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Network Characteristics and Organizational Structure of Chinese Drug Trafficking Groups

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Abstract Unlike previous studies of drug trafficking groups that focused on the characteristics of individual members, this study examined the demographic and socioeconomic composition of drug trafficking groups and the types of relationships binding criminal networks. Through an analysis of 144 drug trafficking groups adjudicated in the intermediate and high courts in several provinces of China, this study found a high level of homogeneity in demographic characteristics and socioeconomic status among the offenders who formed the Chinese drug trafficking networks. Results also showed that most Chinese drug trafficking groups were small and lacked a vertical role structure. The concentration of men was associated with a higher likelihood of having a hierarchical role structure in the trafficking group.

Keywords Drug trafficking · Organized crime · Co-offending · Crime network · China

In explanation of offending patterns in drug trafficking, social scientists traditionally focus on individual characteristics, including demographic, psychological, and socioeconomic characteristics of the traffickers (Decker and Chapman 2008; Paoli and Reuter 2008; Vale and Kennedy 2004). Through years of research, researchers have accumulated significant knowledge of individual characteristics of drug traffickers. For example, studies have shown that drug traffickers were mostly male, poor, ill-educated, and occupationally unstable. These demographic and socioeconomic characteristics greatly influence the likelihood of individual involvement in drug trafficking. In comparison, researchers have paid much less attention to the network characteristics of drug trafficking groups. With the exception of a handful of studies examining criminal networks and co-offending patterns (Malm et al. 2010; McGloin 2005; McGloin et al. 2008; Sarnecki 1990, 2001), criminologists have not paid much attention to the types of relationships binding drug dealing groups. It is not well known to what extent members of a drug trafficking group share the same demographic and socioeconomic characteristics and

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how the composition of the group influences the structure and operation of the drug trafficking networks. This study is intended as an effort toward narrowing this gap in drug trafficking research. The objectives of this study are twofold. First, it identifies the characteristics of a sample of 144 Chinese drug trafficking groups in terms of size, demographic and socioeconomic composition, and role structure. Second, it examines how demographic and socioeconomic composition is related to the organizational structure of these groups.

To our knowledge, this project is the first large-scale study of drug trafficking networks in China. Since China emerged as a major illicit drug trafficking market in the world, much attention has been directed to the activities of drug dealing networks. Yet, there has been few empirical studies examining the extent to which individuals involved in drug trafficking activities in China are organized (Zhang and Chin 2008). Drawing on evidence collected from several Chinese courts, this study seeks to advance the knowledge of the network characteristics and organizational structure of Chinese drug trafficking groups.

Prior Research on Drug Trafficking Networks

Organizational Structure of Drug Trafficking Networks

Group offending is a distinctive feature of drug trafficking. Because illegal drug dealing often requires multilevel operation involving producers, wholesalers, retailers, and runners, it is quite common to find drug traffickers working with two or more other offenders to distribute illegal drugs and share profits. Most research on drug trafficking groups has focused on the organizational structure of these groups. The majority of the studies conducted in this area have identified the lack of formal structure as a salient feature of modern-day drug dealing groups (Bright et al. 2012; Dorn and South 1990). Haller (1992) described the local networks formed in drug trafficking as "Rotary Club model," suggesting that these groups were not hierarchically structured. Further, they did not form long-term partnerships and did not coordinate their respective activities collectively. Through in-depth interviews with drug smugglers, Decker and Chapman (2008) found that present-day drug trafficking generally lacked the strict and vertical organization that characterized earlier drug dealing groups. Instead, drug trafficking networks were mostly made of loosely tied cells or nodes consisting of players who were not connected or who had little knowledge of others. Benson and Decker (2010) examined the common features of formal organizations and contrasted them with characteristics of drug smuggling organizations recounted by a sample of high-level international drug smugglers. In comparison with formal organizations, they found that drug smugglers typically worked in horizontal, informal, and loosely connected groups. Orders or commands in these groups seldom came from a centralized authority communicated down organizational structure. Rather, informal associations that relied on personal knowledge, kinship ties, or common experiences characterized how most decisions were made in these groups.

