Empirical Research Paper

It takes more than the project manager: The importance of senior management support for successful social sector projects

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ABSTRACT

The successful completion of projects is a major challenge due to the lack of leadership competencies combined with inadequate support from senior management. In the case of the success of social sector projects, there is a research gap in the extant literature. Therefore, this study aims to investigate the moderating effect of multi-dimensional senior management support on the relationship between leadership competencies and the success of social sector projects. The study employed cross-sectional design and the stratified random sampling technique to collect survey data from 232 project managers and project directors of social sector projects in Pakistan. The findings reveal a significant impact of leadership competencies on the success of social sector projects. Furthermore, the findings demonstrate significant moderating effects of communication, power, expertise, and structural arrangements, while there is an insignificant moderating effect of providing resources on the relationship between leadership competencies and the success of social sector projects.

1. Introduction

The performance of projects in the social sector faces serious issues and challenges due to a lack of human resource capabilities, inadequate senior management support, and weak project supervision (Ahmed and Lodhi, 2021; Irfan et al., 2021). This matter requires urgent attention in the social sector through harnessing effective leadership combined with governance reforms (Asian Development Bank, 2009). The social sector refers to an economic or social activity carried out for the purpose of benefiting society (Ahmed and Lodhi, 2021), however, the slow progress in social endeavors is one of the biggest challenges for the future stability, security and economic prosperity in Pakistan (Pakistan-European Community, 2007). Indeed, while projects in the social sector are implemented for the benefit of society in order to deliver education, health and basic amenities, unfortunately, such projects have often not been given the necessary priority and especially in developing countries (Ahmed and Azmi, 2014). Furthermore, the success rate of projects implemented for the benefit of society in developing countries is comparatively poor and this has also been declining for many years (Rehman et al., 2011). However, no empirical research has yet been conducted to identify the factors involved in the success or failure of projects in the social sector and especially in developing countries such

as Pakistan, where resources are scarce and the capacity for planning and implementation of projects is limited (Sial et al., 2013; Rehman et al., 2011). Nevertheless, the low level of performance of social sector projects is often due to inadequate support from senior management as well as a lack of leadership competencies of project managers (Al-Weshah and Al-Zubi, 2012; Asian Development Bank, 2009; Sial et al., 2013; Rehman et al., 2011).

Although public sector organizations have started to look into the issues of project manager capabilities as well as inadequate support affecting the success rate of projects, this issue still needs to be fully resolved through appropriate attention by researchers and practitioners in order to ensure the successful implementation of such projects (Irfan et al., 2021). Also, social sector projects implemented under the Public Sector Development Program (PSDP) of Pakistan have suffered from delays and cost overruns due to ineffective human resources, poor planning and a lack of support from senior management (Ahmed and Lodhi, 2021). Indeed, senior management provides the vision, mission, goals and strategies for organizational development and integration of projects (Singh, 2013), which has been found to be a major critical success factor in the context of social sector projects (Shah et al., 2011). Therefore, senior management need to adopt a leading role and ensure the necessary commitment and involvement during implementation of

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social sector projects in organizations (Talib et al., 2011). However, due to limited research in the domain as well as the high failure rates of projects, debate continues on the significance of support from senior management (Ahmed et al., 2021; Anantatmula, 2010). For instance, successful social sector projects were found to be only 8%, with partially successful projects accounting for 58% and unsuccessful projects were 34% in the social sector of Pakistan (Asian Development Bank, 2005). Therefore, it can be observed that the performance of social sector projects in Pakistan is relatively low and leadership competencies need to be developed in order to ensure such projects generate the required benefits and longer-term outcomes for stakeholders and wider society in Pakistan (Ahmed and Azmi, 2014).

Leadership competencies are seen as the main predictors and causes of project manager's successful performance, which in turn has a considerable effect on project success (Moradi et al., 2020; Zhang et al., 2013). A competent project manager significantly contributes to the successful delivery of the project (Alvarenga et al., 2019). On this matter, it has been found that project managers' competencies directly account for 35–44% of project success and a lack of project managers' competencies can account for almost 60% of project failure (Moradi et al., 2020; Toney, 2001). Thus, a number of researchers have investigated this area from a range of different perspectives, including project manager's core competencies (Alvarenga et al., 2019), individual competencies (Ahmed and Anantatmula, 2017; Ahmed and Lodhi, 2021), clusters of competencies (Ahmed et al., 2020; Irfan et al., 2021), and soft or hard skills competencies (Elmezain et al., 2021; Moradi et al., 2020; Owusu-Manu et al., 2020). However, earlier studies were limited to identifying project managers' leadership competencies in different sectors or organizational context, such as construction, defense, information technology, organizational change, and social projects (Ahmed and Anantatmula, 2017; Ahmed and Lodhi, 2021; Alvarenga et al., 2019; de Rezende et al., 2021; Elmezain et al., 2021; Irfan et al., 2021; Moradi et al., 2020). Consequently, there remains a continuing need to understand the impact of multi-dimensional senior management support on the relationship between leadership competencies and the success of social sector projects, which have not been examined by earlier studies (Ahmed et al., 2020).

Despite the level of interest by researchers on the topic, the focus on leadership competencies and abilities for managing projects has led to an emerging research gap regarding the leadership competencies required in different industries and sectors (de Rezende et al., 2021). Project managers and senior management involved in social sector projects have to deliver and enhance basic facilities for society through projects and development programs (Ahmed and Azmi, 2014). Such demanding situations require highly effective leadership competencies to be deployed by project managers along with robust senior management support to ensure the successful implementation of social sector projects (Ahmed and Lodhi, 2021; Ahmed and Azmi, 2017). Although it is the case that each industry or industrial sector will provide a different context for multidisciplinary projects according to the corresponding decision-making and governance structures, nevertheless projects can be consistently delivered by project managers possessing effective leadership competencies coupled with the strong support of senior management (Urton and Murray, 2021). However, there remains a gap in the knowledge base in regard to understanding the intricate relationship between leadership competencies and project success in the presence of senior management support. Therefore, this research aims to answer the following questions: a) what is the impact of the leadership competencies of project managers on the success of social sector projects? and b) what is the moderating effect of multi-dimensional senior management support on the relationship between the leadership competencies of project managers and the success of social sector projects?

The novelty and originality of this empirical study lies on the development of a systemic and integrated model for assessing leadership competencies and senior management support to enhance the likelihood of project success. Thus, no studies in the extant literature have integrated the requisite leadership competencies of project managers with the conditions that lead to successful implementation of project management systems (da Silva et al., 2019). Furthermore, the literature reveals that there is a need to investigate the relationship between leadership competencies of project managers and project success (Alvarenga et al., 2019) with the addition of appropriate moderator variables (i.e. senior management support), to fully understand the nature of the relationship (Afzal et al., 2018). While a few studies have examined the role and impact of different leadership competencies, the focus was mainly on individual competency rather than exploring the essential leadership competencies of project managers simultaneously. Likewise, prior studies have not examined the intervening effect of multi-dimensional support provided by the senior management, especially in the context of the leadership competencies of project managers and the success of social sector projects. Therefore, the overall objective of this study is to explore the moderating effect of multi-dimensional senior management support on the relationship between leadership competencies possessed by project managers and the success of social sector projects.

The remainder of the article is organized as follows. Firstly, there is discussion of the conceptualization of leadership competencies, senior management support, project success and formulation of the research hypotheses. Secondly, the research methods covering population, sampling, and data collection procedures are explained. Thereafter, the response rate, model fit, correlation and findings of regression analyses and results of the hypotheses are presented. Finally, there is discussion of the findings, implications, conclusions, limitations and future research directions.

2. Theoretical framework and research hypotheses

Organizations are constantly trying to maximize project success and thereby minimize project failure through adopting new project management strategies and systems (Ahmed et al., 2021; Ahmed et al., 2020). Although according to Berg and Karlsen (2016), only employing dedicated project management tools is not sufficient to enhance project performance; effective leadership competencies and skills are also required to enable delivery of project outputs and long-term outcomes (Ahmed and Lodhi, 2021). It can therefore be observed that achieving project success continues to be a major concern in society and leadership competencies play an important role to maximize project success. Indeed, leadership competencies in projects can be viewed as a blend of attitude, expertise and skills that enable project activities to be conducted efficiently (Ahmed and Anantatmula, 2017). The leadership competencies possessed by project managers are considered as a catalyst to achieve project success (Podgórska and Pichlak, 2019). Furthermore, leadership competencies enable project managers to accomplish project objectives and increase the chances of project success (Yang et al., 2012).

