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Theoretical Framework for Informal Groups of Construction Workers: A Grounded Theory Study

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Abstract: The current construction industry, which has a high accident rate and declining labor productivity, urgently requires efficient and practical management policies. Research has shown that social norms within informal groups have considerable influence on construction workers, while studies on informal groups of construction workers (IGCWs) have been scarce. Current theories of informal groups have not been analyzed in combination with construction industry characteristics. The purpose of this paper is to develop a theoretical framework of IGCWs, including definitions, types, characteristics, causes, and functions. First, on the basis of existing theoretical research of informal groups, two semistructured interviews were designed to collect data from managers and workers. Then, a qualitative approach using grounded theory with NVivo software was employed to code the interview information, and 25 subcategories were obtained: 5 types, 10 characteristics, 4 causes, and 6 functions of IGCWs. Eventually, a conceptual model was established to explain the definition of IGCWs according to the interview data and subcategories identified. This study not only contributes to improving behavioral science theory, especially group behavior theory and human relations theory, but also contributes to constructing an informal group theory of the construction industry. In practical terms, the targeted identification of IGCWs is useful for managers in taking measures to more effectively manage construction workers.

Keywords: construction workers; informal groups; theoretical framework; grounded theory; semistructured interview

1. Introduction

The construction industry (a labor-intensive industry) has consistently been a pillar in China [1]. Statistics have shown that the GDP of the construction industry reached $824.8 billion in 2017, accounting for 6.73% of the total. Furthermore, the number of construction workers has remained at around 60 million in recent years in China [2]. Similarly, the construction industry employs approximately 7% of the workforce globally [3]. However, this industry has shown low per capita output value, declining labor productivity, and a high safety accident rate [2,4,5]. To improve the current situation, efficient management measures are urgently demanded.

The success of project management requires joint efforts and close cooperation of organization members [6]. It is believed that the organizational perspective is an effective management tool. Since the Hawthorne experiment proposed the existence of informal groups in 1931, the theoretical community has generally recognized that organizations can be divided into formal and informal groups [7], which play indispensable and distinctive roles in enterprises [8–10]. Formal groups are

established to consciously accomplish organizational tasks [11], while informal groups spontaneously form and then affect organizational performance by changing workers' behavior, job satisfaction, and production efficiency during this process [12,13]. Therefore, both formal and informal groups should be focused on to achieve good management effects. At construction worksites, there also exist many different informal groups with their own values and goals [5]. This paper calls them informal groups of construction workers (IGCWs). For example, most construction workers come from the same hometown for work, and the relationship formed between them is a typical informal group [14]. Moreover, a gathering of workers due to common interests is also an informal group. Indeed, formal regulations cannot completely satisfy the requirement of dynamic and complicated construction site management. Workers perceive managers as "royal visitors" and feel a sense of distance from them [5]. As a result, workers are disobedient to managers in their heart sometimes and good management effects cannot be achieved, just instantaneously. Conversely, some scholars have pointed out that social norms and culture within groups have a greater influence on shaping construction workers' behavior [15]. However, the source of social impacts at construction sites originates more from informal groups, such as informal norms or rules, rather than from enterprises or organization [5,16]. Overall, social norms and group pressures within informal groups may be even more strongly present in workers' daily lives and operations [17]. This leads to informal groups exerting an enormous effect on productivity, project costs, and safety performance during construction [16,18,19]. In summary, it is necessary to concentrate on IGCWs to enhance the effective management of construction workers.

Nevertheless, few scholars have systematically explored IGCWs thus far. The current findings on informal groups have been based on research within factories, with less consideration of other industries and employee characteristics. Generally, informal groups may behave differently because of a working environment or the individual differences between workers [11]. Construction enterprises are characterized by poor working environments, geographical remoteness, and blocked traffic and information, which is dramatically different from manufacturing businesses [5,20,21]. Construction workers also have different attributes from factory employees, such as generally low education levels, low social status, a transient nature, and a lack of a sense of belonging [15,17]. Particularly, construction workers remain in semi-enclosed project sites that are less exposed to the outside world, allowing them to become more immersed in their own "small groups", called "informal groups" in management science [14]. Thus, the characteristics of the construction industry could result in the particularity of IGCWs, which deserves further discussion. Accordingly, these particularities will bring about some different and unexpected influences on the progress, safety, and cost of construction enterprises. From this point of view, what are IGCWs? It is yet unclear. This paper aims to construct a legible theoretical framework system for IGCWs. Most scholars have suggested that a theoretical framework should be discussed from all aspects, including definitions, types, characteristics, causes, and functions [8,9]. In terms of the method, grounded theory, which is a scientific and widespread theory-building method, was chosen for the present study. It is applicable to specific problems that are not clearly defined [22]. It is a typical method for collecting data in the field and building theories from local data, and it avoids overreliance on existing research [23,24]. This method is consistent with the purpose of this study: constructing a new informal group theory about construction workers.

To sum up, this study aims to fill a gap in the theoretical framework by using grounded theory to investigate the definitions, types, characteristics, causes, and functions of IGCWs. This paper considers the differences within the construction industry from the aspects of the environment, forms, scale, and staff and innovatively strengthens research using empirical data. Its significance lies in updating and enriching the limited body of knowledge on informal groups and in constructing an informal group theory in the construction industry. Practically, it contributes to helping construction enterprise managers develop measures to achieve emotional management and improve management performance. More importantly, this study lays a firm foundation and provides directional references and guidance for follow-up research on informal groups in the construction industry.

2. Literature Review

2.1. The Definition of Informal Groups

The concept of informal organization was first formally proposed in 1934 by F. J. Roethlisberger, a Mayo assistant and participant in the Hawthorne experiment, and refined in 1939. Subsequently, masses of management scientists defined informal groups from different perspectives, which are summarized in Table 1. So far, although there have been different definitions of informal groups at different points, scholars have basically reached a consensus on understanding that informal groups involve informal interpersonal interactions that exist within formal groups. However, these definitions all lack elaboration on specific organizations or industries. Therefore, it is indispensable and meaningful to investigate the definition of informal groups, focusing on the construction industry.

Table 1. Review of definitions of informal groups.

Perspective	Definition	Management Scientists	Reference
Interpersonal interaction (the nature of informal organizations)	Informal organizations are those interpersonal interactions that are not regulated by the formal system or actually make up for the lack of formal norms among the members of the organization.	F. J. Roethlisberger	[25]
	Informal groups are those alliances that are neither formally structured nor defined by the organization and are formed naturally in the workplace to meet the needs of social interaction.	S. P. Robbins	[9]
	Informal organizations are not established or demanded by formal organizations intentionally, but rather they are a network of personal and social relations that are spontaneously formed by people's contact with each other.	J. W. Newstrom	[26]
The relationship with the formal organization	Informal organizations appear in every formal organization. Their specific operation is nourished by the normality of the formal organizational system. Because they live and work together, their members form their own conventions, norms, values, and social relations.	P. M. Blau	[27]
	Informal organizations are interpersonal relationships in an organization that affect organizational decision-making, but they are either inconsistent with or ignored by the formal program.	H. A. Simon	[28]
Analysis from three aspects: activity, mutual influence, and emotion	Informal organization is a kind of "force field" that is a combination of various forces in an equilibrium state, including the environment in which the group operates as well as the personalities, feelings, and mutual opinions of its members.	K. Lewin	[10]
Informal organization: an unconscious formation process	Informal organizations are the result of unconscious social processes: the sum of human contact, interaction, and aggregation.	C. I. Barnard	[8]

2.2. Types of Informal Groups

Since informal groups do not have the same clear organizational pattern as formal groups and are difficult to identify [8,10], it is necessary to classify informal groups to manage them effectively and

understand their causes and functions. The types of informal groups vary according to how they are classified, as is shown in Table 2.

Table 2. Review of types of informal groups.

Classification Mode	Types	Explanation	Reference
Reasons for the formation of informal groups	Interest groups; friendship groups	-	[9]
	Friendship; hobby; work; self-protection; convenience groups	-	[29]
Interactions between employees and its impact on organizational goals	Opinion consultation network	Network members rely on excellent internal staff to solve problems or provide technical information.	[30]
	Trust network	Employees can share subtle political information within the organization and help each other in times of crisis.	
	Communication network	Employees talk to each other about work-related matters based on formal rules.	
The relationship between informal organizations and organizations	Cold groups	Members share certain common difficulties and thus often exhibit dissatisfaction and a very unbalanced attitude. They are indifferent to the conduct of the organization.	[31]
	Eccentric groups	The behavior of groups is inconsistent before and after: sometimes they maintain a good cooperative relationship with managers, and sometimes they suddenly break out into rebellious behaviors.	
	Strategic groups	The behavior is well planned, and most members are engaged in judgment work, which is done alone.	
	Conservative groups	Most of the members are knowledgeable, skilled, carefree, confident, and stable.	
The relationships between informal groups members	Vertical type	Members have a superior and subordinate relationship.	[32]
	Horizontal type	The social status of the members is roughly the same.	
	Casual type	Members come from all departments of the organization: they communicate closely and solve worries and difficulties with each other, meeting the needs of friendship.	
Intimacy (tightness) between members and loyalty (security) to the enterprise	Positive type	Strong intimacy and loyalty: this is the most favorable type.	[33,34]
	Interested type	Weak intimacy and strong loyalty, which exists due to being like-minded and is harmless to business.	
	Negative type	Weak intimacy and loyalty: this is a less favorable type and is obstructive for business.	
	Devastating type	Strong intimacy and weak loyalty: this is the most unfavorable type and tends to be very threatening.	

