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Research Article

Nonspatial Proximity and Project Team Resilience: The Role of Knowledge Sharing and Team Cohesion

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Project teams often work in a turbulent and uncertain environment, which tends to bring various dilemmas to them over the projects' duration. Resilience makes it possible for project teams to minimize, manage, and mend the damage caused by adversities. The research on project team resilience is emerging, but not fully developed. Many inputs of project team resilience including team composition have attracted less or even no attention. We explored the influence of team composition on project team resilience from the perspective of proximity and discussed the role of knowledge sharing and team cohesion in their relationship. An analysis of 256 responses from Chinese construction project teams shows that (a) cognitive proximity has a U-shaped effect on project team resilience, knowledge sharing, and team cohesion; (b) value and social proximity positively affect project team resilience, knowledge sharing, and team cohesion; (c) knowledge sharing and team cohesion have a positive influence on project team resilience and mediate the relationship between cognitive, value, social proximity, and project team resilience. This study enriches the empirical literature on team resilience, broadens the boundary of project management, team resilience, proximity, and conservation of resources theory, and provides practical suggestions and future direction.

1. Introduction

Project-based organizations (PBOs) are popular in engineering, IT, aerospace, and industries, as project-based configuration makes the organization more flexible so that the organization can respond to sophisticated customer needs in time and overcome the traditional obstacles of innovation and organizational change [1]. The main body of PBOs consists of project teams that are established temporarily for specific tasks [2]. These teams' working environment tends to be turbulent, complex, and full of uncertainty [3], and they will inevitably face adversities from chronic stressors (i.e., project time pressures and relationship conflict) to sudden shocks (i.e., equipment failure and natural disaster) [3, 4]. To ensure projects succeed under these adversities, project teams should develop the capacity [4] to address setbacks, conflicts, or any other threat [5] calmly and "bounce back" soon, that is, team resilience.

In recent years, there has been an increasing interest in team resilience, as it makes the team possible to succeed in difficulties and stresses. Since COVID-19, the discussion about team resilience is particularly heated. Emerging researches have explored its antecedents, including team leaders [6, 7], team culture or climate [8, 9], team process [2, 9, 10], team psychology [3], and emotion [9], whereas the team composition element has attracted less attention. This study aims to reduce the research asymmetry and focus on cognitive proximity, value proximity, and social proximity between team members. Teams are composed of a variety of members, whether these members have similar knowledge backgrounds, values, or have known each other, relate to team operation and state [11, 12]. According to proximity theory, these nonspatial proximity dimensions are important for knowledge flowing and unit stickiness that helps positive states such as coordination, innovation, and performance [11, 13]. Team resilience, as one of the positive team states, may also be influenced by nonspatial proximity, but few studies investigate their relationship, unlike regular, stable teams, project teams gather individuals together for a short and provisional period. Cognitive, value, and social

proximity may play more important roles in such a context because they are often involved in building rapid trust which is necessary for project teams fighting against hardship. Therefore, the first question this study tried to answer is how nonspatial proximity affects project team resilience.

To further explore the internal path between nonspatial proximity and project team resilience, we followed Hobfoll et al.' calls, combining the conservation of resources (COR) theory and crossover model for analysis. COR theory points out that team resilience capacity emerges from environments that are "(a) rich in personal, social, materials, and energy resources, (b) allow access to those resources, and (c) provide safety and protection against resource loss and promote resource growth" [8], which can be cultivated by resource crossover including knowledge resource crossover (i.e., knowledge sharing) and psychological resources crossover (i.e., team cohesion). In another word, the mechanism of resource exchange at the team level like knowledge sharing and team cohesion may be the foundation for creating and facilitating resilient teams [14]. Furthermore, COR theory and crossover model indicated that the intersection of resources is fertilized by team ecological conditions or the so-called resource passageways. Connecting these discussions to the key principles of proximity theory, we argued that nonspatial proximity functions are not only a resource but also a resource passageway of project team resilience, considered knowledge sharing, and team cohesion as the process of knowledge, and psychological resource crossover for project team resilience, separately. Accordingly, the second question we tried to answer is how knowledge sharing and team cohesion mediate the relationship between nonspatial proximity and project team resilience.

To answer the above two questions, we construct a research model of nonspatial proximity affecting project team resilience, in which knowledge sharing and team cohesion are conceptualized as mediators. After that, we tested the assumptions in the research model by questionnaire data from Chinese construction project teams. In doing so, we make four theoretical contributions. First, we respond to the calls to study resilience at the team level in projects [4] and prosper the knowledge on project team resilience. Second, we make a pioneering attempt to study team resilience with proximity theory, which widens the theoretical perspective of team resilience. Third, we answer the calls for analyzing proximity at the cross-individual level [15], confirm dimensions and their definitions, and provide individual and resilience insights for expanding proximity theory. Fourth, we respond to the initiative of Hobfoll et al. [14] to enlarge the application of conservation of resources theory by using the crossover model and explain how individual knowledge and psychology resources produce resilient project teams.

2. Theoretical Background

2.1. Nonspatial Proximity. The concept of "proximity" originated from the "agglomeration economy" notion puts forward by economist Marshall in 1890. It focused on the impact of spatial agglomeration on enterprise production and had been widely used in the field of industrial economics.

Subsequently, the connotation of proximity was further developed and expanded from one dimension to multidimension by "environmental innovation" theory and "proximity dynamics" theory and a wave of research on multidimensional proximity arose. Nonspatial proximity dimensions attracted more and more attention and even were regarded as more powerful than spatial proximity in interactive learning, knowledge transfer, cross-organizational collaboration, and organizational innovation [11]. The attention to nonspatial proximity also made proximity theory more widely used. Gradually, the researches on nonspatial proximity are no longer limited to the cross-organization level but extend down to the cross-individual level which is what we study.

There are no widely accepted dimensions of nonspatial proximity between individuals. Richard et al. (2021) divided it into two dimensions: cognitive and social proximity, while Hung et al. [11] believed that nonspatial proximity consists of organizational, institutional, and cognitive proximity. Their dimensions are both modified based on dimensions proposed by Boschma [16] at the cross-organization level including cognitive, organizational, institutional, and social proximity. Cognitive proximity means to the "degree of similarity of the knowledge bases" ([67]; [16]; organizational proximity requires agents to belong to the same relational network [16]; institutional proximity is derived from common norms and values between agents [11]; social proximity refers to socially embedded relations between agents at the microlevel [16]).

Among these dimensions, organizational proximity has great overlap with social proximity, they both highlight the role of connections, and many later studies combined the two. Compared with organizational proximity, the concept of social proximity can better reflect team members' relationships, and then, social proximity is selected as the research dimension here. Furthermore, the default premise of institutional proximity is the existence of different organizations. When the team members come from a common organization, the discussion is meaningless. We then eliminate norms and only retain the description of the similarity of values in institutional proximity. To sum up, we divide the nonspatial proximity among project team members into cognitive, value, and social proximity.