Over the last few decades, the level of interest by both researchers and practitioners has been increasing towards the human aspects of project management, and especially the role and significance of competencies in managing projects (Zhang et al., 2020). A comprehensive understanding across the literature has been developed over the years to understand the relationship between leadership competencies and organizational success, which is based on the premise that enhanced competencies relate to superior results for project outcomes (de Rezende et al., 2021). In the context of today's societal challenges, the long-term sustainability of an organization depends on successful completion of projects; this includes both internally funded projects as well as those supported via externally funded contracts. Similar to leadership competencies, gaining the necessary backing of senior management for projects is a critical success factor (Standish Group International, 2019). Moreover, senior management facilitates through the provision of necessary resources and extends support to enable achievement of project objectives. In this regard, the current literature identifies senior

management support as one of the critical factors for project success, or failure; however, less attention has been given to explore and identify the essence of senior management support (Ahmed et al., 2021) and the resulting impact of multi-dimensional senior management support on the performance of projects in project-based organizations (Ahmed and Mohamad, 2016).

2.1. Leadership competencies

Leadership competency refers to *"the ability of an individual, a team, or an organization to mobilize and combine resources (i.e., knowledge, skills, and attitudes), in order to implement an activity in a situation"* (Loufrani-Fedida and Missonier, 2015, p.1121). Indeed, leadership competencies and skills of individuals are contemporary challenges faced by organizations (Megheirkouni and Mejheirkouni, 2020), which are also critical for the performance of project managers (Anantatmula, 2010). Although some researchers have sought to identify the challenges faced by organizations in regard to the development of leadership competencies (Megheirkouni, 2018), which are essential for the successful completion of projects that varies from project-to-project (Ahmed et al., 2020). Furthermore, Sweis et al. (2014) reported that project success often suffered from project delays which occur due to poor project supervision and incompetent leadership of the project manager. Also, the role of the project manager as a leader is critical for project success (Yang et al., 2012) and the leadership competencies of project managers significantly influence the ultimate project results (Nixon et al., 2012). In other words, project managers perform various project activities and consequently they can benefit from being equipped with multiple competencies and the underpinning skills to cope with a range of different types of situations (Galvin et al., 2014; Ika and Saint-Macary, 2012).

Although the competencies that influence the leadership performance of project managers have received little scholarly attention in the context of development and social projects (Owusu-Manu et al., 2020). Also, leadership competencies represent the anticipated reflection of project managers which are the key to the manager's successful role but frequently overlooked in practice (Zulkarnaen and Madhakomala, 2020). However, the lack of emphasis on competencies highlighted by scholars may affect the appropriate knowledge required to lead and deliver projects (Denicol et al., 2020). Indeed, leadership competencies required to manage tasks are considered important in achieving project success (Moradi et al., 2020) because the success of projects cannot usually be achieved without project managers possessing the requisite leadership competencies (Podgórska and Pichlak, 2019). In order to contribute to the success of projects according to the schedule, budget and performance specifications of the project, project managers also need to possess a variety of leadership competencies to manage teamwork and achieve the required level of performance (PMI, 2017)). Project managers should carefully plan project activities and ensure that tasks are completed on schedule and within budget (Obradovica et al., 2013), and project success is achieved through an efficient delivery of project outcomes (Sundqvist et al., 2014). As a result, project managers need to adopt appropriate leadership competencies and perform a series of actions under challenging conditions in a consistent manner (Geoghegan and Dulewicz, 2008; Müller et al., 2012). Furthermore, the competent project managers focuses efforts towards securing the required level of support from senior management (Anantatmula, 2010), and ensures the availability of resources throughout the project lifecycle (Kuen et al., 2009).

2.2. Project success

Project success refers to achieving project goals within schedule, budget, scope and quality requirements (Feger and Thomas, 2012). Although the term project success has been widely discussed in the project management literature and has received much attention from researchers, however there remains very little consensus on its definition (Alvarenga, Branco, Guedes, Soares, & e Silva, 2019). Consequently, there is a need to improve our understanding of project success, since success can be defined in many different ways and it is difficult to encompass all success factors in a single success model (Renaud and Kumral, 2020). Although the term project success is frequently cited in the *Project Management Body of Knowledge* (PMI, 2017) it is without any clear definition and instead tends to be through just mentioning success criteria and that project objectives should be defined in the project charter (Nixon et al., 2012). Further to the measurement of project success in terms of. cost, schedule, scope, and quality, there is also a need to address other performance parameters, such as customer satisfaction (Nassar and AbouRizk, 2014).

Indeed, multi-facets of project success are required to be measured and there is a need to incorporate multi-dimensional measures of project success (Galvin et al., 2014). On this matter, earlier studies on the measurement of project success advocated that the successful completion of projects based on success criteria can yield favorable stakeholder satisfaction, despite the results of traditional performance metrics that include cost, schedule and quality performance (Lumseyfai, 2020). For instance, the Millennium Dome project in London in the United Kingdom was at the time considered as a failed project in the eyes of the British public because it did not deliver the intended admiration and glamour even though the project was completed on time and within budget (Cooke-Davies, 2002). On the other hand, the Sydney Opera House in Australia took four times longer than originally planned and completed 16 times over budget, which could be viewed as a failed project from the project management perspective, but the iconic building is now seen as a fantastic success for the nation of Australia due to the attraction and admiration that it generates (Thomsett, 2002).

Over the last several years, project success has been investigated from different perspectives according to different criteria and debate is continuing on developing a uniform set of success criteria for the measurement of all types of projects (Yang et al., 2014). Besides, project success is measured in terms of performance (i.e. on schedule and within budget), functionality (i.e. scope performance and quality level), project efficiency, business success and customer satisfaction ((Lumseyfai, 2020). Also, the success of projects heavily depends on meeting the objectives of cost, time, scope, and customer satisfaction (Demirkesen and Bayhan, 2020). Due to limited research studies on multi-faceted project success, Shenhar and Dvir (2007) developed a multi-dimensional project success assessment framework based on a 4-point Likert scale, which was subsequently operationalized by Ahmed and Azmi (2017) on a 5-point Likert rating scale. This multi-dimensional project success framework is adopted for this study, which includes the following: project efficiency (i.e. cost, time and scope); impact on the team; impact on customers; business (or organization) success; and preparing for the future.

2.3. Senior management support

Senior management refers to the individuals working in positions such as Chairman, CEO, President, Executive Director and other senior staff in organizations who ensure the provision of resources for successful delivery of projects (Ahmed et al., 2021). The term senior management support implies the financial, material and human support provided to a team for successful completion of a project. The involvement or participation of senior-level management in organizational activities is referred to as senior management support (Tan and Noor, 2013). Senior management must be committed and anticipate the need for project resources required to improve efficiency (Sicotte and Delerue, 2021). Indeed, senior management with sponsors and champions provide support by ensuring project attention, funding, resources, and personnel, directing project vision and planning, and influencing organizational governance, culture, and structure (Ahmed et al., 2021; Sicotte and Delerue, 2021). Also, the provision of sufficient resources,

support for effective communication, development of structural arrangements, and the senior leadership expertise and power leads to the successful completion of a project (Ahmed and Azmi, 2017).

In projects, senior management supports in the deployment of human resources and adoption of processes for development of a product and service (Sicotte and Delerue, 2021). The role of senior management support is critical and a lack of support from senior management has been highlighted as one the major concerns in projects (Ahmed et al., 2021). Senior management believe that the concerns of organizational innovation are more critical than technological issues in determining the success of any project (Sicotte and Delerue, 2021). As a result, researchers have considered the content of senior management support, emphasizing on its multidimensionality — in terms of time, resources, expertise, power, structural adjustment, and communication (Ahmed & bin Mohamed, 2016; Boonstra, 2013a; Sicotte and Delerue, 2021). Further, senior management plays a crucial role in project planning and implementation to ensure that the project is completed successfully. Previous research has found that senior management support is critical when it comes to leadership and innovation, but it has received less attention as a moderator (Mokhber, Khairuzzaman, & Vakilbashi, 2018). In order to measure the level of senior management support, this study adapted the multi-dimensions of senior management support identified by Boonstra (2013) and operationalized by Ahmed and Mohamad (2016), which are explained in the next section on research hypotheses.