As is shown in the table above, informal groups have been classified from different perspectives. Among them, the most representative ones are the formation reasons of informal groups, relationships

with formal organizations, and the impact on organizational performance. Because these classifications basically remain at the level of macro theory, they lack local research on different organizations. For example, what are the specific hobby groups and work groups among construction workers? Given their education background and the quality of construction workers, strategic and conservative groups may be less common in the construction industry. A hobby group could be more singular than other industries due to the rough and remote environment. Moreover, considering the typical geographical and kin characteristics of Chinese construction workers [14], the main types of informal groups may differ prominently. Hence, it is very imperative and essential to study types of informal groups considering the characteristics of the construction industry and workers.

2.3. Characteristics of Informal Groups

It can be seen from the definitions that informal groups have different characteristics from formal groups. Barnard has pointed out that informal groups are characterized by uncertainty (the status and affiliation of their members are uncertain and unclear), no fixed structure, no distinct branches, universality, and frequent changes in the population density [8]. Lewin has also indicated that they have specific group norms and fuzzy boundaries in terms of their organizational structure, and they are not easy to identify [10]. Scholars have summarized other features: spontaneity, cohesion, a leader's prominent effects, good interpersonal relationships, and no clear organizational goals [11,33–35]. In particular, D. Krackhardt has analyzed four characteristics of informal groups from graph theoretical dimensions: (a) any actor can be connected to other actors; (b) power relationships pass from those who are more powerful to those who are less powerful; (c) the higher the connection efficiency, the better the organizational effect; and (d) conflicts are difficult to resolve if several pairs of actors in a network do not have a single common superior to report to regarding the conflict they face [30]. However, the above features are fragmented and broad. Some scholars have extended them to schools and have specifically investigated the characteristics of informal groups of college students [36]. At present, few scholars have analyzed the characteristics of IGCWs. Due to the particularity of construction workers, it is likely that informal groups among them have some specific or distinctive features compared to other enterprises.

2.4. Causes of Informal Groups

Through a literature review, it was found that current research on the causes of informal groups has mainly focused on four aspects, as shown in Table 3. It is believed that these conclusions are universal. Different organizations may have their own more concrete causes because of inconsistency in the environment, scale, personnel, and culture [11]. In addition, the construction industry is very typical from these aspects. Consequently, the purpose of this paper was to root out construction workers to investigate the causes of the formation of informal groups.

Table 3. Review of causes of informal groups.

Causes	Detailed Causes	Reference
Human sociality	People are social in nature and are "social persons"; psychological and emotional needs	[11,25,34]
Indivisibility and coexistence of informal and formal groups	Informal organization is the necessary precondition of generating formal organization; the normal and valid operation of formal organization is inseparable from informal organization	[8,35]
The limitation of formal organization	An organization's hierarchical structure; a rigid system; insufficient flexibility	[11,34,37]
The characteristic of stronger homogeneity among members	Shared interests or hobbies; common attitudes, beliefs, and emotions; employees' similar life backgrounds	[26,34,35,38]

2.5. Functions of Informal Groups

It has been widely recognized by the academic community that informal groups have both positive and negative effect on organizations. An initial summary is shown in Figure 1 [6,8,11–13,25,35,39–41]. On the whole, informal groups contain two positive effects: meeting the needs that group members cannot satisfy in formal organizations and maintaining the balance of an organizational system. Conversely, when informal groups are not effectively guided and managed, corporate goals will be undermined. Therefore, we should not blindly resist their negative functions to avoid the opposite effect. Instead, we should strengthen guidance and give full play to their positive effects.

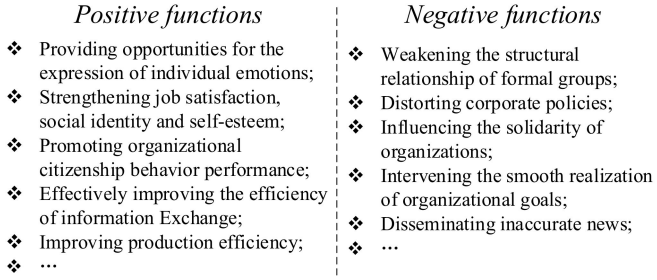

Figure 1. Review of functions of informal groups.

In the construction industry, some scholars have studied the effects of informal groups on project goals. The contents are summarized as follows: Informal organizations contribute to the transmission of tacit knowledge, which is the key skill mastered after long-term practice in a construction enterprise, thus lowering the cost of project management [18]. Informal organizational supports, especially those based on relationship conflicts, unfair rewards, and treatment, are much more effective than formal support in reducing the pressure of construction estimate participants [19]. In addition, informal communication based on social and emotional interactions enables construction workers to obtain more timely information, such as effective ethics-related information, which is often difficult to provide through formal communication [42]. Meanwhile, informal communication can reflect the team's views and ideas more authentically, release work stress, and improve organizational personal relationships [20]. Of note is that informal communication refers to information exchange based on informal groups [43]. Other scholars have pointed out that there are informal safety practices, including norms, that are critical to balancing collective and individualistic preferences. They are used by workers to regulate each other and determine permissible actions [16]. Andersen et al. have also stressed that construction workers generally do not obey safety managers; instead, subgroups exert enormous influence over values, goals, and the perception of safety issues [5]. To sum up, informal groups could affect all aspects of construction corporations. Current studies have mainly been carried out from the perspectives of project costs, safety performance, and workers' work pressure. Nevertheless, few scholars have systematically and roundly explored the impact of informal groups on the construction industry.

3. Methodology

3.1. Grounded Theory

Grounded theory, a scientific and influential qualitative research methodology, refers to conceptualizing and categorizing original data collected in the field and then extracting core concepts [44]. Grounded theory originated from sociological research and has been widely spread to management, education, and other fields [44,45]. Five core principles (theoretical sampling, theoretical coding, theoretical saturation, constant comparison, and theoretical sensitivity) should be adhered to when applying grounded theory [24]. The specific implementation process is shown in Figure 2. It can be seen that grounded theory is a bottom-up research methodology. Data collection and

analysis are interactive processes, that is, "data collection–theory formation–data collection–theory improvement" constantly cycle until theoretical saturation (no new category emerges and the integrality of concepts has been captured) is reached [22]. Of note is that theoretical sampling plays an essential role in data collection, helping in decisions about which interviewees should be interviewed next using the theory being constructed to improve theory as a whole [23]. Meanwhile, in the process of data analysis, a systematic three-stage coding process should be strictly followed to make sense of interview data [44]. By constantly comparing data and data, data and subcategories, subcategories and subcategories, and subcategories and concepts, codes can be grouped and concepts can be generated from a more theoretical and abstract level [15]. In general, research should be rooted in data, maintain theoretical sensitivity, and not be influenced by previous literature throughout the coding process [24]. Writing memos is a key intermediate step between data collection and paper draft writing. As coding progresses, memos contribute to proposing a space for future data collection, actively thinking about data, and developing abstract concepts and potential relationships between categories.

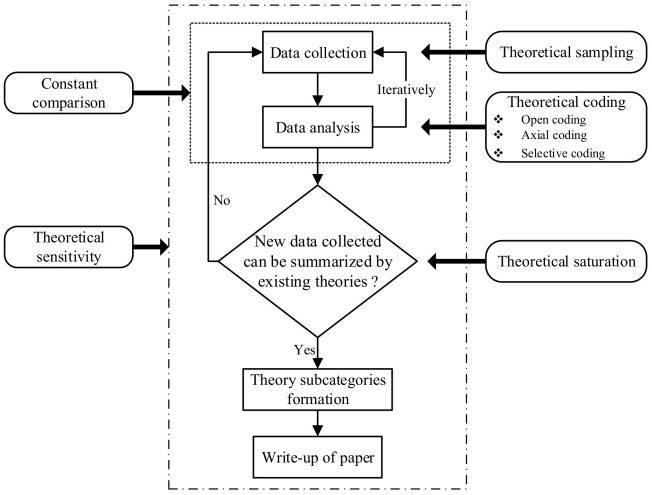

Figure 2. Implementation process.

3.2. Data Collection

Interviews are deemed as particularly appropriate for grounded theory [4]. Considering that informal groups are complicated and difficult to identify [8,10] and that the field survey found that there was a misunderstanding about informal groups among construction employees, it was not proper to design a questionnaire for a large-scale quantitative study on workers. Furthermore, this paper mainly wanted to explore the lives of workers (without involving interest relations) and avoid the inadequacy of interview methods to a certain extent, such as information concealment and inaccurate answers. Therefore, interviews were conducted to acquire data mainly for grounded theory analysis. In order to verify the reliability and validity of the interview data, they were supplemented with extra data through observations and informal conversations during each interview. Particularly, it was necessary to inform the participants that the dialogue would only be employed for academic purposes and that there was no relationship of interest with superiors before the interviews. The information obtained was completely confidential and anonymous. Ultimately, all of the interview data were audiotaped, and notes were taken with the consent of the interviewees and subsequently transcribed verbatim for data analysis.