Cognitive proximity here is the degree of similarity of project team members' knowledge bases ([67]; [16]. Team members with similar educational background or work experience have fewer communication barriers [11], but they are difficult to get more thought sparks from other areas. In some situations, a certain degree of cognitive proximity may lead to subgroups [17] which is harmful to team united. For these reasons, there is still great controversy about whether cognitive proximity plays a positive or negative role, although its influence on knowledge sharing [11], decision-making [12], cooperation, conflict [12], or innovation [11] has been already investigated.

Value proximity is the degree of similarity of project team members' values [18]. According to organizational

behavior theory, value is the root element that controls an individual's behaviors and attitudes. The effect of value on team process and performance has attracted much attention, and many studies indicate that the similarity of values contributes to a good relationship and promote communication and cooperation between team members, while the heterogeneity of values may lead to conflict and reduce members' satisfaction and identity with the team, which is harmful to the team outcomes [13, 19].

Social proximity is socially embedded relations based on previous friendship, kinship, and experience between project team members [16]. Social proximity coexists with trust, can effectively reduce transaction costs and improve the transaction rate in the process of social transaction, and provide a relationship path for communication and cooperation among agents [11]. It has great significance for reducing risk and uncertainty in the process of technological progress. However, there are also some arguments that social proximity may lead to relationship locking and opportunistic behavior for long-term cooperative organizations, which makes the cost higher on establishing new contacts and acquiring new knowledge. In the project context, it is not clear whether social proximity will play a positive or negative role.

2.2. Project Team Resilience. Resilience originates in "resilire," which is a Latin word interpreted as "jump back" [3, 20]. It is usually considered as an ability to recover or bounce back from adversities. In fact, resilience is regarded as an important concept to explain how individuals, teams, or organizations successfully adapt to negative events [20]. A great many efforts have been made to discuss resilience at the individual, and organizational level for a long time, while team resilience has attracted widespread regard only in the last few decades [7] and is especially hot now [3].

There are many perspectives to explain team resilience including capacity, process, outcome, among which the most recognized is the argument that regarded team resilience as a kind of potential ability for the team to deal with frustration and stressors in an emergency [4], attaches importance to resource possession [8]. Following the view of capacity, project team resilience is defined "as the capacity to anticipate, contain, and recover from adversity or failure induced by the uncertainty and complexity of a project environment" [4]. According to this, project teams with high resilience can actively observe environmental changes, give early warning, and make good preparations for crises to minimize damage before adverse events, make rapid decisions and various solutions to deal with adversities in time, maintain the project's basic functions during adverse events, and recover from pressure, disasters, or other difficulties quickly after adverse events [7].

In terms of the research themes, the inputs of project team resilience are attracting more and more interest. For example, Varajao et al. [21] believed that trust and solidarity, focus on results, commitment, management and accountability, embracing conflicts, work conditions, skills, and behaviors are important contributors to project team resilience. Pavez et al. [4] empirically proved group potency and interpersonal trust are team resources in building project team resilience. Abraham Carmeli et al. [2] indicated that relational coordination drives project team resilience and problem solving through experiential learning and access to knowledge. Although the research on the antecedents of project team resilience is rising, the relevant empirical studies are still rare. We have not found any research on testing the impact of proximity on project team resilience.

2.3. Conservation of Resources Theory and Crossover Model. The basic principle of COR theory is that individuals have the motivation to protect their existing resources and obtain new resources [8]. Resources are things that individuals believe contribute to the achievement of their goals, such as knowledge and positive psychology [8]. The possession of these resources is an integral part of resilience [14], as adequate resources are needed to support coping with pressures and challenges. By contrast, the lack and loss of resources lead to difficulties for individuals to deal with crises and stressors and make individuals choose to withdraw before difficulties to avoid further loss of resources, resulting in vulnerability [14]. According to this, COR theory has frequently been used to explain the development of individual resilience [8, 14].

Gradually, COR theory has been widened from the individual level to the team and organization level. The availability of team resources is also regarded as an important condition for team resilience. Teams' knowledge and psychology resources mainly come from team members. It has been a problem that is not valued by COR theory how to transfer these resources from individuals to teams until Hobfoll et al. [14] discussed COR theory by crossover model. The crossover model holds that individuals' resources can be exchanged and crossed into teams. For example, a member's positive psychology state may infect others in the team and gradually spread to the whole team, and knowledge can be transferred to others and then flow in the team. These processes of resource crossover at the team level increase resource stock and create and sustain resilient teams. The exchange of resources is affected positively or negatively by the team conditions, which is called resource passageways [14]. In another word, resource crossover can help teams use resource passageways to develop and enhance team resilience. According to these, we believe that the path of team resilience development can be from resource passageways to resources crossover. The resource passageway here is nonspatial proximity, and the mechanisms of resources crossover are knowledge sharing and cohesion.

Knowledge is an important resource for any team or organization [11, 22, 23]. Knowledge sharing here refers to actors providing or receiving knowledge such as task information, know-how, and feedback [24], which is a knowledge crossover process, that highlights the frequency of knowledge interaction. This is different from knowledge transfer which emphasizes the effect of knowledge exchange. Knowledge sharing contributes to the knowledge resource

creation and accumulation, enabling teams or organizations to get a variety of benefits including decision-making, reduction of reinventing the wheel, innovation, performance, and other competitive advantages [11, 22, 25]. Therefore, knowledge sharing attracts more and more attention. Several enablers and barriers of knowledge sharing have been identified, such as the motivations and capacities of knowledge sources and receivers, trust, culture, leadership, the categories of knowledge, and so on [26–28]. In general, these influencing factors mainly come from the characteristics of sources and receivers, the characteristics of the relationship between sources and receivers, and the characteristics of knowledge [15]. As a kind of property of the relationship between sources and receivers, proximity has been given a growing concern.

Cohesion is regarded as "a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs" [29], emphasizes the resultant force formed by the individual's willingness of staying in the organization, and reflects the crossover process of individuals' commitment psychology resources. As a preeminent concern in psychology and team research, team cohesion has received a lot of attention and discussion, especially in sports teams and project teams. It is supposed to be a powerful predictor of a positive act, capability, and state, which will have a far-reaching influence on the effectiveness and overall performance of teams [5, 30]. Given this, scholars and practitioners have investigated the development of team cohesion [31]. Generally, the factors affecting team cohesion are organized in four aspects: interpersonal, structural, organizational, and situational factors. Among them, as one of the interpersonal factors, the similarities and attractions between team members are considered to be the most important factor in team cohesion.

