my ideas transform into reality”. The responses were tapped on 7-point Likert response format (1= Strongly Disagree, 7= Strongly Agree). Table 1 provides results of second exploratory factor analysis.

Table 1

Exploratory Factor Analysis Final Results

ID	Items	Communalities	Loadings
ID7	I feel better to generate new ideas instead of working on others' ideas.	.636	-
ID28	I actively combine novel and unrelated information in order to access new experiences.	.597	-
ID12	**I am satisfied with my innovative kind of nature.**	.692	.781
ID8	**I feel myself elevated when people talk about my organizational contributions.**	.788	.881
ID1	**I feel ultimate satisfaction when people come to know about my new ideas.**	.915	.948
ID15	I like to practically implement my new ideas instead of dreaming only.	.621	-
ID6	**I feel contented when my ideas transform into reality.**	.642	.791
ID13	It gives me ultimate satisfaction when I apply my new ideas mechanically.	.608	-

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Appendix-IV

Ethical Approval

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/81/2020

4 June 2020

Dr Nurliyana Binti Maludin
Department of Entrepreneurship
Faculty of Business and Finance
Universiti Tunku Abdul Rahman
Jalan Universiti, Bandar Baru Barat
31900 Kampar, Perak

Dear Dr Nurliyana,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your research project (PhD student's project) and are pleased to inform you that your application has been approved under expedited review.

The details of your research project are as follows:

Research Title	Personal Innovativeness Based based Self-esteem: Establishing Construct and Predictive Validity
Investigator(s)	Dr Nurliyana Binti Maludin Mahmood Anwar (UTAR Postgraduate Student)
Research Area	Social Sciences
Research Location	Islamic Republic of Pakistan
No of Participants	150 participants (Age: 25 - 60)
Research Costs	Self-funded
Approval Validity	4 June 2020 - 3 June 2021

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research,

(2) Confidentiality of participants' personal data must be maintained; and

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

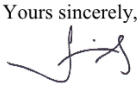
Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax**: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

Should you collect personal data of participants in your study, please have the participants sign the attached Personal Data Protection Statement for your records.

The University wishes you all the best in your research.

Thank you.

Yours sincerely,



Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Business and Finance
Director, Institute of Postgraduate Studies and Research

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
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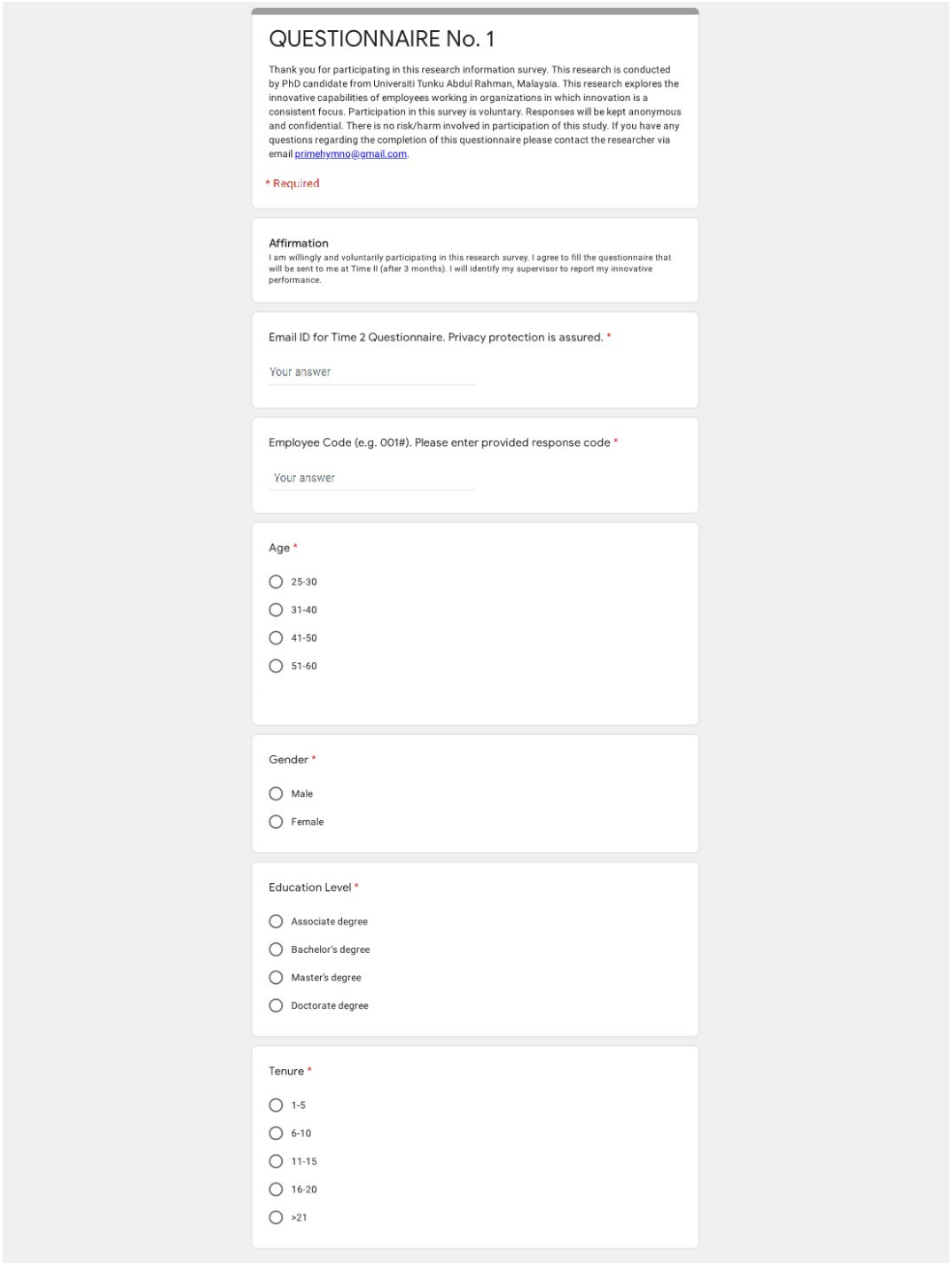
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