3.2.1. Semistructured Interviews

A semistructured interview can acquire a large amount of textual and phonetic interview materials by delving deeply into the views of interviewees on the targeted problem. The reason for choosing semistructured interviews rather than structured or unstructured ones was that they provide

more flexibility: additional questions can be proposed whenever it is appropriate to ensure pivotal information that is relevant to the research topic [15,45,46]. Because of the nature of informal groups, it was not appropriate to choose newly formed construction sites as a sample. This study was hence confined to project sites more than half a year old to guarantee sufficient contact and communication between workers. Meanwhile, the sites selected covered as many types of construction as was possible, such as housing construction, railways, and bridges, and were not limited to one area. More importantly, opportunities for an in-depth survey could be obtained. To comprehensively and systematically analyze informal groups among workers, this paper collected data from two perspectives, namely workers and managers. Understanding the situation of workers from the perspective of managers contributed to further complementing and justifying the description of workers. This could reduce the subjectivity and one-sidedness of a single-object interview. Particularly, the managers chosen as survey objects had to have a sufficient understanding of and contact with construction workers. According to the above conditions, combined with the principles of grounded theory, theoretical sampling, and theoretical saturation, 5 construction sites and 30 interviewees were finally determined. Basic information about the 5 sites is shown in Table 4. The personal information and professional backgrounds of the 30 interviewees (covering 20 workers and 10 managers) are displayed in Tables 5 and 6. Interestingly, Mason found that the mean sample size is 31 (after reviewing 560 qualitative studies) [47]. Therefore, 30 samples were accepted, which is reasonable. The whole interview process lasted for three months from February to April 2019. The average duration of each interview was approximately 90 min (ranging from 80 to 100 min). In addition, all interviews were conducted in the meeting rooms of the project departments to ensure a suitable and quiet environment and were conducted one-on-one.

Table 4. Basic information about the sample sites.

Serial Number	Construction Company	Name of Construction Site	Type of Construction Project	Total Construction Workers	Total Number of Managers	Commencement Time of the Project	Province Where the Construction Site is Located	Number of Managers Interviewed	Number of Workers Interviewed
I	China Railway Construction 20th Bureau Group Third Engineering Company Limited	World City	Housing construction	Approximately 30	5	August 2018	Chongqing	1	2
II	China Construction Second Engineering Bureau Co., Ltd. Southwest Branch	Overseas Chinese Town (OCT)	Housing construction	Approximately 250	36	October 2016	Chongqing	2	3
III	No. 2 Engineering Company of China Railway No. 8 Engineering Group Co., Ltd.	New Shui Cao Railway Project	Railways, bridges	Approximately 500	Approximately 100	The first quarter of 2017	Tangshan, Hebei Province	3	5
IV	China Railway Group Limited	Meng Hua Railway	Railways, bridges, tunnels	600–700	Approximately 130	March 2015	Yuncheng, Shanxi Province	2	4
V	China Construction Third Engineering Bureau Co., Ltd.	Chengdu Global Trade Project	Housing construction	Approximately 1000	Approximately 200	2012	Chengdu, Sichuan Province	2	6

Table 5. Personal particularities of managers.

Serial Number of Managers	Gender	Age	Marital Status	Educational Background	Work Experience in the Construction industry	Position	Years of Working in the Present Position	Duration
Manager I-1	Male	38	Married	Undergraduate	10 years	Minister of project contract department	4	80 min
Manager II-1	Male	27	Single	Undergraduate	5 years	Engineering technician	5	82 min
Manager II-2	Male	26	Single	Undergraduate	4 years	Material department staff	4	93 min
Manager III-1	Male	45	Married	Undergraduate	18 years	Technical director	2	85 min
Manager III-2	Male	48	Married	Junior college	28 years	Project manager	1	98 min
Manager III-3	Male	26	Single	Undergraduate	3 years	Engineering technician	3	95 min
Manager IV-1	Female	33	Married	Undergraduate	8 years	Budget office	2	98 min
Manager IV-2	Male	47	Married	Senior high school	30 years	Director of the dispatch office	6	85 min
Manager V-1	Male	30	Married	Junior college	8 years	Engineering technician	8	84 min
Manager V-2	Male	42	Married	Senior high school	20 years	Deputy production manager	5	88 min

Table 6. Personal particularities of construction workers.

Items	Description	Num	Items	Description	No.
Gender	Male	18	Type of work	Carpenter	3
	Female	2		Plasterer	4
Age Group	Below 20	1		Welder	1
	21–30	4		Steel bender	2
	31–40	4		Scaffolder	3
	41–50	9		Waterproof worker	1
	Above 50	2		Plumber	1
Marital Status	Married	17		Painter	1
	Single	3		Backman	4
Educational Background	Did not go to school	2	Work experience in the construction industry	Below 5	2
	Primary school	5		5~10 years	4
	Junior high school	12		11~20 years	3
	Senior high school	1		21~30 years	6
Number of Children	None	4		Above 30	5
	1	2	Duration	20~30 min	1
	2	10		31~40 min	9
	3	3		41~50 min	8
	4 or more	1		51~60 min	2

Two interview guides for workers and managers were employed to collect responses and guide the interview process so that there was no deviation from the normal track. The two interview guides included the following four main categories: the characteristics, types, causes, and functions of IGCWs. A pilot experiment was conducted with a manager and a worker to ensure that the interview could collect valid and rich data for analysis. Subsequently, the guides for workers and managers were revised and refined.

3.2.2. Observations and Informal Conversations

Although a relaxed interview environment was created as much as possible, a purposeful interview will inevitably cause interviewees tension, which results in information retention and incomplete content. To ensure the completeness and effectiveness of the data, it was imperative to use the observation method to validate and amend the narrations. After every formal interview, author 1 stayed at the construction site all day to observe the working status and living habits of the workers. In addition, the interviewers utilized workers' rest times to get familiar with them and make them lower their guard, so that they could communicate with interviewers more freely and give more natural information. Then, the interviewers engaged in informal communication, taking advantage of workers' lunch breaks and afterwork hours. Through observation and informal conversation, the content of the semistructured interviews could be tested on the one hand, and more in-depth and valuable data could be obtained on the other hand.

3.3. Data Process and Analysis

The analysis followed Strauss and Corbin's coding paradigm, which involves a three-stage coding process: open coding, axial coding, and selective coding [24]. NVivo (a powerful qualitative analysis software that can help analyze various data when using qualitative research methods) was utilized as a subsidiary tool of the coding process. To guarantee the objectivity of coding, two analysts (the first and second authors of this article) coded the partial interview data independently in the beginning,

and then a face-to-face discussion between the two analysts was employed to challenge and critique each other's ideas to seek consensus. Only when the two coders agreed on a mutual coding process could they continue coding the transcripts.

As is shown in Figure 3, the process of open coding is the first step in data analysis (labeling and conceptualizing). The labeling process directly labels the original text data, which expresses research content without any induction or reorganization. The conceptualization process mainly combines tagged words and phrases, assembles tags that have similar meanings, and renames them [23]. At this stage, not all of the tags are completely disrupted, but only those that can be closely integrated (e.g., "many workers come from the same village or a town" can be conceptualized as "fellow villager"). Axial coding aims to form more precise and clear subcategories by linking relatively independent concepts; as a result, four categories were eventually identified. We regarded the axial coding technique as a method of investigating the relationships between concepts rather than as restrictive rules, avoiding the concern that interpretations were formed from a mechanical application of techniques [22]. The final type of coding, selective coding, systematically dealt with the relationships between the four categories, extracting the definition of IGCWs.

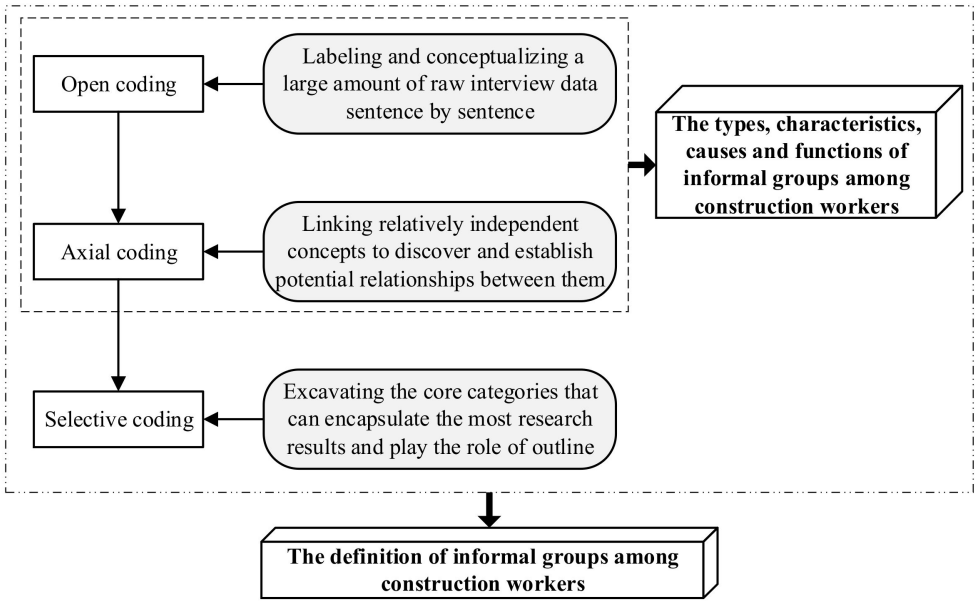

Figure 3. Theoretical coding paradigm.