3. Hypothesis Development

3.1. Nonspatial Proximity and Project Team Resilience. Social identity theory and similarity-attraction paradigm believe that high proximity enables individuals to communicate easily and cooperate effectively, which will contribute to a quick decision and action to crisis response. However, there are voices declaring proximity hinders creative, innovative ideas, and diversified solutions to adversities, and this negative effect is mainly reflected in job-related proximity [32–35]. It can be seen that cognitive proximity which relates to similar task-related knowledge and skills may have both positive and negative effects on resilience, while the impact of values proximity and social proximity on resilience may show a more positive side.

In project teams with lower cognitive proximity, the knowledge gap between team members will be shrinking with the increasing of cognitive proximity, but still large, which avoids quick common understanding for crisis response plans. Meanwhile, project teams' heterogeneous knowledge resources will be decreasing which is harmful to teams monitoring environmental changes from several insights, and coping with the adversities through various solutions. In other words, cognitive proximity is negatively correlated with project team resilience at lower levels. As cognitive proximity increases to a certain level, its advantages will become more and more obvious until it surpasses its negative effects. With similar knowledge backgrounds at higher cognitive proximity, team members can not only have a more professional and in-depth discussion on the dilemma but also reach an agreement on the contingency plans quickly, so that the duration of the adverse impact on project teams minimizes.

> Hypothesis 1a: cognitive proximity has a U-shaped effect on project team resilience

Brodsky et al. [36] identified shared values as one of the resilience processes at the organization level. Varajao et al. [21] indicated that common values can shape a group structure conducive to project team resilience. Consist with the above ideas, value proximity may positively affect project team resilience. Team members with similar values often hold strong beliefs for the development direction of the project and the project team. As such, project teams can effectively resist the negative impact of severe conditions on their goals and morale. Furthermore, value proximity avoids the prejudice introduced by inner dissimilarity and makes it easy for team members to identify with each other and form working tacit understanding in a short term [13]. This will help team members carry out emergency actions collectively, facilitating the efficiency of "bounce back".

> Hypothesis 1b: value proximity has a positive effect on project team resilience

Project teams are set up temporarily, and team members know each other well in advance and are conducive to projects surviving in the turbulent environment [37]. High social proximity often brings good relationship, because project team members with prior social connections show more trust with each other. High relationship quality has been recognized as the most evident condition to improve team resilience [38], as it not only provides emotional support for team members to resist pressure from adversities but also enhances mutual assistance between team members when facing hardship. Moreover, project team members in similar social networks prefer to interact. High social interactions density promotes the emergence of team resilience [37] since frequent communication produces effective teamwork and efficient problem-solving for addressing stressors. Subsequently, project team resilience may emerge from social proximity which is closely related to high social capital.

> Hypothesis 1c: social proximity has a positive effect on team resilience

3.2. Nonspatial Proximity, Knowledge Sharing, and Project Team Resilience

3.2.1. Nonspatial Proximity and Knowledge Sharing. The emergence of knowledge sharing is not easy because of

individuals' tendency of knowledge protection and the cost of exchanging knowledge. The similarity of knowledge base, values, and social network has a profound and lasting influence on removing these obstacles [15].

When the level of cognitive proximity is extremely low, highly heterogeneous knowledge is embedded in project participants. Project team members have no choice but to provide their own skills, techniques, and experiences and learn from each other because dealing with complex project tasks in a limited duration requires rapid integration of heterogeneous knowledge. Otherwise, the project cannot continue normally. With the increase in cognitive proximity, the passive force of knowledge sharing is decreasing. When cognitive proximity exceeds a certain level, although team members have less obligation to share knowledge, their willingness for sharing knowledge becomes gradually strong. The reason is that team members with similar educational or work backgrounds are more likely to resonate with technique or management difficulties, which enhances their desire to exchange information and ideas [15].

> Hypothesis 2a: cognitive proximity has a U-shaped effect on knowledge sharing in project teams

Project team members tend to hide knowledge in their initial contact with others because of vigilance. Value proximity can help to solve this problem by breaking the defensive barriers between team members. According to the similarity-attraction paradigm, team members who share common goals, beliefs, and attitudes are more likely to attach and commit to each other, even willing to sacrifice their own interests for the other [39, 40]. That is, similar values produce a strong interpersonal attraction [41], with which team members are more likely to help their fellows by various means without regarding costs, including sharing their knowledge [42]. Furthermore, the similarity-attraction paradigm also asserted that people are eager to communicate and interact with someone who has inner similarities, which provides a good condition for knowledge sharing [43, 44].

> Hypothesis 2b: value proximity has a positive effect on knowledge sharing in project teams

Christensen et al. [15] found the positive influence of social relationship on knowledge sharing frequency. Recently, Carmeli et al. [2] argued that experiential learning and access to knowledge are socially driven. Project team members may prefer to share knowledge with people they have known before. First, social connectedness involves trust is good for the reduction of social costs in the process of knowledge sharing. Second, project team members embedded in the same relation network know well with each other, and they can express their knowledge in a way that is easier for colleagues to understand; meanwhile, they know who possesses the knowledge they want and obtain it targeted, so as to reduce the time cost of knowledge sharing [15]. Third, team members with common experiences are more likely to associate with each other [45], which increases the probability of knowledge flow, especially the tacit knowledge (i.e., expertise, ideas, and opinions) that resides in individuals' minds [2].

> Hypothesis 2c: social proximity has a positive effect on knowledge sharing

3.2.2. Knowledge Sharing and Project Team Resilience. Minimizing, managing, and mending adversities for a team depend on a lot of experiences and knowledge resources [7]. Different from traditional teams, the knowledge resources of project teams accumulate less because they are often established for a short time. Most of the knowledge resources are held by team members.

Knowledge sharing is an efficient crossover process to integrate knowledge from team members to project teams and create new knowledge [46], enabling project teams to stock and deploy knowledge resources to address adversities. First, knowledge sharing leads to knowledge collision and integration and, by extension, provides project teams a broader knowledge perspective to identify potential risks from outside and inside projects, and enriches project teams' innovative ideas to make accurate and efficient emergency measures. Secondly, the knowledge sharing process helps the project team understand and apply knowledge, so as to achieve high efficiency and performance of emergency preparedness and crisis solution. Zhang et al. [46] argued that sharing tacit knowledge contributes to construction project teams' flexibility and ensures that project teams can survive the challenge and dynamic conditions.

> Hypothesis 3: knowledge sharing has a positive effect on project team resilience

3.2.3. The Mediation Role of Knowledge Sharing. Knowledge sharing is an essential means of team knowledge accumulation and innovation, which is of great significance for the project team to find, prevent, deal with, and recover from adversities. There are some hinders blocking the way of knowledge sharing, while nonspatial proximity provides a passageway for it. So, it is a possible path that nonspatial proximity acts on project team resilience through knowledge sharing.