Lack of formal organizational structure seems to be a common feature for both large drug trafficking networks and small dealing groups. Several studies differentiated among various types of drug dealing networks. In a study of drug supply networks in the UK, Ruggiero and Khan (2006) identified four types of drug dealing networks. The first type was *family network*, consisting of largely family members who worked together in drug trade. The second type was *mono-ethnic network* in which all members shared the same ethnic identity. The third one was *issue-specific network*, which had a more identifiable organizational structure but lacked long-

term membership. The last one was *value-adding network* that conducted business with any reliable actor that could generate added value to the network. Across all these four types, the different actors involved in illicit drug dealing "do not share motivations, values or lifestyles, thereby inhabiting an economy based on fragmented roles and cultures rather than a homogenous social setting" (Ruggiero and Khan 2006, p. 481). Natarajan (2006) distinguished between *street level* and *upper and middle level* drug trafficking groups. Street level trade referred to retail dealing where drugs were packaged and sold to individual users. Upper and middle level dealings referred to earlier stages of the drug distribution process in which illicit drugs were transported from producers to individual retailers. Despite the differences in size and level of involvement, Natarajan found that as a whole, drug trafficking organizations did not fit the traditional organized crime model. These organizations could be best described as loosely structured networks of groups and cliques, with little or no hierarchy. The view is consistent with recent research findings that drug trafficking is a highly fragmented business, consisting of separate entrepreneurial groups engaged in exploiting the profit-making opportunities presented by the demand of drugs (Pearson and Hobbs 2001; Reuter 2004).

Not all researchers agree that drug dealing networks are predominantly small and loosely organized. Malm and Bichler (2011) contended that past research suggesting that illicit drug markets were comprised of small groups of networked entrepreneurs was too simplistic. Their own study found significant variation at each niche within the drug market. Natarajan and Belanger (1998) also found a higher level of diversity among drug trafficking organizations than what had been suggested in the literature. The drug trafficking organizations they studied ranged from small, loosely structured "freelance" group to large, hierarchical "corporate" organizations (p. 1019). Natarajan's more recent study, however, showed that even very large drug dealing groups seemed to be made of loosely connected independent entrepreneurs, who sometimes collaborated but also competed with each other (Natarajan 2006).

Demographic and Socioeconomic Composition

There has been considerable evidence showing a high level of homogeneity in age, sex, race, and socioeconomic status among non-drug co-offenders, especially juvenile offenders (Malm et al. 2011; Reiss and Farrington 1991; Weerman 2003). Surprisingly, information about demographic and socioeconomic composition of drug trafficking groups has been sparse. A few studies provided descriptive statistics of individual dealers involved in drug trafficking networks. These studies, however, generally took a traditional statistical approach focusing on the *point estimates* (e.g., the mean) of the characteristics of a sample or a population. Few of them examined group-level attributes, for example, the extent to which members of a drug trafficking group shared the same demographic or socioeconomic characteristics.

Using point estimates, prior research indicated that drug offenders are typically older offenders (Bouchard et al. 2009). Sampson and Laub (2003), for example, reported that the mean age of onset for drug offenses was 25, compared to 13 for property offenses in the Glueck men cohort. Studies also found that the age of members of drug dealing networks varied by type of groups in which they were involved. Dealers in the local, street level trafficking networks tended to be younger. The home office in the UK indicated that South Asian drug offenders were between ages of 16 and 35 (Ruggiero and Khan 2006). This range was close to the drug offenders interviewed in a study conducted by Vannostrand and Tewksbury (1999), whose ages ranged from 19 to 48. The average age of the 578 incarcerated

Chinese drug traffickers interviewed by Chin and Zhang was 35.5. Benson and Decker (2010) found that the age of high-level international smugglers was older. The age of the 34 drug smugglers they interviewed ranged from 19 to 79 with modal age standing between 40 and 49 years old.

Previous studies also found that it was common for a large proportion of drug trafficking group members to have the same ethnic identity (Pearson and Hobbs 2001; Ruggiero and Khan 2006). This was especially true at the local level. One of the motivations for a drug dealer to join a trafficking group was to hang around with people of the same family or ethnic origin (Ruggiero and Khan 2006). In some cases, ethnic affiliation increased the opportunities to participate in certain sectors of the drug market dominated by particular ethnic groups (Felson and Clarke 1998; Paoli and Reuter 2008). This trend, however, is changing in recent years. New market conditions have emerged and have increasingly encouraged alliances among dealers with different ethnic background (National Crime Intelligence Service 2003). Partnerships among different ethnic groups are viable alternatives to traditional mono-ethnic organizations as they provide access to a variety of producers and to multi-commodity illicit markets (Heal 2002). Partnerships are inevitable at upper supply level. Just like some aspects of legitimate economies, big dealers and large-scale trafficking operators are not discriminatory on the basis of their partner's or customer's background. Driven by profit-making motives, dealers at upper and middle levels increasingly go outside their areas of residence, doing business with all kinds of people, regardless of their ethnic background (Ruggiero and Khan 2006). All of these studies point to an increasing level of diversity in terms of ethnical identity among drug trafficking groups.