Appendix-V

Time 1 Questionnaire (Self-Rated)



QUESTIONNAIRE No. 1

Thank you for participating in this research information survey. This research is conducted by PhD candidate from Universiti Tunku Abdul Rahman, Malaysia. This research explores the innovative capabilities of employees working in organizations in which innovation is a consistent focus. Participation in this survey is voluntary. Responses will be kept anonymous and confidential. There is no risk/harm involved in participation of this study. If you have any questions regarding the completion of this questionnaire please contact the researcher via email primehymno@gmail.com.

* Required

Affirmation

I am willingly and voluntarily participating in this research survey. I agree to fill the questionnaire that will be sent to me at Time II (after 3 months). I will identify my supervisor to report my innovative performance.

Email ID for Time 2 Questionnaire. Privacy protection is assured. *

Your answer

Employee Code (e.g. 001#). Please enter provided response code *

Your answer

Age *

- 25-30
- 31-40
- 41-50
- 51-60

Gender *

- Male
- Female

Education Level *

- Associate degree
- Bachelor's degree
- Master's degree
- Doctorate degree

Tenure *

- 1-5
- 6-10
- 11-15
- 16-20
- >21

I count around here. (Around here means in your organization) *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am taken seriously around here. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is faith in me around here. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am trusted around here. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am helpful around here. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am a valuable part of this place. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am efficient around here. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am an important part of this place. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I make a difference around here. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am cooperative around here. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I decide on my own how to go about doing the work. *

	1	2	3	4	5	6	7	
Very Inaccurate	○	○	○	○	○	○	○	Very Accurate

The job gives me a chance to use my personal initiative or judgment in carrying out the work. *

	1	2	3	4	5	6	7	
Very Inaccurate	○	○	○	○	○	○	○	Very Accurate

The job gives me considerable opportunity for independence and freedom in how I do the work. *

	1	2	3	4	5	6	7	
Very Inaccurate	○	○	○	○	○	○	○	Very Accurate

I am interested in new ideas. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am interested in news that deals with new development in technologies or discovery. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am interested using new technologies. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

In general, I am falling behind other people in terms of accepting something new. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am willing to select to a challenging work assignment that I can learn a lot from. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I often look for opportunities to develop new skills and knowledge. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I enjoy challenging and difficult tasks at work where I'll learn new skills. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

For me, development of my ability is important enough to take risks. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I prefer to work in situations that require a high level of ability and talent.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I feel contented when my ideas transform into reality. *