Specifically, the passive power of heterogeneous knowledge interaction will gradually weaken under lower cognitive proximity, in turn, inhibiting project teams generate flexible and diverse solutions. With the increasing cognitive proximity, project team members actively share knowledge and make a deeper understanding of existing knowledge, which then promotes project teams' reaction efficiency and effectiveness. Value proximity produces attraction and frequent communication. These profits make up the costs of knowledge sharing and provide more possibilities for knowledge interaction, through which project teams have more ideas to deal with and a strong ability to carry out complex and dynamic tasks during the recovery process. Social proximity clears knowledge sharing obstacles by reducing transaction costs and improving contact and increasing knowledge sharing behavior which in turn enhances the capacity of project teams to bounce back from adversities. Hung et al. [11] indicated that knowledge sharing can mediate the relationship between nonspatial

proximity and team abilities such as innovation, which reinforce the hypothesis that knowledge sharing may play a mediation role between nonspatial proximity and project team resilience.

Hypothesis 4a: knowledge sharing plays a mediation role between cognitive proximity and project team resilience

Hypothesis 4b: knowledge sharing plays a mediation role between value proximity and project team resilience

Hypothesis 4c: knowledge sharing plays a mediation role between social proximity and project team resilience.

3.3. Nonspatial Proximity, Team Cohesion, and Project Team Resilience

3.3.1. Nonspatial Proximity and Team Cohesion. Project teams need to develop cohesion in a short time to promote team members' coordination on work as soon as possible. Cognitive, value, and social proximity between team members provide ecological conditions for team cohesion.

From the perspective of knowledge categorization, project teams with moderate cognitive proximity may have low teamwork and unity because of the easy appearance of subgroup formation, while very high and low proximity makes groups better cohesion as subgrouping is less likely to occur in such a state [17, 35]. From the perspective of knowledge itself, extreme low cognitive proximity brings project teams' diverse knowledge. In such a team, team members not only are respected for their own exclusive expertise but also can learn much new knowledge from their colleagues, which makes them feel included, valued, and satisfied, enhancing their commitment to the team [47]. Team members with extremely high cognitive proximity have smoother task-based communication and can resonate with the problems existing in the project, and this helps them stick together to finish project goals. However, team members with moderate cognitive proximity have neither enough affective needs satisfaction nor enough task-related needs satisfaction to keep united, and fall into the trap of being "stuck in the middle."

Hypothesis 5a: cognitive proximity has a U-shaped effect on team cohesion

The consistency of group members in values and goals plays an important role in promoting project team cohesion [48]. Firstly, according to social identity theory, value proximity is conducive to the improvement of interpersonal attraction, and a good relationship promotes team members to unite together. Secondly, members with similar values have much in common and can quickly establish emotional connections. This emotional dependence enhances team members to stick together. Thirdly, team members with similar beliefs and ideals often have common views about project objectives and tasks, which leads to less conflict and more coordination on the project tasks. The harmony at work contributes to the cohesion of project teams [41]. Webber et al. [17] indicated that the similarity values, beliefs, and attitudes positively affect workgroup cohesion, which also provides an argument for our inference.

Hypothesis 5b: value proximity has a positive effect on team cohesion

Project team members gather together temporarily for a specific project task, and they need to start work quickly after the team is formed. For them, there is less time for knowing and adapting to each other. It is difficult to build strong trust relationships with completely unfamiliar ones since the development of intimate relationships takes a certain amount of time [49]. Relational conflicts are more likely to appear among unfamiliar team members because of weak relationships, which harm the members' unity in accomplishing the project task goals. By contrast, team members with prior social relations have an attachment base. Conservation of resources theory pointed out that a solid resource base can promote the further spiral of this resource. Therefore, the existing social capital will further increase the connections and stickiness between team members, effectively and professionally, thus reinforcing project team cohesion.

Hypothesis 5c: social proximity has a positive effect on team cohesion

3.3.2. Team Cohesion and Project Team Resilience. Morgan et al. [38] regarded group cohesion as one of the resilient characteristics of elite sports teams. Compared with sports teams, project teams have shorter establishment time, less tacit understanding, greater work pressure, and more complex challenges. So, cohesion may be more necessary for project teams to struggle against adversities.

First, the heavy attacks brought by adversities often lead to low morale and make team members' emotions too exhausted to recover from the dilemma quickly. There is the more positive affective atmosphere in project teams higher in cohesion, from which team members can get emotional supplies and have more confidence and courage to fight against difficulties. Second, team members are psychologically loving and committed to each other in cohesive project teams, and they support and depend on each other rather than malign each other, which enables them to be capable of uniting to cross difficult barriers. Third, Braun et al. [30] believed that high cohesion contributes to a common version and teamwork. Based on this view, project teams with high cohesiveness share a more unified objective and schematization for how to rebound from adversities. Further, they can implement emergency measures more efficiently and resist adversities together better.

Hypothesis 6: team cohesion has a positive effect on project team resilience

3.3.3. The Mediation Role of Team Cohesion. Team cohesion emphasizes the psychological crossover of team members, which is mainly reflected in the close social-emotional

bonding and the consistency of task objectives. It is crucial for project team members who have just gathered together to unite against adversities, while the similarity of knowledge, values, and social embeddedness between team members provides the soil for the growth of team cohesion. Thus, team cohesion may be another mediation variable between nonspatial proximity and project team resilience.

In particular, when cognitive proximity is moderate, subgroups will appear in project teams. Furthermore, team members will possess less emotional commitment brought by knowledge uniqueness and less team identity brought by knowledge similarity. At this time, project teams are loose, full of conflicts, and have low emergency capacity. In contrast, when cognitive proximity is very low or high, subgroups are difficult to form, and team members satisfy with the team or communicate smoothly, which enables them to make efforts to project recovery and hang together to defeat adversities. Value proximity contributes to better intrateam relationships, team members' resonance, and a common version of project tasks, further enhancing team members to make a quick decision on crisis response scheme and coordinate on actions to fight against stressors. Team members with social proximity communicate and interact more frequently, which will produce more intrateam connections and stickiness. As such, project teams get more determination to overcome difficulties and the ability to break the dilemma quickly.

> Hypothesis 7a: team cohesion plays a mediation role between cognitive proximity and project team resilience
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> Hypothesis 7b: team cohesion plays a mediation role between value proximity and project team resilience
>
> Hypothesis 7c: team cohesion plays a mediation role between social proximity and project team resilience.

As shown in Figure 1, we built a research model based on the above hypotheses. In this model, cognitive proximity, value proximity, and social proximity are considered as independent variables, and project team resilience is regarded as a dependent variable, while knowledge sharing and team cohesion are represented as mediating variables.

4. Method

We tested the above hypotheses by questionnaire survey method, and structural equation modeling (SEM) except for the U-shaped indirect effect test since there is no widely accepted SEM for it. SEM incorporates unobservable variables and can effectively control the measurement error, thus estimating the direct and indirect effects more accurately [50].