A few studies also provided a description of the socioeconomic characteristics of drug traffickers. In general, these studies found that street level drug dealers were mostly poor people who turned to drug dealing to make money when legitimate employment was not available or inadequate to meet cost of living (Chin and Zhang 2007; Ruggiero and Khan 2006). Dealers working in the upper and middle level networks are more diverse in their socioeconomic standings. Some worked as retailers and runners with limited and unstable income (Natarajan 2006). Others are sellers and brokers who have sizable income and possess effective infrastructures, including cars, mobile phones, and financial resources. It is not uncommon for middle and upper level dealers to set up legitimate businesses after accumulating finances through drug trafficking and other illegal activities (Ruggiero and Khan 2006).

Drug Trafficking Networks in China

Empirical studies of Chinese drug trafficking networks have been sparse. One of the earliest studies was conducted by Dobinson (1993), who found that most of the heroin trafficking activities in the then-British territory of Hong Kong were carried out by individuals who developed drug dealing networks through personal connections. Dobinson contended that the perception of well-organized trafficking operations conducted by the criminal underworld was a myth. The finding was corroborated by a case study of drug trafficking groups in southern China performed by Tang and Zhao (2006), who also found that drug traffickers were loosely connected individuals who built drug dealing networks through family ties and personal relationships.

To date, the largest empirical study of Chinese drug trafficking activities was a field study conducted by Chin and Zhang (2007). The study focused on drug trafficking activities in the

cross-border region between Myanmar and China. Through observations and interviews with law enforcement officers, informants, drug traffickers, and drug users, Chin and Zhang found that the majority of those who participated in the business of smuggling and distribution of illegal drugs in the border region were poorly educated, lacked employable skills, and had few alternatives to make a living comparable to their aspirations. The vast majority of the incarcerated drug trafficking offenders in their sample were residents of the rural areas from some of the poorest provinces in China, including Yunnan, Guizhou, Xinjiang, and Ningxia. Few of those offenders completed more than a middle school education. Only about half of them were employed at the time of their arrest. Those offenders typically worked as mules whose main duty was to carry drugs for dealers. The traffickers in their sample generally did not belong to street gangs, organized crime groups, or terrorist organizations. Most of them were simply risk-takers who worked with family members, or formed alliances with friends or other social contacts that they came to trust. The networks they formed usually started with just a couple of people who were either relatives or acquaintances based on neighborhood or village ties. In the absence of a blood relationship, informal social networking often played a critical role in communication and illicit business operation. This type of organization was more adaptable to changing market conditions and law enforcement activities. According to the law enforcement officials and drug traffickers the authors interviewed, the trafficking business in China became increasingly dichotomized, with the mules on one end having little knowledge of whom they were working for and the organizers on the other end who coordinated trafficking operations from behind the scene. Those organizers were themselves entrepreneurs who were typically in charge of a small-scale operation with either family members or close friends. Most of the trafficking groups were small and were unaware of others in the region. As Chin and Zhang (2007, p. 44) observed, "Monopoly does not exist in the drug trade inside China. It is unlikely that any trafficking group will ever get to grow to any large size because the Chinese government will crack down immediately."

The Chinese drug trafficking groups studied by Chin and Zhang shared many of the same characteristics of drug trafficking networks in other parts of the world, that is, they were mostly small, loosely structured, and unstable. While cross-regional and cross-ethnic cooperation has increased in the last few years, drug trafficking networks to a large extent still relied on personal ties such as family members, relatives, friends, and fellow villagers. It should be noted that Chin and Zhang's study had some limitations. First, the study focused on the cross-border region between China and Myanmar. The drug trafficking activities it observed might be unique to that region. Second, the study mostly relied on convenient samples, which further limited its generalizability. In a comprehensive review of published research on Chinese organized crime and drug trafficking since 1990, Zhang and Chin (2008) lamented that few empirical studies were available to make definitive conclusions about the extent to which drug traffickers were organized in China. They called for more empirical research to improve our understanding of Chinese drug trafficking networks.

Current Study

While the studies reviewed in the previous section were informative, the analyses that relied on the traditional approach of point estimation did not provide a full picture of the demographic and socioeconomic composition of drug trafficking groups and the influence of the composition on the organizational structure of these groups. Specifically, the following questions still remain:

First, what is the typical demographic makeup of drug trafficking groups in terms of age, gender, ethnicity, and place of residence? Second, to what extent do members of the trafficking group share the same socioeconomic characteristics such as education and occupation? Third, how is demographic and socioeconomic composition of the drug trafficking networks related to the organizational structure of these groups? In this study, we try to provide some answers to these questions through the analysis of a sample of Chinese drug trafficking groups.