2.4. Research hypotheses and research model

Competencies have received a wide and diverse exploration in general management literature whereas the project management literature often emphasizes the debate about capability at organizational or project level, rather than individual level competencies (Davies and Brady, 2016; de Rezende et al., 2021). However, leadership competencies discussed in the project management literature are limited to examining the influence of behavioral competencies (Gruden and Stare, 2018) or identifying project manager competency weights (Hanna et al., 2018), and there remains a need to examine the overall impact of leadership competencies on projects (de Rezende et al., 2021). Indeed, Denicol et al. (2020) highlighted that a lack of emphasis on competencies may affect the appropriate knowledge and skills required for successful delivery of projects and lead to performance issues in projects. Consequently, there is a need to go beyond the concept of competency as 'personal characteristics' and competencies can be described as elements of educational, professional and personal formation of an individual to guide practices in different situations (de Rezende et al., 2021). Furthermore, competency development is an individual responsibility, which is related to a process of learning with and from others, that implies knowing how to mobilize, integrate, and transfer knowledge, skills, and resources in specific situations (de Rezende et al., 2021; Ni et al., 2018).

Competencies have been contextualized and associated with a number of areas, such as knowing how to act, integrating multiple and complex knowledge, learning to learn, optimization of resources, assuming responsibilities, engaging, having a strategic vision, as well as adding social value to the individuals and organizations (de Rezende et al., 2021; Salman et al., 2020). Furthermore, ensuring that project managers are engaged early in the project and understand each component involved in the project and how all this fits into the overall goal of the project can enhance the success of projects (Eriksson et al., 2017; Urton and Murray, 2021). Also, the project managers as leaders must be able to develop leadership competencies and know their limitations while being humble, honest, and have an ability to learn from mistakes (Bianco et al., 2021). Indeed, project managers should possess the requisite leadership competencies and skills to succeed across all essential project activities (da Silva et al., 2019; Millhollan and Kaarst-Brown, 2016). Nonetheless, project managers should be able to

establish and maintain communication, vision and strategy throughout the project by influencing, guiding, motivating, monitoring, and evaluating the performance of project team members (da Silva et al., 2019). Therefore, the following hypothesis is synthesized from the literature:

H1. There is a significant relationship between leadership competencies and project success.

According to the resource-based view theory, project-based organizations often have limited time and resources to complete projects efficiently and effectively (Ghapanchi et al., 2014). As such, senior management plays a key role to efficiently allocate resources for project activities (Ahmed and Azmi, 2017). Also, support from senior management is required to secure the availability of sufficient resources in order to achieve project success (Ahmed et al., 2021). Although the projects having sufficient senior management support will have higher chances of acquisition of the necessary organizational resources required to deliver the project (Khattak and Shah, 2020). Nevertheless, the commitment and involvement of senior management ensures the availability of requisite resources (such as human, material, technological and financial) for successful delivery of a project. In addition, senior management develop and implement project-specific strategies that are utilized in decision-making and management of resources (Yun et al., 2020). Thus senior management not only provides resources but also facilitates the process of decision-making as part of a supportive organizational culture through the necessary leadership and commitment (Kiesnere & Baumgartner, 2020). Indeed, the timely provision of resources can also improve the productivity of project staff and enhances the probability of project success (Enshassi et al., 2021). Therefore, the following hypothesis is synthesized from the literature:

H2a. Provision of resources by senior management moderates the relationship between leadership competencies and project success.

Communication is one of the most critical elements in projects, which is *"a process of sharing information with others"* (Croucher, 2015, p. 24). As such, formal and informal communication with project managers and stakeholders is one of the most significant roles of senior management (Ahmed et al., 2021). Moreover, adopting an open communication approach by senior management can lead to the sharing of innovative ideas and acceptance of new technologies by the project team (Hsu et al., 2019). According to Ahmed et al. (2021), commitment and communication from senior management are important factors of project success. Senior management demonstrates its assurance and regularly communicates with project stakeholders. This includes supporting the project, motivating the team, promoting organizational projects, determining organizational changes, exploring approaches to deliver efficiency, and collaborating with project stakeholders (Boonstra, 2013). Also, a lack of effective communication causes ambiguity with regard to perceiving relevance and importance of certain project activities. Consequently, it is important for senior management and project managers to understand how effective communication impacts the success of projects (Akunyumu et al., 2019). Therefore, the following hypothesis is synthesized from the literature:

H2b. Communication by senior management moderates the relationship between leadership competencies and project success.

Expertise refers to the knowledge of a specific domain possessed by senior management (Ahmed et al., 2021). The skills of senior management can be related to know-how of projects and implementation, knowing how organizational change and system implications affect projects as well as recognizing the power and interest of the stakeholders. The knowledge and expertise of project management ensures successful completion of project activities (Ahmed and Azmi, 2017). Therefore senior management possesses sufficient knowledge and the required expertise in project management and stakeholder management in order to properly recognize the power and interests of stakeholders involved in projects (Boonstra, 2013). Furthermore, senior management

ultimately has the responsibility to improve organizational performance and enable the supporting activities for achieving strategic objectives through implementation of projects (Singh, 2013). In organizations, the skills of senior management are considered prerequisites for successful implementation of projects (Chander et al., 2013). Indeed, a requisite level of understanding and experience of the senior management in the major areas of organizational and project management can have a significant impact on project performance (Priscilla and Siregar, 2020) while the expertise of senior management also helps to motivate the project managers (Henry et al., 2019). Therefore, the following hypothesis is synthesized from the literature:

H2c. The expertise of senior management moderates the relationship between leadership competencies and project success.

In projects, delegation of authority by senior management is critical to ensure efficient management of project activities (Ahmed and Azmi, 2017). Although the identification of a project as successful or a failure depends upon assessment and the overall satisfaction of stakeholders since each stakeholder has their own criteria to judge project success (Fincham, 2002). Indeed, senior management possessing high level of authority exercise its power to support projects (Chander et al., 2013) and mobilize the required resources to ensure completion of projects within the schedule, budget and specification requirements (Yun et al., 2020). In order to facilitate system changes and improvements, senior management extends support for efficient management of project activities, in addition to clearly defining the roles and responsibilities of project team members for successful completion of the project (Boonstra, 2013). Furthermore, senior management as the overall leadership function of the organization have a significant influence on organizational performance, which inevitably cascade down to impact the performance of programs and projects (Tanikawa and Jung, 2019). Consequently, project managers and senior management have their corresponding roles to ensure successful completion of projects through the required competencies and respective power bases (Wiewiora et al., 2020). Therefore, the following hypothesis is synthesized from the literature:

H2d. Power exhibited by senior management moderates the relationship between leadership competencies and project success.

Structural arrangements refer to implementation of suitable project structural arrangements such as ensuring appropriate processes, procedures and system adoption, to achieve the objectives of the project (Ahmed and Azmi, 2017). Indeed, senior management formulate and implement effective project strategies to be used in decision-making and management processes (Yun et al., 2020). Establishing appropriate management processes and systems is an essential function of senior management to ensure project activities are delivered efficiently and effectively (Ahmed et al., 2021). In this regard, senior management is responsible for ensuring that necessary processes, procedures and project structures are in place to facilitate achievement of project objectives as well as wider outcomes (such as institutional change and stakeholder involvement) (Boonstra, 2013). Also, senior management support through implementing periodic organizational change to facilitate the smooth conduct of management processes (Novianty, 2019), which enables potential business problem to be solved satisfactorily (Lee et al., 2018). Furthermore, senior management facilitate in developing appropriate processes of information flow to avoid misunderstanding of project information that can lead to errors in design and create problems through circulation of information among project team (Hyun et al., 2020). Therefore, the following hypothesis is synthesized from the literature:

H2e. Structural arrangements instituted by senior management moderates the relationship between leadership competencies and project success.

Based on the theory of the resource-based view of strategy and the above cited literature, this empirical study proposes a new theoretical framework (Fig. 1), which is based on senior management support serving as a moderator on the relationship between the leadership competencies possessed by project managers and the success of projects.