4. Results

4.1. Types of IGCWs

As is shown in Figure 4, five subcategories of types were initially identified, and the number decreased. Generally, kin groups and geopolitical groups were formed when workers came to a site, while hobby groups, friendship groups, and interest groups were formed after that. As Barnard has indicated, informal organizations are formed in two ways: spontaneously before formal organizations come into being or spontaneously after that based on normal operations [8]. A detailed analysis of the five subcategories is presented in the following paragraphs.

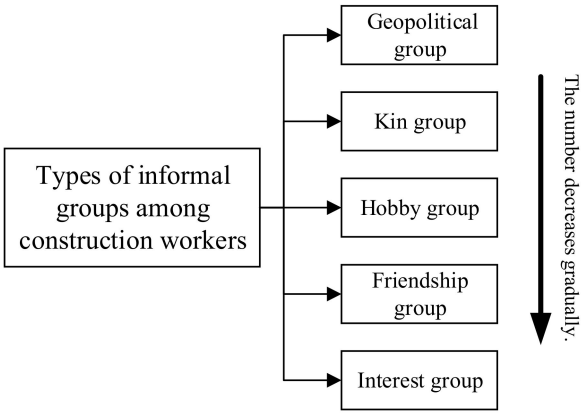

Figure 4. Five types.

4.1.1. Geopolitical Groups

There is no doubt that geopolitical informal groups were the most common among Chinese construction workers. Almost all of the interviewees expressed that workers came out to work at the construction sites together with other villagers. As Worker I-1 revealed, there were many of his fellow villagers at the construction site, either from a village or a town. In addition, the majority of workers stated that their boss was from their home region: they came to the site with the boss. Manager II-1 responded that there exists such a phenomenon in the Chinese construction industry. Namely, first, the workers go to the construction site with a boss from the same town. Then, if the construction site still lacks workers, the boss will ask the workers to introduce him/her to people they know. Most of these people are from their hometown. In short, geography is the premise and root of the formation of groups of construction workers. The expansion of construction workers groups and the formation of other types of informal groups are all based on geographical groups. Geo-features are a synonym for Chinese construction workers.

4.1.2. Kin Groups

It was also very common for construction workers to have their own relatives at the site. One reason, revealed by Worker III-4, was that when men come to construction sites to work, their wives follow because they cannot grow crops by themselves. Manager V-1 pointed out that it is quite widespread for a husband and wife to work together in bricklaying and plastering. This is less common in other types of work due to restrictions in the nature of the work. As was demonstrated by Manager IV-1, most jobs on construction sites are not suitable for women workers. Nevertheless, Manager III-2 also indicated that as long as the workers are willing to bring their wives, they will try to arrange work. As a result, husband–wife relationships abound at the sites. In addition, a son following his father to a construction site to learn some technical skills is now the main way to absorb the new generation of labor force in the construction industry. Manager V-1 responded that there had been a shortage of workers in recent years, with few workers onsite post-1990s. Worker II-2 also stated that young people prefer to go to factories rather than to construction sites because they think it is too hard. In other words, as long as there are relatives in the family who engage in the construction industry, wherever there is work to be done, relatives are called in whenever possible. For example, Worker IV-4 emphasized that he had come to the construction site with his three brothers. In other words, various close and distant family relationships exist at the sites, such as couples, brothers, and cousins.

4.1.3. Hobby Groups

Because of the limitations of their working environment, workers have few activities in their spare time. Worker III-2 expressed that he goes to work at 07:00, gets off work at 18:00, and has to get up at 6:00 in the morning every day. In addition, Worker V-2 said, "I work about 10 hours a day, and if the

schedule is tight, I may work overtime in the evening." The response of managers also confirmed this point. Worse, there are few recreational facilities built on the site, and workers cannot relax when they are free, as Worker IV-3 indicated. Thus, the group activities that appear the most at construction sites are eating and drinking and playing mahjong (a game of chance for four players that originated from China) or cards. Particularly, manager V-2 manifested that when it was time to leave work, several workers who liked drinking would meet for dinner. Worker I-1 also stated that eating and drinking were the conditions that brought the workers together the most because they are quite tired after a day's work and do not have much energy to do other activities, as was expressed by Worker IV-1. A mahjong or cards group is another informal group that exists among construction workers. They either play poker in the bedroom or play mahjong in the mahjong hall. However, some interviewees said the activity is rare at construction sites. Responses such as "the happiest thing every day is to fall asleep in bed", "I often play on my mobile phone during the break", and "the workload during the whole day is too heavy and very tiring" were obtained. However, some participants also demonstrated that workers who like playing mahjong or cards get together as much as possible whenever they have free time. For example, Worker IV-2 indicated that if he had a rest the next day and did not have to work, he would make an appointment with his workmates to play mahjong. Worker III-3 and Manager V-1 both emphasized that some workers will go to play mahjong when there is no water or electricity on the site or when the rain makes it impossible to work. It is worth mentioning that a fee-paying mahjong parlor was set up on the site for workers' entertainment, according to Manager V-1.

4.1.4. Friendship Groups

The majority of workers are completely willing to make friends (based on the responses of the participants). They make a few good friends with whom they can talk onsite, as was revealed by Worker II-3. Worker III-3 also suggested that friends are a must when you are away from home. As is well-known, everyone has their own personality characteristics. Similar workers thus naturally flock together to form a friendship-type informal group. An example was cited by Worker IV-4: "Workers of a comparable age usually get together and talk more." In addition, construction workers come to the sites for the simple purpose of doing their own work. There is not much suspicion and defensiveness between them, which allows them to make friends more quickly in a short time. Thus, friendship-type informal groups are widespread among construction workers, and they often gossip over teacups at the break as well as help each other in times of need. More importantly, Worker V-6 pointed out that the more friends you make, the more job opportunities you have. That is, if you have a lot of friends who work in the construction industry, they will recommend you when there is a vacancy at their construction site.

4.1.5. Interest Groups

In the Chinese construction industry, there is a kind of pervasive interest-type informal group. This is commonly known as "small subcontracting". Manager I-1 indicated that "small subcontracting" means that several workers organize together to complete a certain amount of work designated by Party A. Accordingly, there is an organizer in this small group who assembles members to complete the subcontracting task and hand over to Party A. After the workers complete the task together, Party A will pay money to the organizer, and then the workers will divide up the money together. Worker V-2 presented that these members are basically composed of relatives, friends, or fellow villagers, which greatly reduces the conflicts of interest. An example was raised by Manager II-1: "When Party A has a tight demand for time and a relatively high price, an interest informal group can be formed quickly, such as putting up canopy." Another example, cited by Worker III-5, was that they often organize masons to contract the building of a wall, and then the boss calculates the amount for them. Other types of work, such as supporting formwork, binding steel, and plastering, all exist within "small subcontracting". In addition, there is also a sort of interest group on the site occasionally. Several workers will immediately form a group to cause trouble in the project department if they are not paid

on time or for other reasons, namely "claiming back salaries". Manager III-2 illustrated that sometimes extreme measures are taken, such as blocking doors or roads and pulling banners. At this time, a key point was raised by Manager II-1, "Sharing a bitter hatred for the enemy is perfectly reflected among workers." There are basically no other interest groups among the workers, given the responses of almost all interviewees.

4.2. Characteristics of IGCWs

According to the interview data, 10 characteristics were encoded based on grounded theory, and the support strength of the characteristics was calculated, as shown in the Figure 5. We evaluated supportive strength as follows: strong support, where more than 75% of interviewees responded; moderate support, where 50–75% of interviewees agreed; and poor support, where less than 50% of interviewees agreed [48].

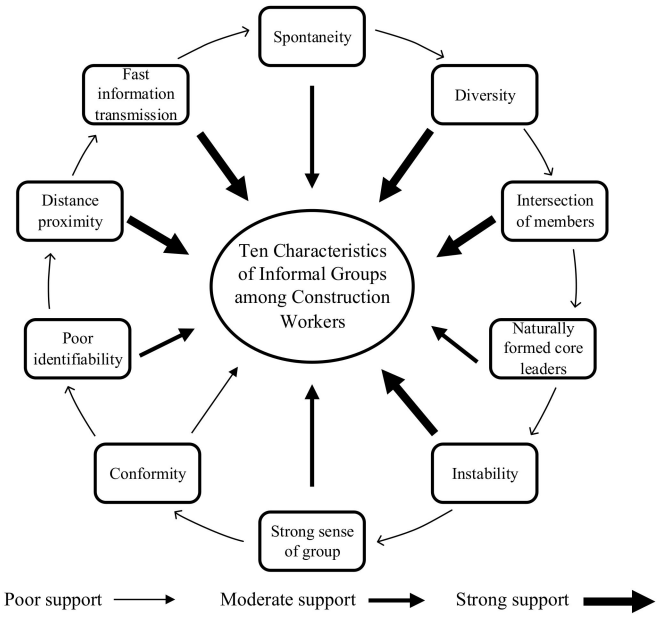

Figure 5. Ten characteristics.