Unlike previous studies treating the individual trafficker as the unit of analysis, this study uses the trafficking group as the unit of analysis. It assesses the extent to which the offenders in a drug trafficking group share the same demographic and socioeconomic characteristics. The proportion of the actors in a group having matching characteristics can be a key indicator of the nature and complexity of the social organization. Social networks, such as a drug trafficking group, differ in basic demographic and socioeconomic features. Individual actors may have many or few matching characteristics. The number and kinds of matching characteristics among the actors can be the basis for possible differentiation and stratification (Hanneman and Riddle 2005; Malm and Bichler 2011; Morselli et al. 2007). In this study, we examine how group members' sharing of demographic and socioeconomic characteristics is related to the role structure of the drug trafficking group.

The analysis of this study is informed by two well-known theories of group offending. One is the social exchange theory of co-offending (Weerman 2003), which sees co-offending as an event in which material and immaterial goods are exchanged. According to this theory, the primary motivation of co-offending is to obtain rewards through the exchange of goods that cannot be obtained by solo-offending. In general, people agree to exchange goods when they expect it to be profitable (Hochstetler 2001; McGloin and Nguyen 2012). The same logic applies to co-offending. Weerman classified the exchange goods of co-offending into six categories: services, pay, "catch" (share in the money or goods from the offense), appreciation, acceptance, and information. He listed three necessary conditions for co-offending: First, an offender is willing to co-offend on the perception that co-offending is profitable; second, one or more potential co-offenders are available or easy to contact; and third, the co-offender is willing, driven by the perception that the offender has something to offer to make offending with him or her "profitable enough" (Weerman 2003, p. 407).

The social exchange theory is particularly applicable to Chinese drug trafficking networks because of the nature of the co-offending. As Chin and Zhang (2007) illustrated, the primary motivation of drug trafficking is to make money. The offenders involved in drug trafficking in China were mostly lower class individuals with unstable occupation and income. They saw drug trafficking as a way of making easy and quick money. At the same time, drug trafficking is a high-risk business in China. The Chinese government has taken arguably the toughest measures against illicit drug trade. If caught, traffickers would face death penalty or long prison sentences. Despite these threats, poor farmers, unemployed workers, and many other people dissatisfied with their economic conditions were willing to risk their lives for the possibilities of making quick profit. However, many of these people were either novices or had limited skills and connections in drug trafficking. They need one or more co-offenders to form a functional group for the illegal trade. The more experienced drug traffickers, on the other hand, needed people to work with them as "mules" to carry drugs from one place to another. They were consistently on the lookout for potential offenders who could fill the role. They were willing to work with the less experienced offenders as long as the co-offending could

bring in profits that they expected. It has been suggested in past research that it was this type of dynamic social exchange that underlay the formation of Chinese drug trafficking groups and defined their network characteristics (Chin and Zhang 2007; Tang and Zhao 2006).

Another theory highly relevant to the explanation of drug trafficking networks is the limited-rationality theory (LRT) (Cornish and Clarke 1986; McCarthy et al. 1998). The LRT also contends that people make a rational choice to commit crime, but their decisions to offend or co-offend are compromised by time, abilities, and availabilities of relevant information. Like most criminal activities, drug trafficking generally does not require sophisticated information-handling skills and advanced planning (Gottfredson and Hirschi 1990). The notion that drug trafficking is a form of an organized crime has not been supported by recent research, which showed that drug trafficking networks were generally small, unstable, and loosely organized. Traffickers chose to work in a group because co-offending was an effective way to make quick money and to evade law enforcement. Few of these offenders had a clear understanding of the drug trafficking market and the risks it provided. Their involvement in drug trafficking was largely driven by situational factors in their lives, including the urgent need for cash, easy opportunity, and persuasion of friends and relatives. Because of their limited knowledge of drug trade and lack of access to the broader illicit market, Chinese drug traffickers tended to work with people they had already known or those they could establish a contact with relative ease. It is our belief that the personal background of these traffickers, their specific life circumstances, and the limitations of their knowledge, skills, and social relations played the most important roles shaping the organizational structure of the drug trafficking networks in China.