3. Methods

3.1. Population and sampling

A post-positivistic epistemological perspective according to a deductive approach was adopted for this quantitative study that used an explanatory and cross-sectional design. For data collection, a survey questionnaire was used as an instrument to collect data from project managers and project directors of social sector projects in Pakistan. It is noted that project directors and project managers are terms that are used interchangeably in the social sector of Pakistan. The respondents needed to be key informants for the concepts and theory being investigated (Pesämaa et al., 2021). Therefore, the project managers and project directors of social sector projects were selected as respondents since they have been meaningfully involved in the project activities being studied so as to qualify as a key informant. The population size of this study was 681 development projects from the social sector, which were funded by the Government of Pakistan under the Public Sector Development Program (PSDP). The social sector in Pakistan is further classified in three distinct sub-sectors of education, health and welfare, where projects related to these sub-sectors are executed by various Ministries and Divisions functioning under the structure of the Government of Pakistan.

For quantitative studies, the sample should consist of the key informants on the topic of the research so that accurate inferences to the population can be drawn from the study's sample (Haq et al., 2019; Pesämaa et al., 2021). In this study, the stratified random sampling technique was employed to collect data based on strata of sub-sectors of the social sector (namely education, health, and welfare); having a definite number of projects where a sample of 265 was derived from a population of 681 projects according to the sample and population criteria developed by Krejcie and Morgan (1970). Furthermore, the number of observations is critical in most instances and at least ten observations for each variable needs to be collected, which enables the researchers to generalize the research findings from the sample and meet the requirements of inferential statistical analysis (Hair et al., 2018; Pesämaa et al., 2021). This study satisfies the criteria since a number of observations for the sample size as data was collected for 20 measurement variables under three main constructs of leadership competencies (10 dimensions), project success (5 dimensions), and senior management support (5 dimensions), where 200 observations are acceptable as a sample for this study. Thus, the sample is a true representation of the target population as well as an adequate sample size for the current study, as suggested by Hair et al. (2018) and Pesämaa et al. (2021). In addition, the sample size of the study is also in alignment with earlier studies on leadership competencies and the success of projects involving
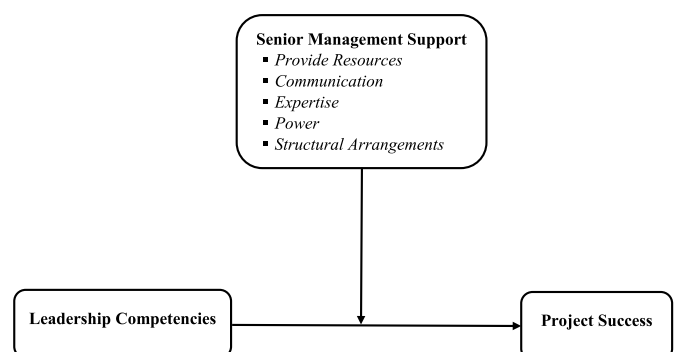

Fig. 1. Research model.

similar a number of items for the measurement of variables cited in this study, including the work of Müller et al. (2012), Yang et al. (2012), and Yang et al. (2014).

3.2. Operationalization of variables

The measurement and operationalization of variables was based on adapted instruments from earlier studies (see Table 1). The scales established more than five years old generally need to be adapted for relevant studies (Hair and Sarstedt, 2021). Accordingly, established scales were adapted and a survey questionnaire was used to collect sample data from the identified population associated with the source of information and objectives of the study (Hair et al., 2018). For this study, 42 items for measurement of leadership competencies (5-point Likert scale) were adapted from Clarke (2010), Geoghegan and Dulewicz (2008) and (PMI, 2017); 22 measurement items (5-point Likert scale) for measurement of senior management support were adapted from Ahmed and Azmi (2017); and 25 measurement items (5-point Likert scale) of project success were adapted from Shenhar and Dvir (2007) and Ahmed and Azmi bin Mohamad (2016).

3.3. Data collection methods

To identify the respondents for the collection of data, the Office of the Social Sector Projects in the Planning Commission of the Government of Pakistan was contacted and a list of project directors/project managers of social sector projects executed under Public Sector Development Programs (PSDP) was obtained. The list includes the name of project managers/project directors, addresses, phone numbers, emails, project title, project type, project size, and project funds allocation. Accordingly, the project managers/project directors were contacted for collection of data through a survey questionnaire from the social sector of Pakistan. Project managers and project directors were chosen as respondents based on earlier similar studies dealing with leadership competencies and projects (Ahmed and Lodhi, 2021; Ahmed and Anantatmula, 2017; Ahmed et al., 2021).

3.4. Survey instrument

The survey questionnaire as an instrument was used to collect data from the respondents from the social sector. In addition to demographic data, existing measurement tools were used for senior management support across the dimensions of providing resources, communication, authority, power, and structural arrangements (Ahmed & Mohamed, 2016; Ahmed et al., 2021), for project success dimensions of project efficiency, impact on customer, impact on customer, direct business success, and preparing for the future (Ahmed and Mohamad, 2016; Ahmed and Lodhi, 2021; Shenhar and Dvir, 2007), and leadership competencies were measured through adapted scales from earlier studies (Ahmed and Anantatmula, 2017; Clarke, 2010; Geoghegan and Dulewicz, 2008; PMI, 2017). A summary of measurement items used for survey instrument along with respective factor loadings is presented in Table 1.

3.4.1. Follow-up and response rate

The survey questionnaire was distributed among 265 project directors/project managers of completed projects in the social sector of Pakistan. In the first instance, 92 responses were received and the remaining respondents were reminded to participate in the survey. In the second phase, a further 73 completed questionnaires were received. After the final reminder request, 67 further completed questionnaires were obtained. Out of 265 distributed questionnaires, a total of 232 completed responses were received from participants with an overall response rate of 87.5%. After reviewing the data from responses and missing values, 218 valid responses were used for analysis by using SPSS and AMOS software. To test impact, different types of categorial data is

Table 1

Summary of survey instrument measurement items.

ID	Measurement items	Loading
Measures of Leadership Competencies		
LC1	made ahead planning to organize and manage project resources in an efficient manner	0.67
LC2	perceived project goals and objectives very clearly	0.71
LC3	regularly monitored the work of project staff to manage project outcome	0.66
LC4	used to evaluate team's work by giving sensitive and honest feedback	0.66
LC5	transformed project long-term goals into action plans	0.66
LC6	communicated the vision and instructions to the project team in an appropriate manner	0.51
LC7	engaged others through lively and enthusiastic communication to win support for the project	0.43
LC8	maintained formal communication channels during the project work	0.51
LC9	employed communication for coaching and mentoring the project team	0.79
LC10	tailored communication according to the interest and accessibility of the project team and other stakeholders	0.63
LC11	established informal communication channels with project stakeholders	0.52
LC12	autonomy provided to project team for successful completion of the project	0.46
LC13	encouraged the team to take on challenging and demanding tasks of the project	0.69
LC14	provided an environment of empowering to enhance efficiency, trust, and vision of the team	0.53
LC15	supported the team to solve problems by developing innovative ideas and proposals	0.62
LC16	encouraged the team to cope with the challenges of existing practices and policies in a broader perspective	0.64
LC17	shared knowledge and expertise with project staff	0.57
LC18	encouraged teamwork for successful accomplishment of project objectives	0.72
LC19	maintained good working relationship with others involved in the project	0.80
LC20	developed confidence and trust of the team and other stakeholders involved in the project	0.61
LC21	collaborated with others to manage project scope, roles, expectations, and task specifications	0.50
LC22	stimulated and energized the team to achieve project objectives	0.65
LC23	motivated the team to focus on short-term and long-term goals of the project	0.45
LC24	encouraged the team to pursue demanding goals in an achievable manner	0.52
LC25	inspired the team to feel pride for being associated with me and want to work together in future	0.45
LC26	explored a wide range of relationships for achieving project objectives	0.53
LC27	judged issues and implications of the project in a broader perspective	0.65
LC28	awareness of project stakeholder's needs and expectations	0.49
LC29	explored strategies for maximizing the opportunities and minimizing the threats of the project	0.53
LC30	maintained balance into the project's short-term and long-term considerations	0.58
LC31	conscious about the implications and impact of external factors on project outcome	0.72
LC32	employed critical ability to identify and probe the facts regarding project outcome	0.67
LC33	analyzed the advantages and disadvantages of the project in a critical manner	0.67
LC34	noticed the shortcomings of ideas and proposals concerning the project	0.75
LC35	made sound judgments and decisions for successful accomplishment of the project	0.49
LC36	awareness about the impact of assumptions made for the project	0.70
LC37	established sound priorities for project's futuristic work	0.50
LC38	imaginative and innovative in all aspects of project work	0.54
LC39	communicated clear vision for project's future directions to meet organizational needs	0.59
LC40	anticipated the impact of changes on project's vision due to implementation issues and business realities	0.50
LC41	awareness of own strengths and weaknesses	0.68