First, like employee groups in most industries, IGCWs are characterized by spontaneity and diversity. Construction workers spontaneously form informal groups without the approval of the organization and a clearly defined formal structure. Moreover, there are various informal groups, as is described in Section 4.1. Second, members of informal groups intersect, that is, a worker may join several types of informal groups. Among construction workers, the intersection between interest informal groups and the other four groups was particularly obvious. In other words, geography, kinship, hobby, and friendship are the premise and foundation of the formation of interest groups. Seven other features are detailed in the following paragraphs.

4.2.1. Naturally Formed Core Leaders

Managers and workers who participated in the interview alike said there are always "petty leaders" in the informal groups where workers are located. The members of informal groups are very convinced by them and listen to them. In particular, as was revealed by Manager II-1, there are several informal leaders when a crew of workers is large, while the "petty leaders" and the foreman are usually the same person when there are fewer workers. It is worth mentioning that there are many reasons why some workers can become informal leaders. One of the most immediate reasons indicated by the majority of workers was, "He brought me to work on this construction site, so I must listen to him." In other words, the respondents reported that the worker who introduces them to the job

often becomes the informal leader he believes in. As Manager III-2 expressed, the "petty leaders" who workers trust can bring them benefits and help, at the very least. Moreover, responses such as the following were mentioned: "the chief attribute of petty leaders is their ability to find work and look for workers"; "petty leaders usually know a lot of bosses, have resources, and the boss trusts them"; "it is necessary to have affinity and be considerate to informal leaders"; "being infectious, being very talkative, and team management ability are extra points"; and "they have long working hours and rich experience and are known as veterans, and these are reasons why someone can be a 'petty leader'". This implied that different types of "petty leaders" can be created for different reasons at construction sites. For someone to become an informal leader, he must have a lot of traits. Accordingly, Manager I-1 added that some informal leaders with the above features will gradually become a formal foreman after a period of time: at the beginning, he is convinced by the workers because of some virtues or idiosyncrasies, and gradually he takes a group of workers to pick up the work, thus becoming the leader of the construction crew. Worker V-4 confirmed that standpoint. He emphasized that people who were charismatic and had construction workers under them in the 1980s and 1990s are now basically bosses.

4.2.2. Instability

The instability of informal groups is particularly evident in the construction industry. Unlike factories, construction projects are temporary, and members of informal groups are bound to change after a project is completed. Moreover, construction workers are highly mobile, and workers in different jobs are rotated as the project progresses. This results in members of informal groups being in constant flux. Worker V-1 demonstrated that new workers can quickly integrate into a collective and form their own friendships, hobby groups, etc. There is so much uncertainty on the job site that any adjustment in work may result in a reorganization of informal group members. It could be seen that the particularity of the workers' work further highlights the characteristics of informal groups with a loose structure and no obvious organizational structure. It should be emphasized that interest groups among construction workers are especially unsteady, and they form and dissolve instantly. "When the wall we contracted was finished, our group disbanded automatically," was pointed out by Worker III-5. "We will disband when the project department solves our problems," was illustrated by Worker V-3. Furthermore, conflicts of interest or contradictions between members can also lead to some changes in the members of informal groups. One typical and widespread example cited by Worker V-5 was unequal or unreasonable distributions of wages. Almost all the interviewees agreed with this situation.

4.2.3. A Strong Sense of Group

Members have a strong sense of group regardless of the types of informal groups described in Section 4.1. Most participants indicated that members are willing to help each other when needed whether at work or in life. Worker III-4 emphasized that whoever can do the work will do it. Next, cooking, washing dishes, and sweeping the floor are chores that help in daily life. When members of informal groups encounter problems, other members will be very anxious and will try to find solutions together. One example given by Manager V-2 was that, "As soon as one of the workers suffers a minor injury at work, the group members all stop working, either going to the hospital or to the boss." Another example was that some workers cannot count, so in a wage settlement, his relatives, friends, or fellows will help to calculate if the amount is right, something illustrated by Manager I-1. Worker IV-2 also raised the point that as long as there are problems at the construction site, the relatives and friends who come together are anxious. Worker IV-3 added that, "We are a collective, so I am responsible for all of the members." When members are punished or their interests are violated, they tend to cling together to help speak and find reasons to fight for their peers. Manager II-1 said that if the problem is slightly serious, they will organize to make trouble within the company. To sum up, the group consciousness of the five types of groups is distinctly stronger compared to official teams.

4.2.4. Conformity

In the context of Chinese culture, conformity has always been especially serious in the minds of Chinese people. The low cultural quality of construction workers leads to a more obvious herd mentality. Manager III-1 sighed, saying that construction workers have a severe copycat attitude, and many people do not have their own ideas. They see what acquaintances do and how they do it. Responses such as, "When confronted with disagreement, we usually adopt the solution of minority subordination to the majority (internally)" were expressed by the workers interviewed. Manager V-2 also indicated that workers usually keep in line with their workmates in terms of instructions or orders from their superiors. Whether they comply depends on whether most people do it or not. Interestingly, some of the workers do not want to do certain tasks, but they do them if they see other coworkers do them, as Manager IV-1 demonstrated. In conclusion, construction workers have a strong sense of the code of brotherhood: many of them are "uncouth fellows", so there is a rendering power in informal groups that cannot be underestimated.

4.2.5. Poor Identifiability

Predictably, IGCWs are hard to identify. The main reasons are as follows. First, they involve the social and emotional needs of workers, while managers do not consciously pay attention to the emotional facets of workers. One response was given as follows by Worker IV-1: "The leaders don't understand which workmates we usually get together with: they just focus on us doing a good job." Secondly, current construction workers are basically labor subcontractors. The workers belong to the labor company where they work. This means the managers of project departments have less direct control over the workers. As was revealed by Manager II-1, when they encounter problems or have instructions to convey to workers, they will first find the person in charge of the labor company or the job foreman. Manager I-1 also stated that he has more contact with the owners of labor companies and safety officers and less contact with workers. More importantly, construction sites are large and workers are constantly on the move, making it difficult for managers to keep track of workers. In brief, the vague boundaries of informal groups cause them to have unrecognizable features.

4.2.6. Distance Proximity

According to the interview data, forming IGCWs is characterized by distance proximity. The formation of informal groups is influenced by geographic distance and the length of contact time. Labor is usually subcontracted to several construction teams. Accordingly, the work is divided into different sections, and workers brought by each foreman work and live together. There is basically no intersection between each contractor team, especially between those who build roads and tunnels. For example, Manager III-3 indicated that the New Shui Cao Railway (constructed by his company) reaches a length of 40 km. Manager III-1 also indicated that the members of informal groups are almost like a construction team, and they have more contact with each other. Therefore, there are all kinds of informal groups within every construction team. Manager II-2 reported that informal groups are often found in a dormitory because workers are close. Meanwhile, some participants emphasized that workers in the same occupation are more likely to form informal groups because they work in the same area. This enables them to work at the same pace, which creates an advantage in terms of conditions for the emergence of informal groups. However, it was noted that proximity has a greater impact on the formation of the latter three types of informal groups and a smaller impact on the former two types.

4.2.7. Fast Information Transmission

Undoubtedly, informal communication spreads faster than formal communication in most cases. Whether this is work-related information or what has happened to a workmate, information can quickly propagate among members of informal groups. Moreover, informal communication has more avenues than formal communication does, such as face-to-face communication and making a phone

call. Worker II-1 also suggested that he has a "WeChat group" with other workers. An example illustrated by Manager III-1 was that when a worker injured his finger while working, he immediately called his relatives. This response implied that the first thing that comes to mind when a construction worker encounters trouble is his family members, relatives, friends, or fellow townsmen rather than his supervisors. The closer the relationship is, the more he considers it first. Furthermore, numerous interviewees indicated that if an informal group is formed at the site and does not work in one place afterwards, they will still introduce work to one another. The existence of informal groups not only promotes the dissemination of information onsite, but also has a time delay, which is probably one of the reasons why workers are happy to make friends.

4.3. Causes of IGCWs

The root cause of informal groups is due to the sociality of human beings, and the construction industry is no exception. People are generally gregarious, with less emphasis on individuality. Individuals tend to join certain informal groups to obtain a psychological sense of belonging and security. As an old Chinese saying goes, birds of a feather flock together. Worker III-4 said, "I need to make good workmates to eliminate loneliness." Manager III-2 also expressed that only a handful of introverted and unspoken workers play alone, and most of them come and go together in a small group. Given the characteristics of the construction industry, four subcategories of causes of informal groups were extracted through the axial coding of grounded theory. Table 7 lists the four main reasons and some informants' narrations. These subcategories are illustrated in detail below.

Cause 1: According to Maslow's hierarchy of needs, human needs are multilayered and multifaceted. Enterprises can only meet the needs of workers at the second level, that is, job security. The psychological needs and emotional needs of workers at the third level are often difficult to satisfy, and they include hobbies, friendships, and private conversations. Since workers are highly mobile and there exists a "traveler mentality", they do not feel like they belong in their companies. Consequently, they can only form their own informal groups to meet their emotional needs.