4.1. Sample and Data Collection. We chose Chinese construction project teams as a data source. Construction project teams are formed temporarily, in which team members' knowledge structure and values may be similar or heterogeneous [51], and they may have known each other before or not. Construction project teams have a high demand for resilience to bounce back from lots of challenges such as natural disasters and time pressure. We distributed surveys online and face-to-face to construction project participants by the nonprobabilistic sampling method. We sent 340 and received 298 questionnaires with a recovery rate that is 87.65%. After excluding the invalid samples such as the missing answers and the same answers, we got 256 valid questionnaires with a valid response rate that is 75.29%. The details of the samples can be seen in Table 1.

4.2. Measures. Most of the items were selected from the existing research. The sources of the constructs and items are displayed in Table 2 (see Appendix for measure details). We modified the wording of the items to make them more suitable for the project context. Participants should answer each item with a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Then, we invited three experts in the field of project management, two experts who specialized in organizational behavior, and nine construction project practitioners with more than five years of working experience to check and revise the items. After that, we distributed 65 questionnaires for preinvestigation and further improved the items according to the response results, so that the respondents could better understand what we want to ask.

Finally, cognitive proximity is measured by three items that are similar educational backgrounds, similar work backgrounds, and similar function/domains. Similar educational backgrounds refer to the similar major or learning environment. Team members with similar work backgrounds tend to have similar professional experience. Similar function/domains mean close functional area.

Value proximity is developed by four items that are similar life values, similar work values, similar goals, and agreeing on what is important to the team. Similar life values refer to team members holding similar fundamental views when recognizing and evaluating the value attributes of life activities. Similar work values mean that team members have similar value preferences for work and work-related aspects of the team. Similar goals mean team members have a close intended purpose. Team members agree on what is important to the team further reflects the similarity of their ideas and orientation.

Social proximity measures assess team members who have common experiences previously, know each other previously, have friendship previously, trust each other previously, and have heard of each other's stories previously, and each item reflects the previous embedded relations between project team members.

Knowledge sharing is measured by five items. Project team members should answer if they frequently share official documents or manuals, project knowledge, technical skills, managerial expertise, communication, or negotiation skills with teammates. Project knowledge refers to project implementation-related knowledge, such as site conditions, project status, and client requirements. Technical skills refer to methods, procedures, processes, or skills specific to a task. Managerial expertise, communication, or negotiation skills

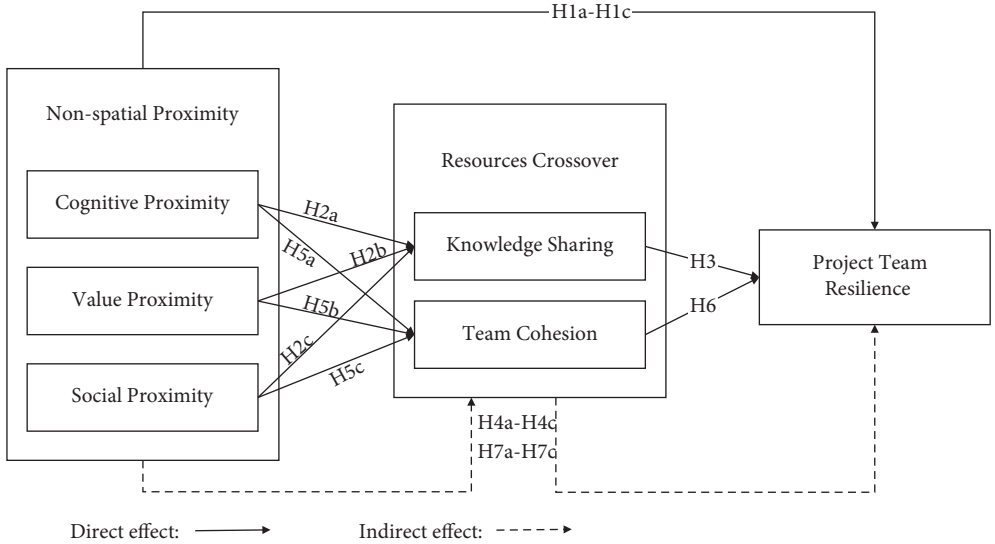

Figure 1: Research model.

Table 1: Sample description.

Category	Classification	Number of samples	Proportion (%)
Age	24 or less	22	8.59
	25–30	121	47.27
	31–40	85	33.20
	41–50	20	7.81
	51 or more	8	3.13
Position	Senior managers	68	26.56
	Middle managers	114	44.53
	Common employees	74	28.91
Project classification	Housing construction	84	32.81
	Railway projects	58	22.66
	Highway project	42	16.41
	Municipal engineering	49	19.14
	Other	23	8.98
Project team size	1–15 team members	94	36.72
	16–50 team members	104	40.63
	More than 50 team members	58	22.66
Planned duration	0-1 years	36	14.06
	1–3 years	153	59.77
	3–5 years	57	22.27
	More than 5 years	10	3.91

are presented in soft skills, such as progress control expertise.

Team cohesion is developed by five items. Project team members should answer if they contribute to the discussion and cooperate to get the work done, if there is an atmosphere of unity and fraternity in their project team, if they believe that teammates will do their fair share of the work, and if they enjoy working with teammates. The first two items reflect the unity in terms of members' behavior, the third one is involved in a team context, and the fourth and fifth items assess team cohesion from the perspective of members' beliefs.

Project team resilience is measured by seven items. Project team members should answer if their team can maintain high situational awareness at all times, if they cope well with the conflicts, pressures experienced at work, if they can provide a quick response to tensions or crises events, if their team always manages to find effective solutions, can maintain the main functions of the project, and quickly return to normal work. The first item emphasizes prevention before adversities. The next five items focus on defending during adversities. The last item emphasizes recovery after adversities.

4.3. Data Analysis

4.3.1. Common Method Biases. We carried out the method named controlling for the effects of an unmeasured latent methods factor [60] to assess the risk of common method

Table 2: Variables and their sources.

Variable	Item number	References
Cognitive proximity (CP)	3 (CP1-CP3)	Jaiswal and Dyaram [47], Cristian et al. [52]
Value proximity (VP)	4 (VP1-VP4)	Jehn et al. [53]
Social proximity (SP)	5 (SP1-SP5)	Cristian et al. [52]
Knowledge sharing (KS)	5 (KS1-KS5)	Zhang et al. [54]
Team cohesion (TC)	5 (TC1-TC5)	Hogg [55], Michalisin et al. [56], Chiniara et al. [57], Wendt et al. [58]
Team resilience (TR)	7 (TR1-TR7)	Pavez et al. [4], Ambulkar et al. [59]

bias by Amos21.0. We loaded all items on theoretical constructs, as well as on a latent common methods variance factor, and compared its structural parameters with the model with items on theoretical constructs only. As a result, the difference between the latter ($\chi 2 = 781.552$, df = 362, $\chi 2/\mathrm{df} = 2.159$, CFI = 0.93, RMSEA = 0.067) and the former ($\chi 2 = 633.76$, df = 333, $\chi 2/\mathrm{df} = 1.903$, CFI = 0.95, RMSEA = 0.060) is not significant, which means that the common method bias was not a concern in this study [60].