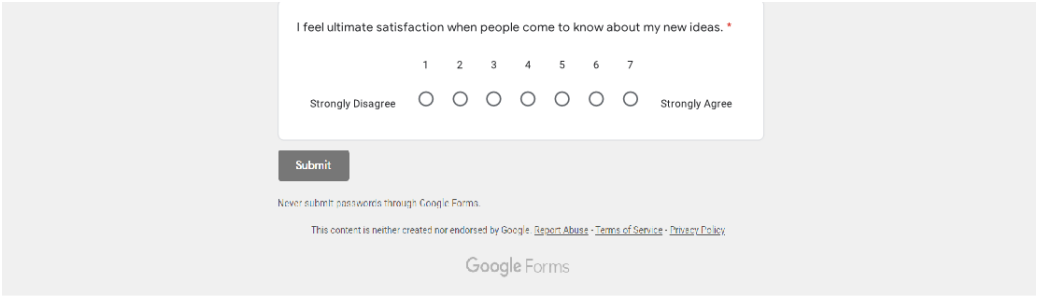
	1	2	3	4	5	6	7	
Strongly Disagree	○	○	○	○	○	○	○	Strongly Agree

I am satisfied with my innovative kind of nature. *

	1	2	3	4	5	6	7	
Strongly Disagree	○	○	○	○	○	○	○	Strongly Agree

I feel myself elevated when people talk about my organizational contributions. *

	1	2	3	4	5	6	7	
Strongly Disagree	○	○	○	○	○	○	○	Strongly Agree


I feel ultimate satisfaction when people come to know about my new ideas. *
1 2 3 4 5 6 7
Strongly Disagree
Strongly Agree
Submit
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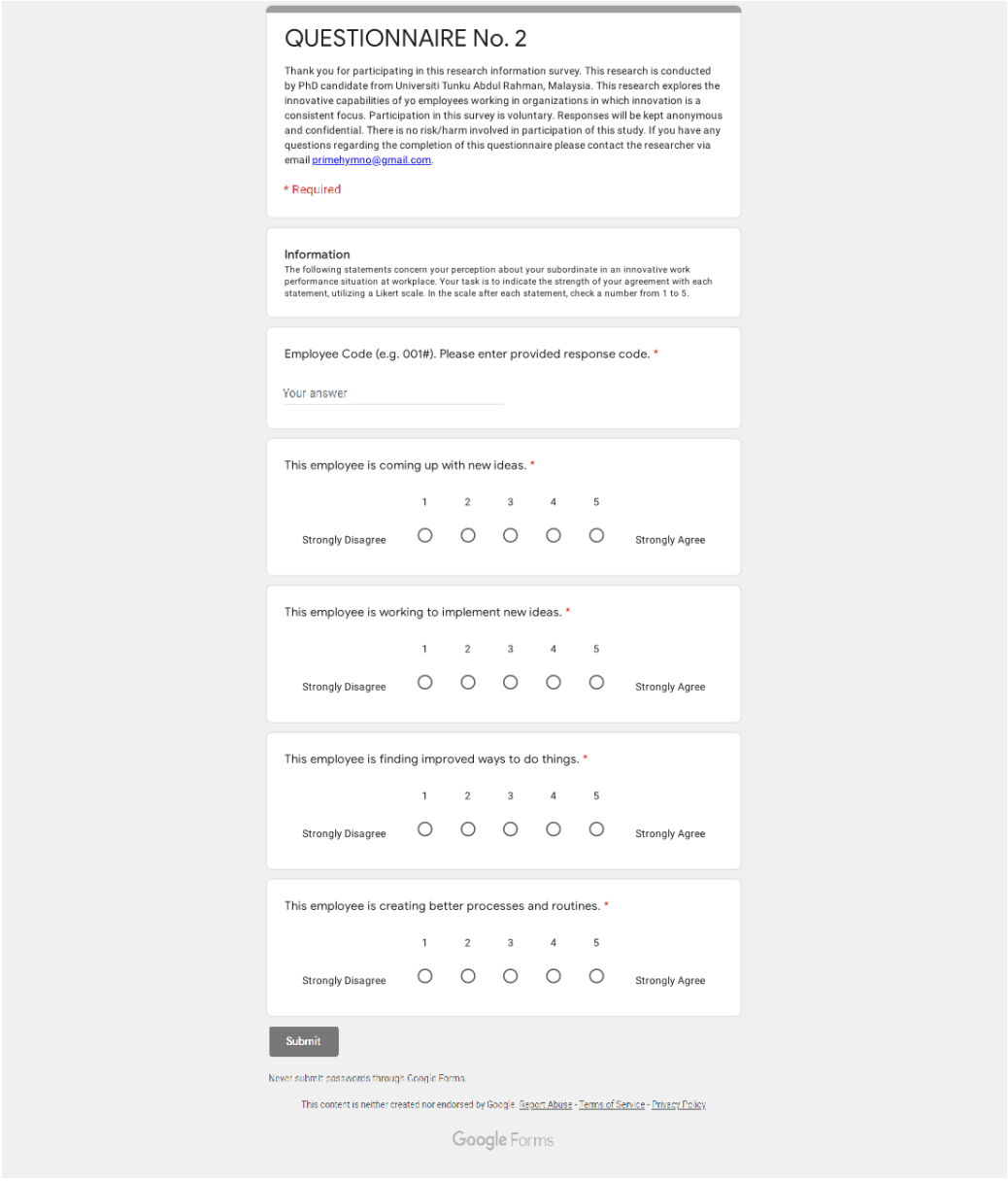
Time 1 Questionnaire (Supervisor Rated)