Cause 2: As everyone knows, the construction industry has been known for its tough conditions and heavy workload. Workers will go wherever the construction site is, leaving them adrift far from home. When going to a strange place, a person will inevitably be afraid of being deceived and bullied. Therefore, workers will go to construction sites as much as possible with their relatives, friends, and fellow villagers. In addition, on the one hand, the work of the construction industry is complicated and has many variable factors. It is desirable that workers can have their own small groups to coordinate with each other and solve problems together. On the other hand, the work is so intense every day that workers need to relax after work, chatting and drinking with good workmates and complaining about the hard work of the day. In short, if workers have their own informal groups, they can commute to work together and help each other when needed so as to avoid loneliness when working outside.

Cause 3: In China, the construction industry absorbs a large amount of the labor force due to the low threshold for jobs and various types of work. These workers come from different parts of the country, whether they have been engaged in the construction industry before or not, and regardless of age, they can find corresponding jobs. For instance, there will be skilled old masters on the site, such as masonry plasterers, carpenters, and welders, and there will be newcomers who can do nothing. Hence, there is an obvious clubbing phenomenon, i.e., workers with similar backgrounds and common topics will naturally form informal groups: some exchange work, some go out drinking, and some play cards together.

Cause 4: At a construction site, the workers' scope of activities is small and there are few outside temptations and choices. What they face most is work and workmates. Although workers are mobile and do not stay long at a construction site, living and eating together create opportunities for them to fully understand each other. These objective conditions prompt them to get acquainted with chatty workers and form informal groups with them.

Table 7. Four main causes.

Causes	Examples of Informants' Responses	Informants
Due to the temporary employment of construction workers, there is a general "traveler mentality" among them, and they cannot be satisfied in the organization except for the needs of work.	People are emotional animals with emotional needs.	Manager III-3
	Labor companies can only offer jobs for us.	Worker I-1
	When workers encounter feelings of being lovelorn, depressed, or angry, they need someone to express these feelings to and communicate with.	Manager IV-2
	Construction workers are highly mobile and unstable, with little sense of belonging and identity within enterprises.	Manager V-2
They tend to form informal groups to help each other or complain about work due to the remote geographical locations and harsh working environment of construction.	Construction has strict time limits and complicated work surfaces, so it is inevitable to need help.	Manager III-2
	If something needs to be done, I will think of my friends, fellow villagers, or relatives.	Worker III-1
	When I am tired of working, I chat and complain with my good workmates.	Worker V-1
	When working outside of what is familiar, I will try to be with a group of people.	Worker IV-4
The low threshold for construction jobs makes the quality of workers uneven. Workers with similar living backgrounds or experiences naturally gather together.	Age parity is a primary reason for us to get together as an informal group.	Worker II-2
	I will naturally become friends with coworkers with similar backgrounds and a common language.	Worker IV-3
	Workers sometimes cluster according to skill level: the skilled and meticulous work together, and the newcomers work together.	Manager II-2
A large number of workers live and eat together, and the proximity of time and space allows for more opportunities for contact and interaction.	Although roommates do not know each other beforehand, we can become good friends after a period of understanding.	Worker V-5
	Workers go to and from work with their roommates every day.	Manager I-1

4.4. Functions of IGCWs

In line with the grounded theory method, the interview information was analyzed repeatedly. Ultimately, three levels of incidence that included six positive effects and the corresponding negative effects on companies or workers were identified from high to low. In general, IGCWs have a great positive effect on both enterprises and workers themselves. However, in some cases, these positive effects can spill over into negative ones. The encoded results are shown in Figure 6. All subcategories in the diagram are described as follows. In addition, the functions of "petty leaders" within informal groups of workers are also expounded upon.

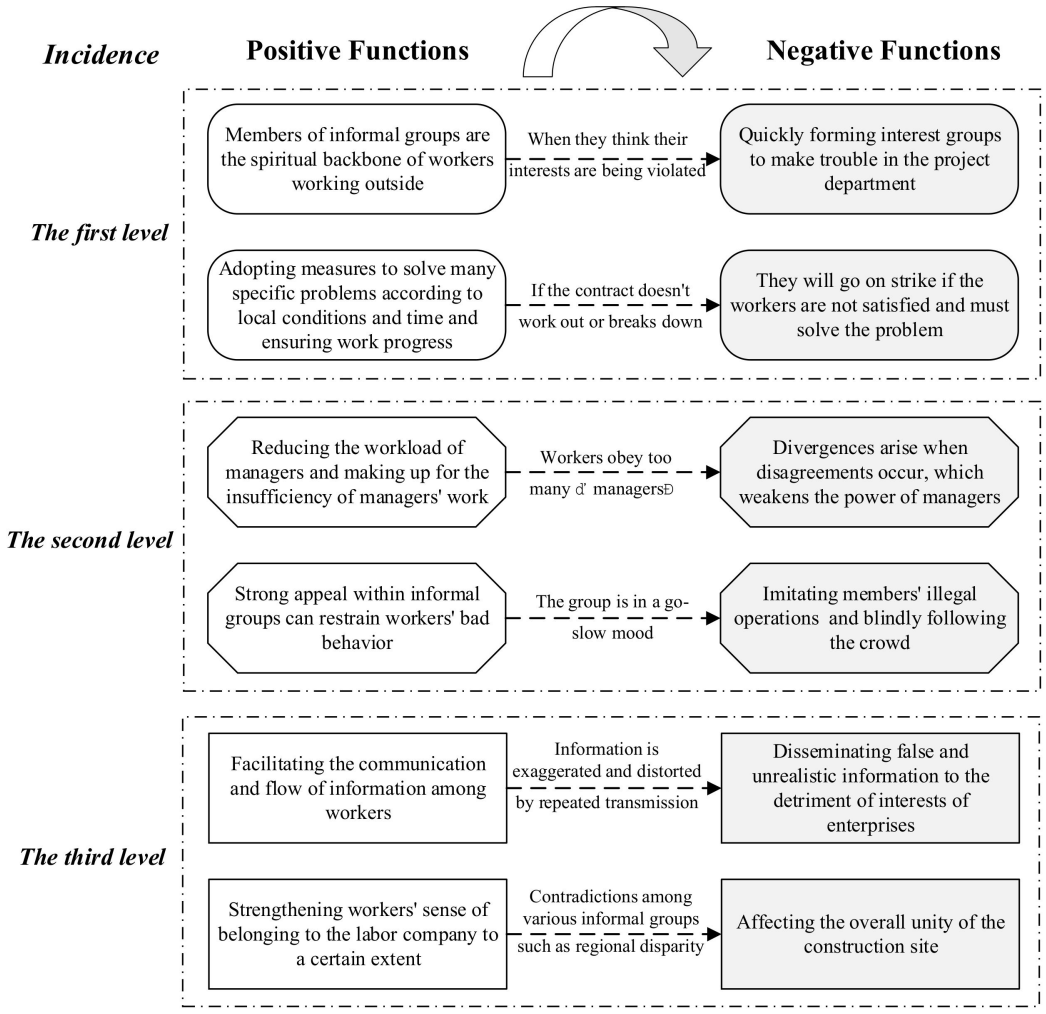

Figure 6. Positive and negative functions.

The first level: In this high-risk industry, most workers are far from their homes and relatives, which causes certain mental stress. Informal groups provide a channel for workers to release their feelings, such as irritability and depression. In these groups, workers are given a certain status and identity, which meets the social needs of workers and becomes the spiritual pillar of workers working outside. For example, all of the interviewees responded that forming informal groups with coworkers can make them feel dependent. When they encounter difficulties in work or in life and feel upset, the first people they think about are the members in their informal groups, as was stated by the majority of the interviewees. Manager I-1 also reported that chatting with members of informal groups is a major way for workers to relieve stress, relax, and reduce loneliness. Unfortunately, it is the presence of these informal groups onsite that allows workers to quickly form an interest group that can cause trouble. However, this only happens when workers' interests are infringed upon, such as when wages are not paid on time.

In addition, since there are many variables in the construction industry, the existence of informal groups can solve plenty of the specific problems that are encountered onsite. First, workers and their relatives, friends, and fellow townsmen come to the construction sites in groups, which can quickly meet the needs of project construction. Manager III-1 and Worker IV-3, for example, cited that "informal groups are good for project completion and can help in obtaining workers". Next, informal groups have high execution, high efficiency, and fast progress due to their strong cohesion. Almost all of the managers indicated that these two points are the greatest benefits of informal groups. Third, when sites need to meet an urgent task, the informal group formed can rapidly organize to solve the problem and

save the construction period. The informal groups based on interests were introduced in Section 4.1.5. This is a win–win situation for workers and project departments. Nevertheless, it is precisely because they exist as a group that when they are not satisfied, they will strike en masse. This has a huge impact on the progress of projects and is a potential hidden danger for enterprises, as was mentioned by Manager V-2.