Table 1 (*continued*)

ID	Measurement items	Loading
LC42	often demonstrated a thirst for positive criticism	0.71
LC43	awareness about the impact of emotions on the project work environment	0.55
LC44	possessed self-belief with capability to manage own emotions	0.72
LC45	focused on a course of action for achieving project results through personal challenge or constructive criticism	0.54
LC46	performed consistently in a range of situations under pressure by adapting appropriate behaviours	0.62
LC47	balanced the needs of project situation and task with the needs and concerns of the individuals involved in the project	0.52
Measures of Senior Management Support		
MS1	provided adequate resources for successful implementation of the project	0.82
MS2	provided sufficient resources for instituting organizational change to facilitate effective system implementation	0.77
MS3	provided adequate resources to facilitate system adaptations in the organizational setting	0.75
MS4	provided adequate resources to encourage a supportive stakeholder environment for successful completion of the project	0.66
MS5	established frequent communication with project team members for successful implementation of the project	0.59
MS6	often communicated to sell the project to the rest of the organization	0.77
MS7	regularly communicated to explain the organizational implications and organizational changes related to project implementation	0.76
MS8	frequently discussed potential system changes related to the organizational effectiveness	0.66
MS9	continuously communicated to discuss implications of the project with various groups of stakeholders	0.72
MS10	possessed relevant expertise and experience in project management	0.64
MS11	often recognized the changes and implications associated with project implementation	0.69
MS12	Provided awareness of necessary system adaptations in the organization	0.74
MS13	recognized the power and interest of all stakeholders around the project	0.74
MS14	used its power to support the project and protect the project team members	0.60
MS15	used power to facilitate effective system implementation for instituting organizational change	0.58
MS16	used its power to facilitate and enforce essential system changes	0.68
MS17	used its power to determine the needs, roles, and positions of project stakeholders	0.64
MS18	exercised its authority to develop better project management capabilities in the organization	0.75
MS19	organized and enforced adequate project structures for successful implementation of the project	0.68
MS20	instituted appropriate processes, procedures and controlling mechanism for implementing organizational change in the adopting organization	0.71
MS21	established adequate structures for adaptation of system to improve organizational efficacy	0.69
MS22	adapted the organization to strengthen the stakeholder's support for successful completion of the project	0.71
Measures of Project Success		
PS1	the project was completed on time or earlier	0.81
PS2	the project was completed within or below budget	0.84
PS3	the project had only minor changes in scope	0.60
PS4	the project achieved overall expected efficiency measures	0.67
PS5	the project met predefined quality parameters	0.58
PS6	the product improved the customer's performance	0.71
PS7	the customer was satisfied with deliverables	0.76
PS8	the product met the customer's functional and technical requirements	0.79
PS9	the product improved the customer image and value	0.80
PS10	the product improved the customer loyalty and trust	0.76
PS11	the project team was highly satisfied and motivated	0.57
PS12	the team was highly loyal to the project	0.68
PS13	the project team had high morale and energy	0.77
PS14	the team felt that working on this project was fun	0.80
PS15	the team members experienced personal growth	0.69
PS16	the project was an economic business success	0.62
PS17	the project increased the organization's productivity	0.47

Table 1 (*continued*)

ID	Measurement items	Loading
PS18	the project enhanced the organization's market value	0.59
PS19	the project directly contributed to the organization's performance	0.71
PS20	the project improved the efficiency of organization	0.69
PS21	the project outcome will contribute to future projects	0.54
PS22	the project will help to create new markets	0.77
PS23	the project created new technologies for future use	0.75
PS24	the project contributed towards new business processes	0.83
PS25	the project supported in developing better managerial capabilities	0.64

required, such as gender and experience, which enable the researchers to examine potential differences for various categories of belongingness (Pesämaa et al., 2021). Therefore, demographic data was also collected for this study and the summary of demographic data is presented in Table 2.

3.5. Reliability and validity

According to (Streiner, 2003, p.217), the central point of the classical test theory is the degree of internal consistency of the measurement scale. Therefore, the value of 0.70 Cronbach's alpha (α) is considered suitable and above than 0.8 is considered meritorious indicating higher degree of internal uniformity (Carmines and Zeller, 1979; Litwin, 1995; Nunnally, 1978). The Cronbach's alpha value was determined as follows: leadership competencies ($\alpha = 0.97$), senior management support ($\alpha = 0.96$), and project success ($\alpha = 0.93$); all values were above 0.90, which is considered 'excellent' (George and Mallery, 2003). Validity was checked to ensure the accuracy of the instrument (Mirabella, 2008). Following the Hair et al. (2018) guidelines, all 47 items of leadership competencies were retained for running factor analysis (see Table 1). Exploratory Factor Analysis (EFA) by using Principal Component Analysis (PCA) identified that items of leadership competencies explained total variance of 64.14%. The KMO test revealed a value of 0.936 for leadership competencies that is well above the cut-off value of 0.60 and the Bartlett's test yielded a significant result [$\chi 2$ (1081, n = 218) = 6904.529, p < 0.001] (Tabachnick and Fidell, 2007). KMO (0.956) and Bartlett's test of Sphericity (3933.331, df = 231) suggested the

Table 2
Summary of demographic data.

Demographic	Characteristics	N	Demographic	Characteristics	N
Gender			**Experience**		
	Male	165		<3 Years	37
	Female	53		3–5 Years	40
Age				5–10 Years	67
	25–30 years	86		10–15 Years	38
	36–40 years	27		>15 Years	36
	46–50 years	24	**Project Cost**		
	51–55 years	18		Small (≤60 M)	101
	>60 years	18		Medium (>60M & ≤100M)	83
Education				Large (>1000 M)	34
	PhD	36	**Team Size**		
	MS/MPhil	61		Small (≤15)	79
	Master	75		Medium (>15&≤40)	64
	Bachelor	46		Large (>40)	21
Sub Sectors			**Project Duration**		
	Education	96		≤ 1 year	52
	Health	71		≤ 3 year	54
	Welfare	51		≤ 5 year	61
				≤ 7 year	22
				>7 year	29

significance (p = 0.000) of the senior management support. Similarly, significant results of Bartlett's test [χ2 (300, n = 218) = 3099.886, p < 0.001] with KMO value of 0.901 were received for project success factors, which were above the 0.60 cut off-value (Tabachnick and Fidell, 2007).

3.6. Model fit

Path diagrams were constructed for measurement of leadership competencies of project managers, senior management support and project success through loading of all latent variables on one-factor model. The factor loadings of all items to measure the model fit were well above 0.50 cut-off value as recommended by Hair et al. (2018). The model of project manager's leadership competencies provided a reasonable-to-mediocre fit to the data, with fit indices CMIN/DF = 1.84 (p < 0.001), RMSEA = 0.069, RMR = 0.030, CFI = 0.96, TLI = 0.95, and PCLOSE = 0.000 (p > 0.000). The value of PLCOSE is insignificant, but the value of CMIN/DF is significant. Therefore, all other fit indices suggested the validity of the model with good model fit statistics for measurement of project manager's leadership competencies. The senior management support model gave an acceptable-to-mediocre fit with indices CMIN/DF = 1.90 (p < 0.001), RMSEA = 0.064, RMR = 0.039, CFI = 0.96, TLI = 0.95, and PCLOSE = 0.011 (p > 0.000). The findings of fit indices with significant values suggest that the model is statistically good fitness model for measurement of senior management support. Project success model provided an acceptable-to-mediocre fit with fit indices CMIN/DF = 1.83 (p < 0.001), RMSEA = 0.062, RMR = 0.038, CFI = 0.94, TLI = 0.93, and PCLOSE = 0.035 (p > 0.000). The findings suggest that the model has statistically significant good fit data model for measurement of project success.