4.3.2. Confirmatory Factor Analysis. To assess the model quality, we carried out a confirmatory factor analysis using Mplus8.0. As shown in Table 3, the factor loadings of all items are greater than 0.6, the Z-values are greater than 1.96, and the P values are less than 0.001. The constructs have a strong explanatory ability to their items (R-square>0.36). The items of every construct have strong internal consistency, with the composite reliability (CR) being more than 0.7, and the average interpretation ability of all constructs being strong, with the average variance extracted (AVE) being more than 0.5 [61]. It can be seen that all constructs have good reliability and convergence validity.

To test discriminate validity, a construct correlations table was constructed in which the items on the diagonal represent the square root of AVE (see Table 4). The square root of AVE exceeds the correlations between constructs, which means that there is no multicollinearity between dimensions, and the discriminate validity is good [62].

4.4. Hypotheses Test

4.4.1. Linear Effect Test

(1) Linear direct effect test. A structural equation model 1 of the linear effect between value proximity, social proximity, knowledge sharing, team cohesion, and project team resilience in Mplus8.0 is built. The model fit is so good, with $\chi 2/\mathrm{DF} = 2.4148$, CFI = 0.928, TLI = 0.920, RMSEA = 0.074, SRMR = 0.045, and that model 1 is acceptable. The test results are shown in Table 5. The positive effects of value proximity, social proximity on knowledge sharing, team cohesion, and project team resilience are significant, as well as the effect of knowledge sharing and team cohesion on project team resilience. H1b, H1c, H2b, H2c, H5b, H5c, H3, and H6 are accepted.

(2) Linear indirect effect test. We used bootstrap by Mplus8.0 to test the mediating effect of knowledge sharing and team cohesion. As shown in Table 6, the corresponding P values of the mediating effect of knowledge sharing and team cohesion between value proximity, social proximity, and project team resilience are less than 0.01 or 0.001, respectively. The Z-values are all greater than 1.96.0 which is not included in the confidence interval in the bias and percentile test, so the mediating effects of knowledge sharing and team cohesion between value proximity, social proximity, and project team resilience are significant. H4b, H7b, H4c, and H7c are supported.

4.4.2. U-Shaped Effect Test

(1) U-shaped direct effect test. The square of cognitive proximity was generated by the means of latent moderate structural equations provided by Klein et al. [63]. We used Mplus8.0 to construct model 2 including cognitive proximity and its square, project team resilience, knowledge sharing, and team cohesion. It is necessary to investigate the model 2 fit before the hypotheses test. However, Mplus8.0 cannot provide commonly used fitting index values such as RMSEA, CFI, and TLI if LMS is executed. To solve this problem, Sardeshmukh and Vandenberg [64] suggested building a benchmark model 2^* without square terms and investigating its fit. If model 2^* fit is acceptable and the AIC value is larger or equal than the AIC value of model 2, model 2 is acceptable. Model 2^* fit this study is accepted with $\chi 2/\mathrm{DF} = 2.241$, CFI = 0.951, TLI = 0.944, RMSEA = 0.070, SRMR = 0.039, and its AIC value (9344.176) is larger than model 2 (9324.473), which proved model 2 is acceptable. In model 2, the positive effects of the square of cognitive proximity on team resilience, knowledge sharing, and team cohesion are significant as shown in Table 5. We then preliminarily judged that the U-shaped effect exists.

To further verify our judgment, we followed a three-step U-test procedure proposed by Lind et al. [65] to test the U-shaped effect using STATA 16.0, and the results can be seen in Table 7. We tested the relationship between cognitive proximity and project team resilience, knowledge sharing, team cohesion. As a result, (a) the square term's $P > |t|$ values are less than 0.0001; (b) the slopes are negative and positive numbers at a minimum and maximum data of cognitive proximity and are significant in the 95% confidence interval; (c) the turning points of cognitive proximity locate in the data ranges, which proves that the U-shaped relationships between cognitive proximity and project team

Table 3: Reliability and convergence validity.

Dim.	Item	Parameters of significant test			Item reliability		Composite reliability	Convergence validity
		Estimate	S.E.	Z-value	*P*-value	R-square	CR	AVE
Cognitive proximity	CP1	0.716	0.038	18.671	***	0.513	0.837	0.634
	CP2	0.767	0.036	21.402	***	0.588		
	CP3	0.895	0.032	28.287	***	0.801		
Value proximity	VP1	0.814	0.028	28.964	***	0.663	0.874	0.635
	VP2	0.879	0.025	35.298	***	0.773		
	VP3	0.764	0.035	21.778	***	0.584		
	VP4	0.722	0.039	18.728	***	0.521		
Social proximity	SP1	0.855	0.021	40.921	***	0.731	0.913	0.677
	SP2	0.825	0.024	34.991	***	0.681		
	SP3	0.887	0.018	49.470	***	0.787		
	SP4	0.793	0.027	29.544	***	0.629		
	SP5	0.746	0.031	23.903	***	0.557		
Knowledge sharing	KS1	0.787	0.027	28.725	***	0.619	0.912	0.675
	KS2	0.801	0.026	30.714	***	0.642		
	KS3	0.892	0.017	51.539	***	0.796		
	KS4	0.883	0.018	48.821	***	0.780		
	KS5	0.733	0.032	22.986	***	0.537		
Team cohesion	TC1	0.799	0.030	26.626	***	0.638	0.921	0.701
	TC2	0.857	0.024	35.652	***	0.734		
	TC3	0.826	0.027	30.328	***	0.682		
	TC4	0.801	0.030	26.699	***	0.642		
	TC5	0.900	0.019	46.196	***	0.810		
Project team resilience	TR1	0.715	0.033	21.904	***	0.511	0.942	0.698
	TR2	0.825	0.022	37.007	***	0.681		
	TR3	0.873	0.017	49.900	***	0.762		
	TR4	0.850	0.020	43.181	***	0.723		
	TR5	0.874	0.017	50.964	***	0.764		
	TR6	0.839	0.021	39.867	***	0.704		
	TR7	0.860	0.019	45.278	***	0.740		

Note: ***means that *P* values are less than 0.001.

Table 4: Construct correlations.