QUESTIONNAIRE No. 2

Thank you for participating in this research information survey. This research is conducted by PhD candidate from Universiti Tunku Abdul Rahman, Malaysia. This research explores the innovative capabilities of yo employees working in organizations in which innovation is a consistent focus. Participation in this survey is voluntary. Responses will be kept anonymous and confidential. There is no risk/harm involved in participation of this study. If you have any questions regarding the completion of this questionnaire please contact the researcher via email primehymno@gmail.com.

* Required

Information

The following statements concern your perception about your subordinate in an innovative work performance situation at workplace. Your task is to indicate the strength of your agreement with each statement, utilizing a Likert scale. In the scale after each statement, check a number from 1 to 5.

Employee Code (e.g. 001#). Please enter provided response code. *

Your answer

This employee is coming up with new ideas. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

This employee is working to implement new ideas. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

This employee is finding improved ways to do things. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

This employee is creating better processes and routines. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Submit

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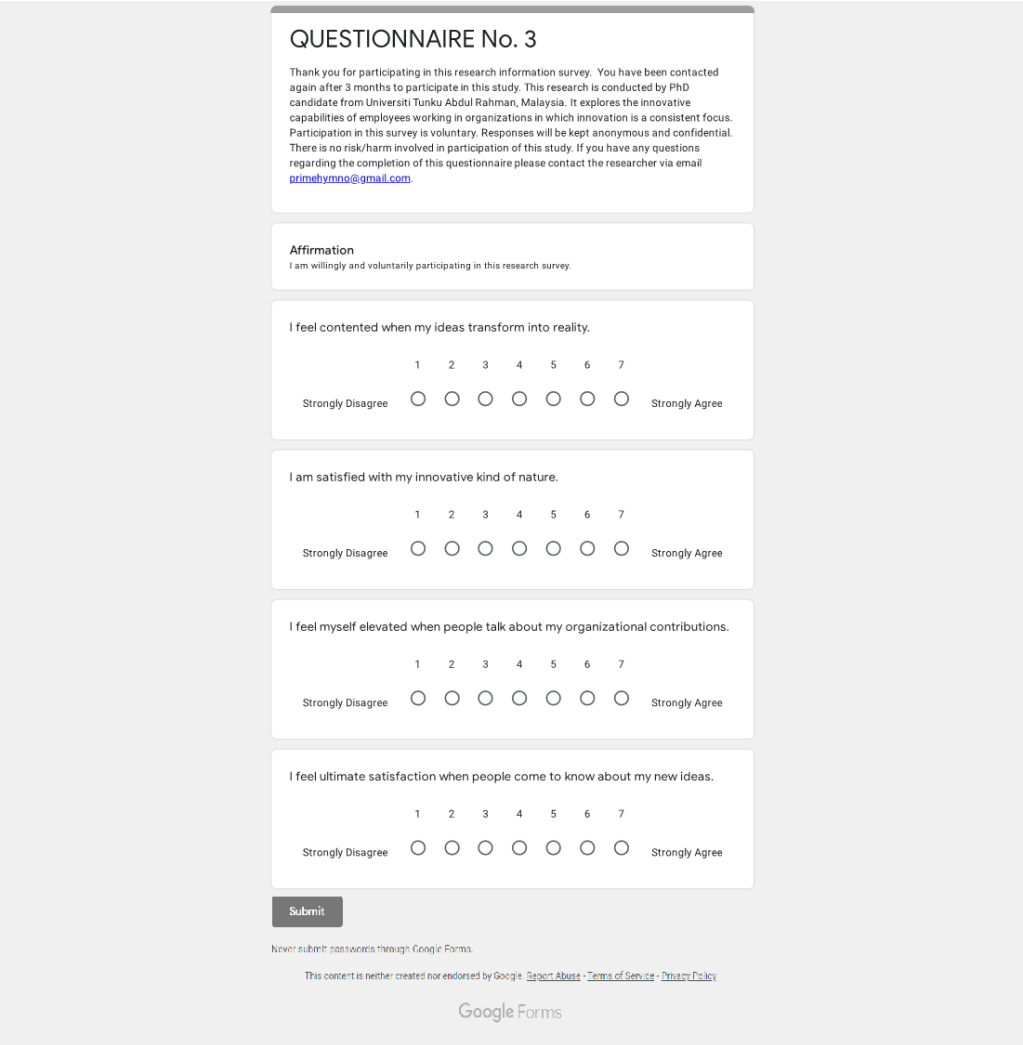
Time 2 Questionnaire (To Tap Stability)