Similarly, path diagram for measurement of overall model fit by loading all latent variables on two factor model was constructed. The result reveals that the value of the relative chi-square (χ2) index (CMIN/DF) for the overall measurement model is 1.6992 (p=<0.001), which is significant and within the threshold. The Chi-square index (CMIN/DF) value suggests a good fit for the estimated model. The GFI value for the overall measurement model is 0.89, which is very close to 0.90, which indicates the model has good fit. The RMSEA value of the overall measurement model is 0.056, which is within the range of 0.05–0.08, and PCLOSE associated with RMSEA is 0.18 (>0.05), shows that the model has good fit with excellent fit indices. For an overall measurement model, the SRMR value is 0.030, well below the threshold value (<0.090) and indicates that the model has a good fit. The fitness of data was measured on the one-factor as well as two-factor model to avoid the issue of endogeneity. Moreover, the explanation on findings have been discussed in the next sections and follow the guidelines of endogeneity described by Pesämaa et al. (2021).

4. Findings

The process of regression diagnostic was adopted to check three distinct stages of formulating the model, fitting a model to data, and checking the model. The normal distribution curve with a histogram of residuals was compared to check the normality, which demonstrated

normal distribution line without violation of any assumption (Hair et al., 2018). Kolmogorove-Smirnove (K–S) and Shapiro-Wilk tests were used to test the normality of sample data where the value of significance should be > 0.05 (or at least p > 0.01) and no significant normality deviation was found through Kolmogorove-Smirnove and Shapiro-Wilk tests. The summary of correlation coefficient (r) is given in Table 3.

Project manager's leadership competencies explained significant variance of 18.20% in project success (ΔF = 40.343, p < 0.001). The standardized Beta value of leadership competencies was positive and highly significant (β = 0.392, p < 0.001). The results indicate leadership competencies have significant influence on project success (see Table 4). The results show that projects are seen to be more successfully completed when project managers undertake the following: efficiently manage project resources, employ effective communication, encourage teamwork, apply critical and analytical approaches, provide vision and imagination, establish environment of empowering, encourage constructive criticism, provide honest feedback, consistency in tasks, provide mentoring and coaching of team members, ensure continuous monitoring of project activities, and focus on the needs of the team and meeting the expectations of the stakeholders. Thus, hypothesis 1 is supported.

Project manager's leadership competencies (LC) explained 16.40% of the variance in project success for all dimensions of senior management support (Model 1). As evident from Table 5, the provision of resources (POR) explained 23.30% variance in project success, with a significant value of ΔF = 21.482, (p < 0.001). Finally, the interaction term of project manager's leadership competencies and the provision of resources explained 24.20% variance in project success, with an insignificant value of ΔF = 3.641 (p > 0.05). Standardized Beta values of project manager's leadership competencies were found positive and highly significant in Model 1 (β = 0.405, p < 0.001) and Model 2 (β = 0.309, p < 0.001), and significantly positive in Model 3 (β = 0.644, p < 0.005). Standardized Beta values of providing resources were found positive and highly significant in Model 2 (β = 0.292, p < 0.001) and moderately significant in Model 3 (β = 0.929, p < 0.01). However,

Table 4
Summary of results for impact of leadership competencies on project success.

Hypothesis	Variables	Project Success			
		Model 1		Model 2	
		β	t	β	t
H$_1$	Leadership Competencies			0.392****	6.352
	R^2	0.037		0.189	
	Adjusted R^2	0.033		0.182	
	ΔR^2	–		0.152	
	F	8.357***		25.111****	
	ΔF	8.357***		40.343****	

*p < 0.05.
**p < 0.01.
***p < 0.005.
****p < 0.001.

Table 3
Summary of correlation analysis.

Sr	Variable	Mean	SD	1	2	3	4	5	6	7
1	Leadership Competencies	3.90	0.58	1						
2	Provide Resource	3.60	0.88	0.33**	1	.				
3	Communication	3.39	0.86	0.32**	0.66**	1				
4	Expertise	3.48	0.90	0.44**	0.71**	0.67**	1			
5	Power	3.52	0.85	0.31**	0.74**	0.73**	0.79**	1		
6	Structural Arrangements	3.46	0.93	0.40**	0.71**	0.73**	0.77**	0.83**	1	
7	Project Success	3.46	0.51	0.40**	0.39**	0.33**	0.40**	0.35**	0.41**	1

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

Table 5

Summary of result for moderating effect of multi-dimensional senior management support.

Variable (s)	Project Success									
	H$_{2a}$		H$_{2b}$		H$_{2c}$		H$_{2d}$		H$_{2e}$	
	LC x POR		LC x COM		LC x EXP		LC x PWR		LC x STA	
	β	t	β	t	β	t	β	t	β	t
Step 1: Independent										
Model 1	0.405****	6.513	0.405****	6.513	0.405****	6.513	0.405****	6.513	0.405****	6.513
Model 2	0.309****	4.918	0.334****	5.217	0.284****	4.250	0.327****	5.158	0.288****	4.433
Model 3	0.644***	3.461	0.259****	3.772	0.196**	2.708	0.260****	3.749	0.193**	2.671
Step II – Moderator										
Model 2	0.292****	4.635	0.224***	3.499	0.275****	4.112	0.249****	3.926	0.292****	4.488
Model 3	0.929**	4.635	0.257****	4.008	0.289****	4.387	0.281****	4.367	0.329****	5.030
Step III: Interaction										
Model 3	−0.819	−1.908	−0.181**	−2.780	−0.188**	−2.862	−0.152*	−2.311	−0.186**	−2.804
Value of R^2:										
Model 1	0.164		0.164		0.164		0.164		0.164	
Model 2	0.240		0.209		0.225		0.220		0.236	
Model 3	0.253		0.237		0.254		0.239		0.263	
Value of Adjusted R^2:										
Model 1	0.160		0.160		0.160		0.160		0.160	
Model 2	0.233		0.202		0.218		0.213		0.229	
Model 3	0.242		0.226		0.243		0.228		0.252	
Value of ΔR^2:										
Model 1	0.164		0.164		0.164		0.164		0.164	
Model 2	0.076		0.045		0.061		0.056		0.072	
Model 3	0.013		0.028		0.029		0.019		0.027	
Value of F:										
Model 1	42.423****		42.423****		42.423****		42.423****		42.423****	
Model 2	33.964****		28.435****		31.226****		30.334****		33.162****	
Model 3	24.134****		22.126****		24.244****		22.412****		25.434****	
Value of ΔF:										
Model 1	42.423****		42.423****		42.423****		42.423****		42.423****	
Model 2	21.482****		12.240***		16.905****		15.414****		20.142****	
Model 3	3.641		7.727**		8.191***		5.342*		7.860**	

*p < 0.05, **p < 0.01, ***p < 0.005, ****p < 0.001.

LC = Leadership Competencies; POR= Provision of Resources; COM= Communication; EXP = Expertise; PWR= Power; STA= Structural Arrangements.

standardized Beta values of the interaction term (project manager's leadership competencies x providing resources) were found insignificant in Model 3 (β = −0.819, p > 0.05). The results from Table 5 identify that there is a continuous improvement and significant value of R^2 in Model 1 (R^2 = 0.164) and Model 2 (R^2 = 0.240), but insignificant in Model 3 (R^2 = 0.253, P > 0.05), which indicates that providing resources is an insignificant moderator. Hierarchal regression analysis shows that providing resources insignificantly and negatively moderates the relationship between project manager's leadership and project success. The standardized Beta value of the interaction term (LC x POR) is negative as well as insignificant (β = −0.819, p > 0.05), therefore, H$_{2a}$ is not supported.