Drawing on the theories of social exchange and limited rationality, we view co-offending in drug trafficking in China as an event in which two or more offenders work together to achieve monetary gains through smuggling, transportation, or sale of illicit drugs. The primary motivation of participating in the drug trafficking network is to make money. Because of the level of division of labor required in drug trafficking, it is difficult for any trafficker to act alone. To achieve the financial rewards more quickly and effectively, potential traffickers often find it necessary to work together to move drugs from the producers to the drug users. Most of these traffickers are lower class individuals from impoverished regions (Chin and Zhang 2007; Deng 2001). Their lack of knowledge, skills, and social capital makes it more likely for them to rely on social exchanges with their family, friends, and neighbors to build drug trafficking co-offending groups. To the extent that Chinese drug traffickers draw most of their resources from intimate others and acquaintances, we expect a high level of homogeneity in terms of demographic characteristics and socioeconomic status in these groups. Based on previous research findings, we also expect that most of the Chinese drug trafficking groups to be small and short-lived and that few of them have a hierarchical organizational structure characterized by the existence of a clear chain-of-command structure. We suspect that at least some of the demographic and socioeconomic characteristics on the group level contributes to the low prevalence of hierarchical structure. It has been documented in organizational research that demographic composition influences leadership behaviors in conventional organizations (Dobbins and Platz 1986; Eagly and Johannesen-Schmidt 2001). We may find a similar relationship between group-level demographic characteristics and leadership structure among Chinese drug trafficking networks.

Method

Data

This study is part of a large project examining drug trafficking networks in the greater China area. The project team collected data from the sentencing files in Chinese high and intermediate courts with jurisdiction over drug trafficking cases. These courts are located in Yunnan, Guangdong, Guangxi, Fujian, Hong Kong, Macao, and Taiwan—major provinces or territories on the "Chinese route" of drug trafficking from the Golden Triangle to Hong Kong and Macau. Data were collected from a total of 853 drug trafficking cases, which represented all of the cases adjudicated in 2006 and 2007 in these courts.

Since the focus of this study is drug trafficking groups in China, we selected only cases with three or more offenders that were adjudicated in the intermediate and high courts in the four provinces of mainland China. A total of 144 cases met our selection criteria and were included in the analysis. The 144 drug trafficking groups comprised a total of 673 individual traffickers with at least some information on the demographic and socioeconomic characteristics we examined. The number of traffickers in these groups ranged from 3 to 14 with 4 as its median size.

Data on drug trafficking networks are difficult to obtain. This is especially true in China where official crime data are closely protected by the government. To our knowledge, the data used in this study are the largest and most comprehensive drug trafficking data ever collected in China. The sentencing records, however, have some major limitations that should be taken into consideration when interpreting them. First, the case files excluded trafficking groups with one or more members sentenced to the death penalty by the Supreme People's Court of China. According to Article 235 of the Criminal Procedure Law in China, all death penalty decisions are exclusively subject to the approval of the Supreme People's Court in Beijing. The cases collected in the current study are those adjudicated in the high and intermediate courts in the four provinces, which have no jurisdiction over death penalty cases. Assuming that drug trafficking penalized by death is grave in nature, the most serious trafficking cases may be underrepresented in the data. The number of omitted cases due to this reason, however, would be very small since the death penalty is seldom used in trafficking cases in recent years. Second, the number of people in some of the drug trafficking groups might be smaller than the actual size of the group because of technical issues in the procedure of criminal prosecution. The information was collected from the final judgments of the courts. Some of the group members might have escaped during the course of investigation and prosecution. If rearrested, these offenders would be tried in separate cases at a later time. Thus, the size of drug trafficking groups shown in the case files may be undercounted because of the court's inability to bring some of the group members to criminal prosecution. Third, the sentencing files may not cover all drug trafficking networks in the four provinces. The courts might have to dismiss some of the charges against drug trafficking groups due to the difficulty in collecting drug dealing evidence. In the Chinese judicial practice, conviction of a crime of drug trafficking requires the proof of selling or the intention to sell drugs. Some of the drug dealers were caught with the possession of a large quantity of drugs that exceeded the amount of personal usage, but no evidence showing that the drugs were used for trafficking purposes. Such cases would be charged with illegal possession of drugs rather than drug trafficking.

Measures

Our measures of group-level attributes were based on characteristics of individual traffickers. This study included three sets of variables measuring individual characteristics: demographic measures including gender, age, ethnicity, and province of residence at arrest; socioeconomic measures including education and occupation; and criminal history measures including drug and non-drug offenses.

Gender is a dichotomous variable with 1 = male and 2 = female. *Age* is measured by 5 mutually exclusive categories: 1 = 19 and younger, 2 = 20–29, 3 = 30–39, 4 = 40–49, and 5 = 50 and older. *Ethnicity* has eight categories representing the most populous ethnic groups in China: 1 = Han, 2 = Hui, 3 = Zhuang, 4 = Man, 5 = Yi, 6 = Chaoxian (Korean), and 7 = Weiwuer (Uyghur), and 8 = Other. *Province of residence at arrest* covers all 34 provinces and provincial-level municipalities and regions in China.