QUESTIONNAIRE No. 3

Thank you for participating in this research information survey. You have been contacted again after 3 months to participate in this study. This research is conducted by PhD candidate from Universiti Tunku Abdul Rahman, Malaysia. It explores the innovative capabilities of employees working in organizations in which innovation is a consistent focus. Participation in this survey is voluntary. Responses will be kept anonymous and confidential. There is no risk/harm involved in participation of this study. If you have any questions regarding the completion of this questionnaire please contact the researcher via email primehymno@gmail.com.

Affirmation
I am willingly and voluntarily participating in this research survey.

I feel contented when my ideas transform into reality.

	1	2	3	4	5	6	7	
Strongly Disagree	○	○	○	○	○	○	○	Strongly Agree

I am satisfied with my innovative kind of nature.

	1	2	3	4	5	6	7	
Strongly Disagree	○	○	○	○	○	○	○	Strongly Agree

I feel myself elevated when people talk about my organizational contributions.

	1	2	3	4	5	6	7	
Strongly Disagree	○	○	○	○	○	○	○	Strongly Agree

I feel ultimate satisfaction when people come to know about my new ideas.

	1	2	3	4	5	6	7	
Strongly Disagree	○	○	○	○	○	○	○	Strongly Agree

Submit

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Regression Results

Regression

[DataSet1] C:\Users\user\Desktop\Final Thesis copy 2.sav

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Tenure, Gender, Edu, Age[b]	.	Enter
2	LGO_A, JA2_A, PI_A, OBSE_A[b]	.	Enter

a. Dependent Variable: IBSE_A

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.233[a]	.054	.022	1.35194	.054	1.668	4	116	.162
2	.622[b]	.387	.343	1.10814	.332	15.164	4	112	.000

a. Predictors: (Constant), Tenure, Gender, Edu, Age

b. Predictors: (Constant), Tenure, Gender, Edu, Age, LGO_A, JA2_A, PI_A, OBSE_A

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.196	4	3.049	1.668	.162[b]
	Residual	212.018	116	1.828		
	Total	224.214	120			
2	Regression	86.681	8	10.835	8.824	.000[c]
	Residual	137.533	112	1.228		
	Total	224.214	120			

a. Dependent Variable: IBSE_A

b. Predictors: (Constant), Tenure, Gender, Edu, Age

c. Predictors: (Constant), Tenure, Gender, Edu, Age, LGO_A, JA2_A, PI_A, OBSE_A

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.111	.576		8.874	.000
	Age	.323	.191	.251	1.697	.092
	Gender	.250	.258	.088	.970	.334
	Edu	.300	.172	.181	1.743	.084
	Tenure	.219	.137	.223	1.600	.112
2	(Constant)	2.124	1.210		1.756	.082
	Age	.300	.164	.233	1.827	.070
	Gender	.014	.217	.005	.066	.948
	Edu	.073	.153	.044	.477	.635
	Tenure	.178	.114	.181	1.567	.120
	PI_A	.351	.192	.303	3.556	.001
	OBSE_A	.390	.274	.367	2.595	.001
	LGO_A	.289	.151	.264	3.906	.000
	JA2_A	.138	.103	.116	2.074	.050