Communication explained 20.20% of the variance in project success, with a significant value of ΔF = 12.240 (p < 0.005). Finally, the interaction term of project manager's leadership competencies (LC) and communication (COM) explained additional 27.10% of the variance in project success, with a significant value of ΔF = 7.727 (p < 0.05). Standardized Beta values of project manager's leadership competencies were found positively significant in Model 1 (β = 0.405, p < 0.001), Model 2 (β = 0.334, p < 0.001), and Model 3 (β = 0.259, p < 0.001). Standardized Beta values of communication were found positively significant in Model 2 (β = 0.224, p < 0.005) and Model 3 (β = 0.257, p < 0.005). Standardized Beta values of the interaction term (project manager's leadership competencies x communication) was found significant in Model 3 (β = −0.181, p < 0.01). The results from Table 5 show that there is a continuous and significant improvement in value of R^2 in Model 1 (R^2 = 0.164), Model 2 (R^2 = 0.209) and Model 3 (R^2 = 0.237), which validates communication as a moderator. The result of the hierarchal regression analysis shows that communication significantly moderates the relationship between project manager's leadership and project success. The standardized Beta value of the interaction term (LC

x COM) is negative (β = −0.181) with significance level (p < 0.01). Thus, H$_{2b}$ is supported.

As evident from Table 5, expertise explained 21.8% of the variance in project success, with a highly significant value of ΔF = 16.905 (p < 0.001). Finally, the interaction term of project manager's leadership competencies (LC) and expertise (EXP) explained 24.3% of the variance in project success, with a highly significant value of ΔF = 8.191 (p < 0.005). Standardized Beta values of project manager's leadership competencies were found highly positive significant in Model 1 (β = 0.405, p < 0.001) and Model 2 (β = 0.284, p < 0.001), and moderately positive significant in Model 3 (β = 0.196, p < 0.01). Standardized Beta values of expertise were found highly positive significant in Model 2 (β = 0.275, p < 0.001) and Model 3 (β = 0.289, p < 0.001). Standardized Beta values of the interaction term (project manger's leadership competencies x expertise) was found significant in Model 3 (β = −0.188, p < 0.01). Table 5 shows that there is a continuous and significant increment in the value of R^2 in Model 1 (R^2 = 0.164), Model 2 (R^2 = 0.225), and Model 3 (R^2 = 0.254), which validates expertise as a moderator. The result of hierarchical regression analysis shows that expertise significantly moderates the relationship between project manager's leadership and project success. The standardized Beta value of the interaction term (LC x EXP) is negative (β = −0.188) with significance level (p < 0.01). Therefore, H$_{2c}$ is supported.

The power of the senior management explained 21.3% of the variance in project success, with a highly significant value of ΔF = 15.414 (p < 0.001). Finally, the interaction term of project manger's leadership competencies (LC) and power (PWR) explained additional 22.8% variance in project success, with a highly significant value of ΔF = 5.342 (p < 0.05). Standardized Beta values of project manger's leadership competencies were found highly positive significant in Model 1 (β = 0.405, p < 0.001), Model 2 (β = 0.327, p < 0.001), and Model 3 (β = 0.260, p <

0.001). Standardized Beta values of power were found highly positive significant in Model 2 ($\beta = 0.249$, $p < 0.001$) and Model 3 ($\beta = 0.281$, $p < 0.001$). Standardized Beta values of the interaction term (project manager's leadership competencies x power) was found significant in Model 3 ($\beta = -0.152$, $p < 0.05$). The results from Table 5 show that there is a continuous and significant improvement in value of R^2 in Model 1 ($R^2 = 0.164$), Model 2 ($R^2 = 0.220$), and Model 3 ($R^2 = 0.239$), which validates the power of senior management as a moderator. The result of multiple hierarchal regression analysis shows that power has a significant moderating effect on the relationship between project manager's leadership competencies and project success. The standardized Beta value of the interaction term (LC x PWR) is negative ($\beta = -0.152$) with significance level ($p < 0.05$). Therefore, H_{2d} is supported.

Table 5 shows that structural arrangements explained 22.9% of the variance in project success, with a highly significant value of $\Delta F = 20.142$ ($p < 0.001$). Finally, the interaction term of project manager's leadership competencies (LC) and structural arrangements (STA) explained additional 25.2% of the variance in project success, with a highly significant value of $\Delta F = 7.860$ ($p < 0.01$). Standardized Beta values of project manager's leadership competencies were found highly positive significant in Model 1 ($\beta = 0.405$, $p < 0.001$) and Model 2 ($\beta = 0.288$, $p < 0.001$), and moderately positive significant in Model 3 ($\beta = 0.193$, $p < 0.05$). Standardized Beta values of structural arrangements were found highly positive significant in Model 2 ($\beta = 0.292$, $p < 0.001$) and Model 3 ($\beta = 0.329$, $p < 0.001$). Standardized Beta values of the interaction term (project manager's leadership competencies x structural arrangements) was found significant in Model 3 ($\beta = -0.186$, $p < 0.005$). According to the results in Table 5, there is a continuous and significant increase in the value of R^2 in Model 1 ($R^2 = 0.164$), Model 2 ($R^2 = 0.236$), and Model 3 ($R^2 = 0.263$), that validate structural arrangements as a moderator. Hierarchal regression analysis shows that structural arrangements as a moderator have significant influence on the relationship between project manager's leadership competencies and project success. The standardized Beta value of the interaction term (LC x STA) is negative ($\beta = -0.186$) with significance ($p < 0.01$). Thus, H_{2e} is supported.

5. Discussion

The findings of this study are in relation to the social sector of Pakistan, which identifies that a special emphasis on the project manager's leadership competencies associated with knowledge and skills is required for successful completion of projects. This is due to the importance and nature of change required in society through implementation of social sector projects. Indeed, these findings are in alignment with the study by Al Kazaz, Shibani, and Research (2016), which also emphasized leadership competencies of project managers and the impact on the performance of projects. Project managers are required to coordinate and motivate various stakeholders to successfully deliver a project and this process can be further improved through the effective development of leadership skills for different cultures and environments (Heslin and Keating, 2017; Owusu-Manu et al., 2020). The findings of the study show that there is a significant influence of project manager's leadership competencies on project success ($F = 42.423$, $p < 0.001$). Furthermore, effective leadership is essential for providing viable solutions to mitigate the problem of inexperience in developing countries (Ofori and Toor, 2012; Owusu-Manu et al., 2020).

In the case of adding the interaction term of project manager's leadership and each dimension of senior management support, the results of regression analysis show significant moderating effects on the relationship between project manager's leadership competencies and project success. The coefficient of regression (β_1) associated with project manager's leadership competencies has a significant value greater than zero (i.e. $\beta_1 = 0.405$, $p < 0.001$), the coefficients of the regression (β_2) associated with the dimensions of senior management support have significant value greater than zero ($p < 0.001$), and the coefficients of

the regression (β_3) associated with interaction terms have significant value less than zero ($p < 0.01$). Hence, the findings support the research hypotheses 2(a-e). The signs of beta coefficients (β_s) of predictors were analyzed to determine the type of the moderating effect on the relationship based on criteria of de Vries (1997). The dimensions of senior management support were found as substitute moderators based on the results of hierarchical regression analysis. Thus, demand for leadership competencies and support from senior management in the success of social sector projects should continue to grow unabated because these are important contributors towards project success in various cultures and situations (Ahmed et al., 2021; Owusu-Manu et al., 2020).

The relationship between project manager's leadership competencies and project success has been found to be moderated by senior management support ($\beta = -0.226$, $F = 22.717$, $p < 0.001$). In prior studies, Al Kazaz et al. (2016) revealed that leadership capabilities are a major factor that differentiates between effective leaders and managers. This positive association impacts the overall performance and success of projects. The significance of interaction terms' beta coefficient value highlights the impact of project manager's leadership competencies on project success, which depends on multi-dimensional support from senior management. Project managers need effective leadership skills to manage changes that occur during implementation of projects due to different cultures (Bejestani, 2011; Owusu-Manu et al., 2020) and must be able to grasp support from senior management in order to augment project performance in different environments and enhance likelihood of project success (Ahmed et al., 2021).

In light of the theoretical assertions of earlier studies, it has been identified that multi-dimensional senior management support affects the success of social sector projects in Pakistan due to various situations and differences (Boonstra, 2013; Lechler and Cohen, 2009; Too and Weaver, 2013; Unger et al., 2012; Young and Poon, 2013). However, a number of research studies have shown contrary results for senior management support in different cultural and environmental settings (Jonas, 2010), highlighting the positive impact of senior management support on project success (Young and Dulewicz, 2008) as well the negative influence of senior management support on project success (Bonner et al., 2002; Kessler, 2000). This study analyses the moderating effect of multi-dimensional senior management support on the predictor-criterion relationship through hierarchical regression analysis. The dimensions of senior management support as moderator (except for the provision of resources) show statistical significance in total variance for project success from values of Adjusted R^2 as well as a significant predictor of project success through the values of beta coefficients and significance level.