Of the two measures of socioeconomic characteristics, *education* is an ordinal variable with seven levels: 1 = illiterate, 2 = elementary school, 3 = middle school, 4 = high school, 5 = technical school, 6 = undergraduate degree, and 7 = graduate degree. *Occupation* has 13 categories including physician, engineer, scientific researcher, public administrator, businessperson, teacher, medical professional, factory worker, driver, security guard, farmer, fisherman, and unemployed. In some of the analyses of socioeconomic status described below, we combined "farmer" and "unemployed" into a single "under- or unemployed" category. The basis for this reclassification is that the rural labor in the poor regions of China where the drug traffickers came from is largely underemployed due to insufficient farm work and lack of off-farm opportunities (Bowlus and Sicular 2003).

Criminal history measures included two variables. The first variable measured *prior involvement in any criminal offense* and the second variable measured *prior involvement in any drug offense*. Each group member was assigned a 1 (yes) or 0 (no) based on the official records.

We also included a measure of organizational structure. The court records have limited information on organizational structure of the drug trafficking groups. One piece of information relevant to this study is the designation of "principal offender" or "accomplice" to dealers in the trafficking groups. We used this variable to identify the number of principal offenders, if any, in each trafficking group and the relationships among the principal offender(s) and the accomplice(s). The groups with a principal offender were considered as having a hierarchical role structure. In the Chinese context of drug trafficking, there are generally two types of principal offenders. One is an organizer, who plans and organizes the trafficking activities. The other is a task leader who leads certain aspects of the operation, which is similar to the role of manger in the conventional business (Bright et al. 2012). Small trafficking groups usually have just one principal offender who is in charge of the entire operation. Large groups with more clearly defined division of labor may have more than one principal offender.

Analytic Strategy

Data analysis was conducted using SAS in conjunction with UCINET, one of the most popular computer software packages used to do social network analysis. We cannot conduct a full-scale social network analysis because the data used in this study are technically not social network data as they provide virtually no information about interactions among the individual

actor. To obtain the results needed in this study, we first created affiliation matrices linking individual traffickers to groups and attribute matrices of the variables in SAS. We then joined the affiliation matrices with attribute matrices using UCINET. Next, we used SAS to compute the proportion of group members who shared each of the demographic and socioeconomic characteristics. Lastly, we conducted a set of analysis using the group-level data to test the relationship between the proportion score of characteristic sharing and the measure of network structure.

Unlike previous studies that focused on the attributes of individual drug traffickers, our analysis examined the extent to which drug trafficking groups had members sharing the same demographic and socioeconomic characteristics. Thus, our primary unit of analysis was the drug trafficking group rather than the individual trafficker. The goal of the analysis was to identify the number of matches in the demographic and socioeconomic measures included in the study and assess how those demographic and socioeconomic ties are related to the organizational structure of the group.

The court records contained information about the relationships of the individuals within a sentenced trafficking group, but they provided no information about the relationships across the groups. These records would have undercounted drug trafficking groups had there been a significant overlapping in the membership of the groups. This did not appear to be the case. As previous research demonstrated, drug trafficking networks were typically small and were unaware of the existence of other groups (Chin and Zhang 2007; Natarajan 2006; Ruggiero and Khan 2006). Dealers came together to make quick profit. Once the transactions were over, the group tended to dissolve quickly and new groups would form to pursue new profit-making opportunities. There has been virtually no evidence showing that two drug trafficking groups shared the same members concurrently. If inter-group networking was as unlikely as reported in the previous studies, it would be reasonable to assume that the court sentencing files which concentrated on within-group characteristics did not significantly undercount the number of drug dealing groups due to lack of information about shared membership across the groups.

Findings

Individual Characteristics of Members of the Drug Trafficking Groups

Individual characteristics of the members of the 144 drug trafficking groups included in the analysis are summarized in Table 1. Over 80 % of them were male, 20–39 years old, and Han Chinese. Only about 13 % of members had more than a middle school education. About 80 % of them were either unemployed workers or farmers. The vast majority of them had no prior record in either criminal or drug offense. Overall, the statistics in Table 1 show that the vast majority of drug traffickers in the sentencing files were low-class individuals who had not been arrested for a criminal or drug offense before the current offense for which they were sentenced.

Organizational Characteristics of the Drug Trafficking Groups

Size Most of the trafficking groups are small. There were 49 groups with 3 members, 32 groups with 4 members, 22 groups with 5 members, and only 5 groups with 10 or more members. The average group size was 4.84.