	CP	VP	SP	KS	TC	TR
CP	0.796					
VP	−0.096	0.797				
SP	−0.097	0.490	0.823			
KS	−0.061	0.561	0.649	0.821		
TC	−0.118	0.616	0.650	0.636	0.837	
TR	−0.122	0.628	0.656	0.672	0.780	0.835

Note: the diagonal elements are the square root of the AVE of a respective construct.

resilience, knowledge sharing, team cohesion are significant, and H1a, H2a, and H5a are accepted.

(2) Instantaneous indirect effect. The widely accepted method to test the nonlinear mediating effect is calculating the θ value of the instantaneous indirect effect proposed by Hayes et al. [66]. Following this, we calculated the instantaneous mediating effect of knowledge sharing and team cohesion between cognitive proximity and team resilience, when cognitive proximity was the average value and its plus or minus standard deviation, respectively. That is, we tested the significance of the instantaneous mediation effect by calculating the indirect change rate θ of $\partial M(X)/\partial X \times \partial Y(X, M)/\partial M$ when X is $\overline{x} - \sigma$, $\overline{x}$, and $\overline{x} + \sigma$, respectively.

Table 5: Linear direct effect test.

Hypothesis	Estimate	S.E.	Est./S.E.	*P*-value
VP-TR (H1b)	0.163	0.059	2.746	**
SP-TR (H1c)	0.153	0.065	2.371	*
VP-KS (H2b)	0.329	0.06	5.504	***
SP-KS (H2c)	0.497	0.056	8.947	***
VP-TC (H5b)	0.396	0.056	7.103	***
SP-TC (H5c)	0.465	0.054	8.642	***
KS-TR (H3)	0.196	0.064	3.048	**
TC-TR (H6)	0.461	0.064	7.173	***
CP2-TR (H1a)	0.302	0.067	4.496	***
CP2-KS (H2a)	0.303	0.084	3.612	***
CP2-TC (H5a)	0.226	0.075	3.028	**
CP2-TR (H1a)	0.302	0.067	4.496	***

Note. *** means that *P* values are less than 0.001, ** means that *P* values are less than 0.01, and *means that *P* values are less than 0.05.

Table 8 shows that when cognitive proximity changes from $\overline{x} - \sigma$ to $\overline{x}$, and knowledge sharing's θ value changes from -0.219 to −0.01, the confidence interval appears "cross-zero", indicating that the reverse instantaneous intermediary role of knowledge sharing has experienced a process of "from presence to absence." When cognitive proximity increases from $\overline{x}$ to $\overline{x} + \sigma$, knowledge sharing's θ value changes from -0.01 to 0.2, and the confidence intervals are greater than 0,

Table 6: Linear indirect effect test.

Hypothesis	Point estimate	Product of coefficient			Bootstrap 1000 times 95%CI			
		S.E.	Est./S.E.	P-value	Bias corrected		Percentile	
					Lower	Upper	Lower	Upper
VP-KS-TR (H4b)	0.092	0.035	2.653	**	0.039	0.178	0.038	0.175
VP-TC-TR (H7b)	0.212	0.054	3.895	***	0.116	0.340	0.115	0.337
TOTAL	0.304	0.066	4.624	***	0.196	0.457	0.196	0.454
SP-KS-TR (H4c)	0.125	0.039	3.233	**	0.059	0.214	0.056	0.210
SP-TC-TR (H7c)	0.224	0.049	4.606	***	0.145	0.335	0.140	0.328
TOTAL	0.348	0.061	5.668	***	0.239	0.480	0.231	0.469

Note: ***means that P values are less than 0.001, and **means that P values are less than 0.01.

Table 7: U-test.

Hypothesis	$P > \|t\|$ value	T-value	Slopes (95%CI)		Turning point	Data range
CP2-TR (H1a)	***	4.14	−0.692***	0.567***	3.197	[2.922, 3.622]
CP2-KS (H2a)	***	5.00	−0.874***	0.863***	3.012	[2.774, 3.275]
CP2-TC (H5a)	***	4.12	−0.861***	0.732***	3.161	[2.883, 3.569]

Note. ***means that $P > |t|$ values are less than 0.001.

Table 8: Test of the instantaneous indirect effect.

Dim.	X (instantaneous indirect effect value θ)	Bootstrap (times)	90% CI		95% CI	
			Lower 5%	Upper 5%	Lower 2.5%	Upper 2.5%
Knowledge sharing	$\overline{x} - \sigma$ (−0.219)	1000	−0.321	−0.133	−0.339	−0.116
		2000	−0.315	−0.131	−0.335	−0.113
		5000	−0.315	−0.130	−0.334	−0.112
	$\overline{x}$ (−0.01)	1000	−0.053	0.036	−0.065	0.041
		2000	−0.055	0.036	−0.065	0.043
		5000	−0.053	0.036	−0.064	0.044
	$\overline{x} + \sigma$ (0.2)	1000	0.113	0.281	0.097	0.296
		2000	0.114	0.282	0.098	0.296
		5000	0.115	0.282	0.097	0.297
Team cohesion	$\overline{x} - \sigma$ (−0.251)	1000	−0.382	−0.126	−0.406	−0.100
		2000	−0.374	−0.123	−0.395	−0.097
		5000	−0.367	−0.116	−0.389	−0.091
	$\overline{x}$ (−0.043)	1000	−0.104	0.013	−0.116	0.024
		2000	−0.102	0.012	−0.11	0.023
		5000	−0.103	0.013	−0.113	0.024
	$\overline{x} + \sigma$ (0.164)	1000	0.052	0.259	0.032	0.275
		2000	0.065	0.264	0.044	0.281
		5000	0.065	0.263	0.045	0.280

indicating that knowledge sharing has an obvious positive instantaneous mediating effect between cognitive proximity and team resilience. Therefore, H4a is partially supported. Involving team cohesion, the changing trend of θ value is consistent with knowledge sharing (see Table 8 for details), so H7a is partially supported.

5. Discussion

Through the analysis above, we found that cognitive proximity has a U-shaped effect on project team resilience, knowledge sharing, and team cohesion. Value proximity, social proximity, knowledge sharing, and team cohesion positively influence project team resilience, and knowledge sharing and team cohesion mediate the relationships between nonspatial proximity and project team resilience. The findings make rich theoretical and practical contributions.

5.1. Theoretical Implications. First, compared with individual resilience and organizational resilience, there are still fewer studies on team resilience, let alone project team resilience. Pavez et al. [4] called for developing team resilience research in the project context. The project-based environment and conditions are unique, can exacerbate, neutralize, or restrict theories [4]. Accordingly, the development of team resilience theory should attach importance to the project context. This study responds to their suggestions and explored team resilience in the project-based

environment, enriching the research on project team resilience.

Second, current researches mostly studied proximity at a cross-organizational level, whereas few studies systematically discussed it between individuals. This study responds to the call of Christensen and Pedersen [15] to expand the proximity theory from the cross-organizational level to the cross-individual level. Based on the focus of team theory, we divided the dimensions of nonspatial proximity of project teams into cognitive proximity, value proximity, and social proximity, giving them new connotations. This provides individual insights for expanding proximity theory.