The second level: The presence of workers in informal groups reduces the burden on managers. Manager IV-1 emphasized that scattered workers are difficult to manage, which increases the difficulty of virtual management. Meanwhile, informal groups can make up for managers' lack of work. An obvious example revealed by the participants was that "when working with well-connected coworkers, their moods are pleasant, the working atmosphere is harmonious, and working efficiency will improve accordingly". Manager II-2 supplemented that it is excellent for enterprises to form informal groups because there is not much contradiction within them and problems can be solved internally. Worker I-1 also added that "when my work style is different from that of other workers, members will advise me on how to be efficient". Moreover, this does not have a negative impact on the implementation of the project. However, this may weaken the power of managers to some extent. In other words, workers listen more to the "petty leaders" of their informal groups than to managers when opinions diverge.

In addition, informal groups have a strong appeal to their members. Workers comply with the opinions of members of informal groups and tend to act consistently with them as much as possible. A simple example was cited by Manager III-3: "Some workers do not like to wear safety helmets, but if members advise him to wear one, he will choose to wear one." Another example was cited by Manager III-1: "Some workers do not operate according to standards in order to be quick or because they have formed bad habits. Good workmates persuade them to follow normal operations, and the workers will try to correct their bad habits." Unfortunately, some bad habits, such as ignoring quality problems of engineering or wasting materials for the sake of ease, are also easy to imitate, and one person's negative emotions can easily affect other members, thus reducing the work enthusiasm of the whole group. Hence, the role of informal groups in restraining members' behavior is a double-edged sword.

The third level: As was stated in Section 4.2.7, the existence of informal groups absolutely promotes the dissemination of information within enterprises. For instance, the vast majority of workers said they would discuss their work problems with close colleagues in private. However, it is exactly because of the extensiveness and permeability of informal communication that some information will be distorted in the process of dissemination, which will eventually damage the interests of enterprises. Manager V-2 illustrated a practical example: if workers heard that the design of Party A had been changed and that they had no work to do, they would immediately contact other relatives and friends and go to another construction site. This would seriously affect the construction schedule. Other managers also pointed out that sometimes misinformation can cause quality defects.

In addition, the mobility of workers makes them have little sense of belonging to the enterprise, but the presence of informal groups on the site can alleviate this situation to some extent. Some workers stated that it is precisely the presence of these informal groups that makes him feel like he belongs here slightly. Informal groups have strong cohesion because of effective internal communication and emotional cultivation. Unfortunately, this is not conducive to solidarity between informal groups. In severe cases, this may lead to the evil practice of cliques and gangs. Manager III-1, for instance, cited that at their construction sites, workers from Chongqing, Sichuan Province, looked down upon local workers, thinking they were poor at their job.

To sum up, informal groups will influence the construction period, cost, quality, and safety of projects (especially safety and the construction period) through influencing workers from many aspects, such as construction behavior, construction efficiency, and information dissemination channels. Therefore, managers should consciously consider the role of informal groups to facilitate organizational goals.

The functions of "petty leaders" in terms of workers: As was described in Section 4.2.1, there are naturally formed core leaders in informal groups, and we call them "petty leaders". Through coding, we found that "petty leaders" can influence workers in many ways. The concrete impacts and the informants' narrations are displayed in Table 8.

Table 8. Functions of "petty leaders".

Functions	Examples of Informants' Responses	Informants
Lending an ear to members' ineffable concerns and helping them solve their personal problems	When there are too many leaders and too many inspections, and members cannot stand it, they will try to comfort other members.	Manager I-1
	When I lose my temper, he will persuade me and hold me back.	Worker V-2
	He will help members deal with their relationships with workmates, teams, and project departments and will help them to speak.	Manager III-3
Correcting inappropriate words and behavior of members	When members do something wrong, they will give members private counseling. For example, smoking is forbidden in some places of the construction site.	Manager IV-1
	If I say something I should not say or do not follow the rules and regulations of the company, they will correct me.	Worker II-2
Helping members solve the problems encountered in their work	Many of our workers will coordinate and help solve problems in their work.	Worker III-3
	When some of the villagers or relatives and friends have just come to the construction site, many things they do not understand are taught by "petty leaders", such as staircase trig functions.	Manager I-1
Improving workers' centripetal force and sense of belonging to the organization	Because he is here, I am more comfortable working at this site.	Worker IV-2
	Some of the workers had been working with these "petty leaders "for a decade or two, and they felt they belonged to the organization.	Manager III-2

4.5. Definition of IGCWs

Through selective coding, all of the subcategories were reexamined and combined to establish a conceptual model of IGCWs based on the connections between them (Figure 7). The grounded theory model suggests that the formation of informal groups has two time nodes. Workers first follow their relatives or fellow townsmen to the construction site. Kin groups and geopolitical groups are formed at this point, and then workers can meet fellow workers who share common hobbies and get along with them after a period of contact. In the process, if there is a conflict of interest or there are new tasks to be done, workers immediately build an interest group on the basis of the first four categories of informal groups. There are several concrete reasons why workers form informal groups. Moreover, these informal groups all embody certain characteristics, as is shown in Figure 7. Because informal groups have these characteristics, they have an irreplaceable impact on enterprises and workmates.

In conclusion, "IGCWs" refers to groups spontaneously organized by workers who go to work on construction sites for their livelihoods based on blood relationships or geographical relationships, and it also refers to groups that are naturally formed through common hobbies and interests and the harmonious coexistence of workers interacting with each other on site. These groups are not approved by the organization, nor do they have a fixed organizational structure, but they use emotions as a link. Natural leaders also exist that have an essential influence on the operation of formal organizations.

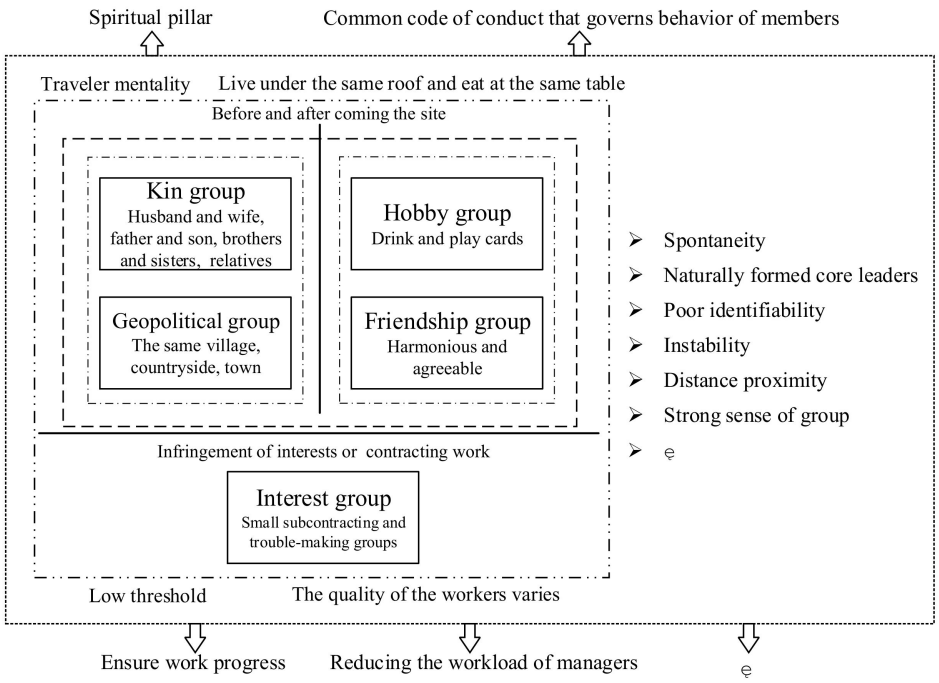

Figure 7. Conceptual model.

5. Discussion

5.1. Theoretical and Literature Support for the Results

Through the grounded theory coding method, this paper systematically investigated the existence of IGCWs. Some of the identified codes were supported by previous studies, e.g., the characteristics of instability and spontaneity [8,10,35]; the types of interest, hobby, and friendship groups [9,29]; the causes of emotional needs and the limitations of formal organizations [11,34,37]; and the functions of improving the efficiency of information exchange and easing work pressure [6,8,40]. Moreover, the issue of many formal groups having evolved from informal groups was also discussed by Barnard [8]. As was partially pointed out by the respondents, at first, the workers follow the foreman or fellows from their own villages to work on various construction sites or are introduced to the sites. Gradually, the team grows into formal teams and is registered within labor companies. In addition, this paper reached a consistent conclusion about the idea that leaders who develop spontaneously within informal groups can solve many problems that cannot be solved within organizations [34]. The geographical and kinship characteristics of construction workers, which have been mentioned by some scholars who have researched the construction industry, were also verified in the data analysis of this paper [14]. In addition, some roles for informal groups in the construction industry that have been analyzed by other researchers (directly or indirectly) were also supported, such as reducing work pressure [19,20], restraining workers' safety behavior [5,16], affecting workers' cognition [5], threatening the interests of formal organizations [20], and spreading gossip [42].

5.2. The Particularity of IGCWs Compared to Other Industries

In addition to the above research conclusions, it could also be found that IGCWs have their particularities. This paper constructed an overall theoretical framework for IGCWs. These identified subcategories are much more specific and targeted than those of the existing research, which has discussed the theory of universality only. In terms of types, hobby groups are more singular: there are only drinking groups and mahjong groups due to geographical constraints. The form of interest groups is more definite (basically only two groups): "small subcontracting" and "claiming back salaries". Geopolitical as well as kin groups are especially prominent and account for the vast majority of IGCWs,

which is the biggest distinction from other enterprises. Some informal groups that have been discussed in previous research, such as strategic and conservative groups [31], are almost nonexistent among construction workers.