Table 1 Individual characteristics of members of drug trafficking groups ($N = 673$)*

		Frequency	Percent
Gender	Male	580	86.57
	Female	90	13.43
Age	1–19	13	1.94
	20–29	255	38.06
	30–39	293	43.73
	40–49	90	13.43
	50+	19	2.84
Ethnicity	Han Chinese	587	87.74
	Other	82	12.26
Education	Illiterate	46	6.89
	Elementary school	238	35.63
	Middle school	297	44.46
	High school	72	10.78
	College	9	1.35
	Graduate degree	6	0.90
Occupation	Unemployed	299	45.58
	Farmer	230	35.06
	Other—unknown	69	10.52
	Self-employed	27	4.12
	Factor worker	19	2.90
	Other	12	1.80
Prior criminal offense	Yes	47	7.00
	No	624	93.00
Prior drug offense	Yes	15	2.24
	No	656	97.76

* Number of cases varies slightly by variable because of missing values

Demographic Characteristics, Socioeconomic Status, and Criminal History Characteristic matching was computed to measure the proportion of ties among members of trafficking groups in demographic traits, socioeconomic status, and criminal history. In this study, characteristic matching is a function of the pairwise matches between members of the drug trafficking group on a characteristic of interest. All of the relations assessed in this analysis between any two traffickers are measured dichotomously by either a presence or absence of a match. For a dichotomous relation, characteristic matching is the proportion of all possible pairwise matches that are actually present in a group. A value of 1 means perfect matches between all members of the drug trafficking group on an individual characteristic. A value of 0, on the other hand, indicates that none of the members shares the characteristic with any other member of the group. In this study, we first computed summary statistics of matching scores for the demographic and socioeconomic characteristics among the drug trafficking groups and then examined how the matching scores were related to the role structure of these groups.

Table 2 shows the minimum, maximum, and average matching scores for ethnicity, gender, occupation, province of residence, age, education, prior offense, and prior drug offense in the

Table 2 Scores of characteristic matching of the Chinese drug trafficking groups ($N = 144$)

Variable	Mean	Min.	Max.	Percentage (%) of groups with matching score of			
				<0.50	0.50–0.75	0.76–0.99	1.00
Ethnicity (Han Chinese)	0.84	0.17	1.00	18.88	8.39	0.00	72.73
Gender (male)	0.78	0.33	1.00	19.58	20.98	1.40	58.04
Occupation (under- or unemployed)	0.76	0.17	1.00	26.57	12.59	1.40	59.44
Province (residence registration in same province)	0.68	0.00	1.00	37.76	12.59	1.40	48.25
Age (same age group)	0.48	0.00	1.00	61.54	20.28	0.00	18.18
Education (same level)	0.40	0.00	1.00	74.13	14.69	0.00	11.19
Prior criminal offense	0.11	0.00	0.67	85.31	14.69	0.00	0.00
Prior drug offense	0.05	0.00	0.67	93.01	6.99	0.00	0.00

144 drug trafficking groups. The last four columns provide the percentage of the groups that have a characteristic matching score of less than 0.50, between 0.50 and 0.75, between 0.76 and 0.99, or 1.00.

On average, the variable with the highest matching score is ethnicity (0.84), followed by gender (0.78), occupation (0.76), province of residence at arrest (0.68), age (0.48), education (0.40), prior offense (0.11), and prior drug offense (0.05). In a typical drug trafficking group, at least two third of its members shared the same characteristics in ethnicity (Han Chinese), gender (male), occupation (unemployed or farmer), and province of residence (residence registration in same province). In contrast, only 48 % of the group members were in the same age group (typically in the 20–29 or 30–39 age category) and 40 % had the same level of education (typically elementary school or middle school). Only 11 and 5 % of the group members had an official record of a criminal offense and a drug offense, respectively.

The far right column of Table 2 shows percent of the trafficking groups with all of members sharing the same demographic or socioeconomic characteristic. As indicated in this column, 72.73 % of the groups had members sharing the same ethnicity, 59.44 % of the groups had members with the same occupation, 58.04 % of the groups had members sharing the same gender identity, and 48.25 % of the groups had members sharing the same province of residence at arrest. Only 18.18 and 11.19 % of the groups had all of its members in the same age group and with the same level of education, respectively. None of the groups had all of the members with an official record of a criminal offense or a drug offense.

Overall, the results in Table 2 revealed a number of salient features of the Chinese drug trafficking groups. The groups were very homogenous in terms of criminal history. Only a small minority of the groups had any offender with an official record of a criminal offense or a drug offense. None of the groups was composed of traffickers all with a prior record. The groups were also highly homogenous with regard to ethnicity, gender, and occupation. The drug trafficking groups were mostly composed of Han people, males, and unemployed workers or underemployed farmers. However, these groups were far from being mono-sex or mono-ethnic. Ethnic minorities, women, and employed urban residents also participated in drug trafficking although they were underrepresented. In terms of region of residence, most of the group members lived in the same province at time of arrest although only about a half of them had all of its members from the same province. In comparison, the drug trafficking groups were much more diverse in terms of age and

education. Only a small minority of them had all of its members sharing the same level of education and belonging to the same age group.