Third, we followed the suggestion of Pavez et al. [4] regarding project team resilience as a kind of ability, which is mainly reflected in good preparation before adversities, the efficient reaction in adversities, and recovery even improvement after adversities. Based on this, we explored the influence of cognitive proximity, value proximity, and social proximity on project team resilience. The results show that strong project team resilience occurs with low or high cognitive proximity, while moderate cognitive proximity makes project team resilience weak. Values and social proximity predict high project team resilience, as similar values and social embedding produce relationship attraction and frequent communication, to ensure the project team fights against adversities efficiently. This is a pioneering attempt to study team resilience with proximity theory, complements the research perspective of project team resilience from team composition, and broadens the theoretical boundary of team resilience and proximity research.

Fourth, we echoed the call to clarify how resources crossover uses a specific passageway and cultivates team resilience [14]. From the perspective of knowledge resource crossover, the results integrate the negative and positive arguments, indicating that the negative and positive effects of cognitive proximity on knowledge sharing are conditional. Value proximity is shown benefiting knowledge sharing, which confirms the significance of value proximity from the perspective of knowledge. Our results also support the views of Christensen and Pedersen [15] and Carmeli et al. [2] that social proximity is conducive to knowledge sharing because project team members who interact temporarily for a short time are hardly "locked in" a relationship network, and in turn, the quick trust and strong communication willingness brought by social proximity are the keys for knowledge sharing in project teams. Moreover, the results indicate that knowledge sharing stimulated or suppressed by nonspatial proximity helps project teams to develop new ideas and efficient solutions to bounce back from adversities.

From the perspective of psychology resource crossover, we found the U-shaped effect of cognitive proximity on team cohesion, which confirmed the guess of Webber and Donahue [17]. It is proved that value proximity and social proximity are positive antecedents of team cohesion, as they create high interpersonal attraction and stickiness, further promoting unity and cooperation among team members to achieve project goals. In the project context, we proved the predictor role of team cohesion in the emergence of project team resilience, which followed the suggestions of Bowers et al. [20] (2018) to study team resilience from the perspective of team cohesion, and confirmed their inference that team cohesion can improve team resilience. That is to say, either preparation before adversities, the reaction to adversities, or recovery after adversities, psychological resources crossover is indispensable. Moreover, similar to knowledge sharing, team cohesion also plays a partial intermediary role between nonspatial proximity and project team resilience; that is, nonspatial proximity can also affect project team resilience through team cohesion. In conclusion, this study described how nonspatial proximity influences project team resilience through knowledge sharing and team cohesion and provided support for the ideas of Hobfol et al. (2018) using the crossover model on COR theory to explain how individuals' resources contribute to team resilience.

5.2. Practical Implications. Nonspatial proximity is not only one of the resources of team resilience but also an important passageway of knowledge resource crossover and psychology resource crossover. A project team may encounter accidents from the beginning to the end of the project, and we suggest that resources should be ensured throughout the project life cycle [4].

The U-shaped role of cognitive proximity provides a conditional path for team formation. Managers should screen team members according to the needs of the project for heterogeneous knowledge. For example, when the project is relatively simple and does not involve much heterogeneous knowledge, individuals with similar knowledge base can be selected to form a project team, so that they can make quick decisions and reach consensus quickly in case of difficulties, instead of setting up a highly heterogeneous team to sacrifice decision-making efficiency for diversifying ideas. When the project is more complex and involves tasks in multiple fields, managers had better select individuals from different majors and work experience to set up a project team, to ensure that the project team can deal with complex emergencies with diverse knowledge. If the project team has been established, managers should give full play to the advantages of low proximity or high proximity and make up for their disadvantages, such as improving communication and strengthening learning within and outside the team.

High value and social proximity are in favor of knowledge sharing, team cohesion, and project team resilience. Accordingly, the employees' values model should be established through the psychological test, behavioral test, and other means. It is also necessary for managers to learn about the social connections between employees. During the formation of the project team, managers should give priority to selecting employees with similar values and social connections to participate in the project work, on the premise of ensuring the basic needs of the project. This also explains the practical phenomenon that many employees are required to take psychological tests when applying for jobs, and team members in some projects will be sent to another project as a whole after finishing one project. If the project team has been

established, team members' values should be integrated, and the relationship should be strengthened. Holding meets of exchange, organizing various "league building" activities, building communities of practice, etc. are possible ways to shrink the value gap and develop friendships between team members.

Knowledge sharing and team cohesion are significant for project teams curbing adversity or recovering from difficulties, and they are bridges connecting nonspatial proximity and project team resilience. We put forward some practical strategies from the perspective of stimulating knowledge sharing and team cohesion. The first suggestion is to keep an open communication, which is the key to improving relationship quality and enhancing ideological interaction. The methods to implement this practice include setting a flat organizational structure, holding regular meetings, developing team shared leadership, etc. The second suggestion for project managers is to inject emotional care. Projects are often pressed for time, so project team members are under great pressure and prone to emotional exhaustion, which is very unfavorable to knowledge flow and team unity. To mitigate this problem, project managers should keep abreast of the emotional dynamics of the team members, strengthen spiritual motivation, and create a positive emotional atmosphere for team members. The third suggestion is to create a safe atmosphere, encourage team members to speak freely, boldly try, and make mistakes. In such an atmosphere, team members will not be criticized even if they say something wrong; instead, they will be respected for sharing these contents. As such, team members can put forward their views and opinions without reservation and share their experiences and lessons actively, enhancing knowledge sharing and team cohesion.

5.3. Limitations. There are some limitations in this study that should be overcome in future research. First, we collected cross-sectional data for analysis, which is hard to solve the problem of common method bias perfectly though we tried our best. Future research should carry out longitudinal analysis to further explore project team resilience from the perspective of proximity, consolidating our conclusions. Second, we measured variables at the team level from the individual views. The results contributed to an initial understanding of the relationship between nonspatial proximity and project team resilience rather than totally solid proof. Future studies should measure these team-level variables from the team insight to confirm our conclusions. Third, we only used two mediators (knowledge sharing and team cohesion) between nonspatial proximity and project team resilience, whereas there may be other important mediating variables such as collective potency and team psychological safety, which should be considered in the future. Fourth, we collected questionnaires within the scope of Chinese construction projects, lacking data support from other countries or regions and other project types. Future research should further expand the scope of data collection so that the research conclusions can be more widely understood. [67].

Data Availability

The data supporting the results of this paper are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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Supplementary Materials

The supplementary Appendix displays the details of the measures of cognitive proximity, value proximity, social proximity, knowledge sharing, team cohesion, and team resilience in project teams. (*Supplementary Materials*)

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