In terms of characteristics, there is a big difference in the reasons for the formation of informal leaders. In the construction industry, the most important attribute of being an informal leader is the ability to find jobs and workers instead of management and other skills. Instability, conformity, and poor identifiability are also more obvious in contrast to factories. Moreover, IGCWs are characterized by distances proximity that working at the same pace, and eating and living together create favorable conditions for informal groups to emerge. This feature of informal groups is more dominant in the construction industry. Since most construction workers are far from their hometowns, their inner emptiness and insecurity make them have a sense of community that is stronger than that of employees of other businesses.

In terms of causes, the high mobility of construction workers means that they obtain fewer demands within organizations. This further encourages construction workers to form informal groups to meet their unmet needs. Remote geographical environments and a short supply of entertainment facilities make workers more in need of emotional sustenance. The coworkers around them become practically their only channel to express their emotions. In addition, the low threshold for jobs in construction also differs from factory enterprises. There are a variety of workers with different backgrounds and experiences, and those with similar backgrounds spontaneously come together.

In terms of functions, this article presents a clear framework for IGCWs and divides the degrees of influence of functions into three levels that are integrated with the actual work situation of construction workers. Previous studies have not graded the strengths and weaknesses of functions according to workers' characteristics. Furthermore, with the corresponding positive and negative effects of informal groups, the double-edged-sword characteristics of informal groups are more clearly displayed. A detailed analysis of each function provides a more concrete understanding of the role of informal groups within construction organizations. In particular, the function of solving the many specific problems encountered at construction sites is quite remarkable. For example, informal group relations can be used to quickly recruit employees for the enterprises. On the contrary, the negative effects of riots in project departments are also more typical than in other enterprises. High mobility makes workers less awed by construction businesses.

In terms of definitions, the formation of IGCWs is mainly based on geography and kinship, and workers form various informal groups. Moreover, there are two obvious time nodes that urge construction workers to form informal groups, which are determined by the nature of the construction industry. The two times nodes are before and after site arrival and when there are infringements upon rights or subcontracting. This is different from the formation mode of informal groups in most other enterprises. Informal groups are gradually formed through contacts and communication after workers are hired by companies. Therefore, it is essential to take into account the characteristics of the industry and the employees when studying informal groups, especially in some industries.

Some noteworthy issues that were found during the interviews will be discussed in this section. Above all, there is a phenomenon in the construction industry where workers get to know their workmates at a site, forming a closer informal group if they work together at a new site. Simultaneously, the exclusiveness of informal groups among construction workers is significantly weak compared to most other enterprises. Workers are willing to make friends on the job site because the construction industry requires them to have their own professional circle to introduce jobs to each other.

Interestingly, when they were asked if the workers are afraid to communicate with the administrators, the managers' and the workers' responses were divided. For one thing, the workers said that they feel distant from the managers in their hearts, and they are afraid to communicate with the managers' heart-to-heart and become friends. The managers responded that workers do not fear communicating with the management: they are only unwilling to do so. However, if they encounter problems, they contact them directly. Manager II-1 stated that workers' wages are three

times as high as theirs, and workers have no inferiority complex. Manager III-3 revealed that if technicians say something wrong, the workers will point it out directly with no fear. Manager III-2 also provided insight, saying that before 2000, workers had the mentality that they were afraid to share with managers, but now they find the project department to solve their problems immediately. Therefore, fear or unwillingness to communicate with managers is not the reason why workers form informal groups.

There is also a general perception in the Chinese construction industry that mentorship groups are very common. Nevertheless, according to this interview, such informal groups have gradually dwindled, sometimes to zero. Worker V-3 and Manager IV-2 said that there were more teachers and apprentices before the 1960s and 1970s, but now there are fewer. Nowadays, young people come to construction sites to learn construction and management, and they hardly learn craftsmanship. Worker I-2 indicated that those with high technical skills, such as masons, plasterers, and carpenters, are basically old masters. Manager V-1 stressed that the time limitations of construction sites are quite tight, so they call skilled workers directly. He does not see masters coming with their apprentices. Worker II-3 also reported that despite mentoring relationships, the apprentices are unlikely to work at the same construction sites. Furthermore, groups of classmates and comrades-in-arms relationships are also less common on site. Worker V-6 expressed that the workers have low levels of education, so they do not have many classmates. Worker IV-4 supplemented that although classmates or comrades-in-arms engage in the construction industry, there are few opportunities to encounter them at a construction site. Consequently, informal groups of social relations, such as classmates, teachers, and apprentices, rarely exist. In addition, another kind of aspirational and faith-based informal group is invisible among construction workers, according to the participants. Manager III-1 illustrated that construction workers have been immobilized and have no ambition, as they just want to earn money to go home. All of the interviewees expressed that few workers believe in religion. Despite workers sharing a collective religious belief, they do not come together to form informal groups, hiding it in their hearts.

5.3. Management Insights

With improvements in people's living standards, the problems inherent in regarding construction workers as "economic people" and the limitations of using money to manage workers have become gradually exposed. Through the above analysis, it was found that informal groups are particularly significant in the construction industry. Nowadays, construction workers have social needs as well as material needs. Although the turnover rate of construction workers is very high and the composition of informal groups can change rapidly, new informal groups are constantly generated, which affects the behavior of workers and the organizational goals of enterprises with a circulation of workers. It is precisely because of the rapid turnover of construction workers that they lack a sense of belonging and identity within the enterprise, and the management effect is often poor (from an organizational level). Consequently, contractors should make use of the role of informal groups (with emotions as the link) to improve the management efficiency of workers.

The significance of this article lies in the following: On the one hand, on the basis of existing behavioral science theories and industry characteristics, this paper constructed an informal group theory of construction organizations. This further enriches and refines the existing theoretical research, such as Mayo's human relations theory, Barnard's social systems theory, and Simon's decision theory, and it opens up a new perspective for further research on behavioral science theories and modern organizational theories. On the other hand, if contractors understand the characteristics and functions of IGCWs and their informal leadership, they can implement management more pertinently so as to promote their advantages and avoid their disadvantages. In other words, managers can carry out targeted education for various types of informal groups and be good at utilizing their characteristics to help achieve organizational goals. Specific measures can be taken from the following aspects: First, contractors or people in charge of labor companies may consciously arrange for relatives, friends, and fellow townsmen with good relationships to work and live together, which reduces conflicts of

interest (such as wage allocation). It is also more conducive to teamwork, improving construction efficiency. Second, the strong sense of group consciousness and the binding force of informal groups can be employed by supervisors to regulate the inappropriate behavior of workers. Third, it is a good idea to disseminate safety knowledge among informal groups and to raise workers' safety awareness through other members. Furthermore, because of their strong mobility and low levels of education, workers lack an inner obedience to managers, and informal leaders tend to have more influence over them. Contractors can thus utilize the influence of informal leadership to persuade workers, making them useful helpers. Ultimately, recreational activities such as drinking and playing mahjong can easily lead to insufficient rest and a lack of concentration at work, which may lead to unsafe behaviors and low production efficiency. Managers can pay special attention to and educate these groups. Targeted education often works better than mass education. In summary, this study establishes a solid foundation for pursuing related studies and is universal and extendable to the construction industries of other developing countries (besides China).

6. Conclusion and Future Research Directions

This paper has provided management insight into IGCWs. Through open coding and axial coding within grounded theory, a total of 25 subcategories were preliminarily collected, where 5 were coded as types, 10 as characteristics, 4 as causes, and 6 as functions. Respectively, five categories of informal groups—geography, kinship, hobby, friendship, and interest—were extracted. These features included 10 items, such as naturally formed core leaders, instability, a strong sense of group, conformity, and poor identifiability. The causes could be summarized from the following four aspects: workers are not satisfied in the organization except for the need to work, and they have a "traveler mentality"; they need to help each other or complain about work due to the remote geographical locations and harsh working environments; the low threshold for jobs in the construction industry makes workers with similar living backgrounds naturally gather together; and workers living and eating together create more opportunities for contact and interaction. Six major positive functions were analyzed, namely emotional support, solving specific problems in different situations, making up for the defects of a manager's work, stopping workers from behaving inappropriately, facilitating the flow of information within the enterprise, and enhancing workers' sense of belonging to the enterprise. At the same time, six negative effects were also discussed. Moreover, four functions of "petty leaders" on workers were identified. Lastly, a conceptual model based on qualitative data and the above-mentioned subcategories was developed to explain the definition of IGCWs through selective coding. Along with the interviewees' narrations, this paper made a detailed and overall analysis of these five categories, highlighting the differences and specificity of informal groups that are formed among construction workers.

This paper made an initial and cutting-edge exploration of IGCWs through interviews with a small sample, which provides a reference for future research. Nevertheless, more studies need to be carried out based on this paper. First, different research methods and a larger data sample can be used to verify and enrich the conclusions of this paper. Second, the degree of influence of different types of informal groups on the realization of various objectives of the project can be further studied, such as quality, construction period, cost, and safety. More significantly, the respective influence mechanisms of the functions of informal groups identified in this paper are also valuable research points.

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