The findings from the study herein suggest that in the case of lower-level project manager's leadership competencies, project success can be accomplished if the level of support from senior management increases. Additionally, projects can be more successful in different circumstances and cultures when a high level of support from senior management is available to project managers having a moderate level of leadership competencies. Moreover, effective project managers and senior management help in the delivery of projects through providing viable solutions to mitigate the problem experienced across the sectors in developing countries (Ofori and Toor, 2012; Owusu-Manu et al., 2020). Based on the recommendations of Sharma et al. (1981), the dimensions of senior management support appear as quasi-moderators due to significant influence on project success. Following the guidelines of Howell et al. (1986), the dimensions of senior management support found as substitute moderators based on the results of hierarchical regression analysis, thereby indicating the significant moderating effects on the relationship between project manager's leadership competencies and project success (except for provision of resources). Following the work of de Vries (1997), multi-dimensional senior management support can be categorized as a neutralizer based on the negative moderating impact of each dimension, which is indicative of a weaker predictor-criterion relationship.

Based on the findings of this study, multi-dimensional senior management support can also be considered as a quasi-moderator on the relationship between leadership competencies and project success in light of the guidelines of Mat et al. (2012). Furthermore, the study operationalized multi-dimensional senior management support as a moderator following the guidelines of Müller et al. (2012). The occurrence of a significant interaction identifies both with or without a main effect of the moderator as a possible enhancer or neutralizer, which influence the predictor-criterion relationship but it does not influence the criterion itself (Howell et al., 1986). However, the dimensions of senior management support as neutralizer does not influence project success in the absence of project manager's leadership competencies. In addition, multi-dimensional senior management support acts as substitute variable since it augments the relationship between project manager's leadership competencies and project success.

5.1. Implications for research, practice and society

This study presents a holistic view of leadership competencies and multi-dimensional senior management support in the context of social sector projects from Pakistan. The research implications of this study are threefold. Firstly, the study significantly contributes to the body of knowledge on project management through examining the relationship between leadership competencies and project success in the presence of senior management support as a moderating factor. This is an important implication in regard to the governance of projects and how the ultimate performance of the project management process not only rests on the contributions of project managers but is also intimately connected to the direct or indirect support provided from senior management. This contribution is the context of social sector projects also addresses the research gaps of earlier studies (Afzal et al., 2018; Alvarenga et al., 2019; de Rezende et al., 2021; da Silva et al., 2019). The findings of the study deduce that diverse leadership competencies and various types of support are required to successfully deliver social sector projects since each project is always unique. Moreover, project managers must be engaged during the planning of social sector projects instead of involving them only in the execution stage of projects in the public sector. The timely involvement of project managers and effective utilization of leadership competencies can directly contribute to improving project and organizational performance in different environments (Denicol et al., 2020). The results of the study are important for researchers and the project management community interested in investigating different perspectives of competencies in projects since leadership competencies of project managers coupled with the support from senior management are more effective when present concurrently; especially during the planning and execution of projects.

Secondly, practitioners should develop effective leadership competencies to improve the rate of project success rather than just relying on the support from senior management. This is because both competencies and support are required in social sector projects, although neither leadership competencies of project managers alone nor only the support of senior management can guarantee the successful completion of projects. This finding is consistent with a contingency view of management – essentially the project management system and organizational structures should be tuned according to the circumstances of the project, i.e. the size and complexity of the project. Furthermore, this helps organizations to have an improved understanding of the resourcing of projects and the allocation of project managers across a portfolio or program of projects. Moreover, public sector projects are often initiated on the instructions of the government, where project managers have negligible participation at the time of conceptualization of such projects, which is not unlike the insignificant involvement of senior management on project closing. Nevertheless, the project owners and senior management should ensure that project managers have the required level of competencies as this may impact on the allocation of projects to project managers (Patanakul, 2011). Focusing on development of optimal

leadership competencies for the right people at the right time can help to improve performance of social sector projects. Indeed, senior management can utilize their expertise and authority for enhancing project managers' leadership competencies required for monitoring and controlling the activities of social sector projects. Furthermore, senior management can support project activities to further maximize the prospects of project success in different cultures and project-based organizations by developing appropriate structural mechanisms for the provision of resources, establishing communication channels, developing expertise, and procedures for delegation of power to project managers.

Thirdly, the implications of this study are not only relevant for researchers and practitioners (i.e. project managers, senior management and policy makers), but also for wider society. The social sector projects that are funded by respective governments or agencies are implemented for the benefit and welfare of the overall society. Based on the research findings, small and medium size projects can be successfully managed by project managers in the social sector if reasonable support is available from senior management. However, leadership competencies displayed by project managers and support provided by the senior management would be required simultaneously to successfully deliver large and complex social sector projects. Thus, organizations from the social sector can develop internal policies to ensure that requisite resources are provided by senior management in a timely fashion – this approach can therefore be integrated into organizational strategy development and the annual planning cycle for resource allocations. In addition, senior management must integrate structural mechanisms during project initiation and planning by incorporating innovative ideas in order to safeguard future contributions of projects for the benefit of wider society. Moreover, the leadership competencies of project managers need to be assessed at the time of assigning social projects to them, in addition to identification of their competencies and skills required to execute the projects in the social sector. Besides, improving the performance of social sector projects, researchers and practitioners can also gain an improved understanding of leadership competencies and the various types of support needed to manage projects across other sectors in different organizational cultures through adopting the comprehensive and integrated model presented in the current study.

6. Conclusions

Despite the general agreement on the importance of leadership competencies and senior management support a comprehensive view to date been lacking in the project management literature. Many researchers have investigated the relationship between leadership competencies and project success in the presence of various different variables, while senior management support has often been treated as a single dimensional construct. This study adds an empirical contribution to the literature by developing a comprehensive framework of leadership competencies and project success in the presence of senior management support as a multi-dimensional construct. There are also clear practitioner and societal implications of the study in regard to enhancing the understanding of the governance and resourcing requirements for social sector projects and the corresponding implementation of project management systems and processes to ensure effective project delivery.

This research study identifies a significant and positive impact of leadership competencies and multi-dimensional senior management support on the success of social sector projects in Pakistan. Based on the direct effect values (β), the influence of senior management support was found to be stronger than leadership competencies on the success of social sector projects. The findings articulate that an increase in the level of leadership competencies can improve the performance of project managers to enhance the likelihood of project success in different cultures and environments. Indeed, project managers possessing a low level of leadership competencies can manage small social projects but may require various types of support from senior management when dealing

with complex or large projects according to the nature of the projects. Furthermore, the presence of senior management support as a moderator was found to lower the significance of the relationship between leadership competencies and project success. In other words, the findings identify that multi-dimensional senior management support is a moderator variable as the values of R^2 continuously improved, which can be used as an antecedent, intervening, predictor, or suppressor variable. Thus, multi-dimensional senior management support can appear as a significant moderator (Dawson, 2014), quasi moderator (Sharma et al., 1981), and substitute moderator (de Vries, 1997; Howell et al., 1986) in different project environments and organizational cultures.

6.1. Limitations and future research directions

This study has a few limitations. Firstly, the study was limited to examining the moderating effect of multi-dimensional senior management support in the social sector. As the projects are executed in different cultures and situations, therefore, it is recommended that future research should consider senior management support as a potential mediator and moderator with different clusters and priorities of leadership competencies along with various cultural and environmental constructs in different societies, project environments, and various industries and sectors. Secondly, self-reported survey data was collected only for the construct of leadership competencies in this study, which may lead to a common bias method (Podsakoff et al., 2003) and were addressed statistically as recommended by Krishnan et al. (2006). Future studies should collect data from project sponsors, team members and other stakeholders to avoid such concerns and enable greater generalizability. Finally, this study analyzed cross-sectional data through SPSS and AMOS. Therefore, longitudinal data using partial least equation modelling with robustness checks may be a fruitful line of enquiry to observe that different project phases require different leadership competencies and types of support from senior management, as well as avoiding any issue of endogeneity.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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