a. Dependent Variable: IBSE_A

Regression Results for Predictive Validity

Regression

[DataSet1] C:\Users\user\Desktop\Final Thesis copy 2.sav

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	OBSE_A[b]	.	Enter
2	IBSE_A[b]	.	Enter

a. Dependent Variable: IP_A

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.407[a]	.166	.159	.82778	.166	23.635	1	119	.000
2	.638[b]	.408	.392	.60383	.234	105.640	1	118	.000

a. Predictors: (Constant), OBSE_A

b. Predictors: (Constant), OBSE_A, IBSE_A

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.195	1	16.195	23.635	.000[b]
	Residual	81.541	119	.685		
	Total	97.737	120			
2	Regression	54.712	2	27.356	75.029	.000[c]
	Residual	43.024	118	.365		
	Total	97.737	120			

a. Dependent Variable: IP_A

b. Predictors: (Constant), OBSE_A

c. Predictors: (Constant), OBSE_A, IBSE_A

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.187	.708		.264	.792
	OBSE_A	.839	.173	.407	4.862	.000
2	(Constant)	.180	.518		.347	.729
	OBSE_A	.331	.135	.165	2.514	.013
	IBSE_A	.449	.043	.573	10.278	.000

a. Dependent Variable: IP_A

FACULTY OF BUSINESS AND FINANCE

UNIVERSITI TUNKU ABDUL RAHMAN

Date: 14/01/2022

SUBMISSION OF THESIS

It is hereby certified that **Mr. Mahmood Anwar** ID No: **19ABD00103** has completed this thesis entitled "PERSONAL INNOVATIVENESS BASED SELF-ESTEEM: ESTABLISHING CONSTRUCT AND PREDICTIVE VALIDITY" under the supervision of Dr. Nurliyana binti Maludin from the Department of Entrepreneurship and Supply Chain Management, Faculty of Business and Finance, and Dr. Chong Yee Lee from the Department of Marketing, Faculty of Business and Finance.

I understand that the University will upload softcopy of my thesis in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

Mahmood Anwar

Universiti Tunku Abdul Rahman			
Form Title: TURNITIN ORIGINALITY REPORT VERIFICATION FOR POSTGRADUATE PROGRAMME DISSERTATION/THESIS			
Form Number: FM-IPSR-PSU-022	Rev No.: 1	Effective Date: 06/12/2021	Page No.: 1 of 1

Name of Candidate	Mahmood Anwar
Candidate ID.	19ABD00103
Name of Main Supervisor	Nurliyana Binti Maludin
Programme	PhD Management
Title of Dissertation / Thesis	PERSONAL INNOVATIVENESS BASED SELF-ESTEEM: ESTABLISHING CONSTRUCT AND PREDICTIVE VALIDITY

The following are the required parameters of originality and limits approved by UTAR:

(i) Overall similarity index is 20% and below
(ii) Matching of individual sources listed must be less than 1% each
(iii) Matching texts in continuous block must not exceed 8 words
(iv) Parameters (i) – (ii) shall exclude quotes, bibliography and text matches which are less than 8 words

**Note: Attach a copy of the originality report with this form.*

VERIFICATION BY MAIN SUPERVISOR

Overall similarity index (%)	**10**	Supervisor's Comments (Compulsory if parameters of originality exceed the limits approved by UTAR)
Similarity by source (%):		
• Internet Sources	**8**	**The overall similarity index has met the parameter set**
• Publications	**5**	
• Student Papers	**2**	
Number of individual sources listed with more than 1% similarity	**0**	

21/06/2022

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(Signature of Main Supervisor) (Date)

VERIFICATION BY INSTITUTE OF POSTGRADUATE STUDIES AND RESEARCH (IPSR)

Parameters of originality and limits are in line with the requirements of UTAR **YES** ☑ **NO** ☐

Signature: 

Name: Nurul Akmar

Date: 20/07/2022