Organizational Structure and Demographic/Socioeconomic Characteristics

We addressed two questions in this set of analysis. First, what is the organizational structure of the drug trafficking groups in terms of role stratification based on the division between principal offenders and accomplices? Second, how does group members' sharing of demographic and socioeconomic characteristics affect the organizational structure?

The court documents identified at least one principal offender in 65 of the 144 drug trafficking groups. Of the 65 trafficking groups, 22 groups had only one principal offender, 20 groups had two principal offenders, and 23 groups had 3 or more principal offenders. We used NetDraw, a program module for visualizing social network data included in UCINET, to draw several graphs to show some of the typical role structures in these groups (see Fig. 1). The offender with a directed line pointing to another trafficker is a principal offender.

The groups with one principal offender, as illustrated in the upper left graph, all followed a similar pattern. In this type of groups, one offender held the leadership position while the others acted as his or her accomplices. The number of accomplices in these groups varied from two to multiple persons depending on the size of the group. In the event of two or more principal offenders, the power relations became more complicated. Some of the groups took the form of the organizational structure illustrated in the upper right graph, where the principal offenders were equal rather than subordinate to each other. In other groups, the power relationships between the principal offenders took the shape of one of the two role structures illustrated in the two graphs in the lower half of Fig. 1 in which one principal offender had power over the other principal offender(s). This principal offender therefore was the organizer and final decision maker.

To assess the relationship between characteristic matching in demographic and socioeconomic attributes and the role structure of the drug trafficking groups, we conducted a series of analyses to test the relationship between the characteristic matching scores and the dichotomous measure of group hierarchical role structure (i.e., the presence of at least on principal offender in the group). The only group characteristic significantly related to hierarchical role

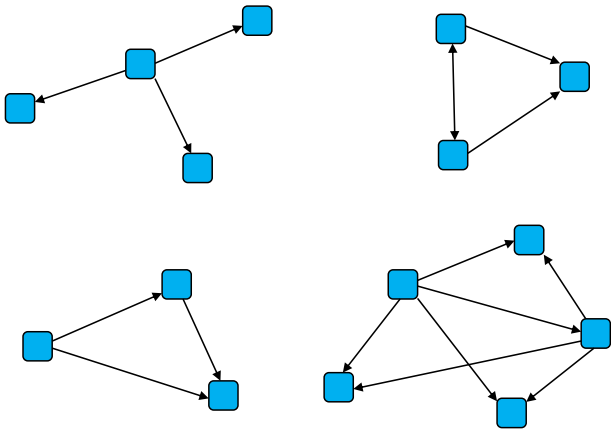

Fig. 1 Hierarchical structure of Chinese drug trafficking groups

structure is gender matching. Twenty-eight percent of the drug trafficking groups with 75 % or less of their members being males had one or more principal offenders. In contrast, 60 % of the groups with more than 75 % of their members being males had at least one principal offender. The results clearly showed that a higher gender ratio (relatively more male members) was associated with a higher likelihood of having a hierarchical role structure in the trafficking group. This finding is a bit surprising considering that women were more likely than men to be involved in domestic drug dealing and transportation of drugs, which tended to take place in groups with one or more principal offenders or managers. This gender effect, however, is not totally unexpected. Previous research has indicated that a higher gender ratio of men was positively related to initiating structure in business organizations (van Emmerik et al. 2010) and that hierarchical networks were more common among male-dominated workplace (Kankkunen 2014). Drug trafficking groups in China appeared to follow the same patterns of organizational behavior.

Discussion

Drawing on prior literature and the perspectives of social exchange and limited rationality, we have anticipated a high level of homogeneity in demographic characteristics and socioeconomic status among the Chinese drug trafficking groups. The evidence presented in this study was largely consistent with this hypothesis. Ethnically, the vast majority of the dealers involved in the trafficking groups were the majority Han Chinese. Most of the traffickers in these groups were male, under- or unemployed, poor educated, and residents of the same province. For example, all male groups made up 58 % of the network sample while 59 % of the sample consisted of exclusively unemployed workers and largely underemployed farmers. The court data also showed that few of the offenders in the trafficking groups had a prior record of criminal offense or drug offense. Taken together, these results suggested that the traffickers who formed the Chinese drug trafficking groups were predominantly poor and inexperienced offenders. They were mostly low-class individuals who worked together to seek quick profits to improve their insolvent economic conditions. Some of the offenders traveled to distant provinces to participate in drug trafficking, but most of them committed the offenses in the provinces in which they lived. Regardless of the area of residence, they might not have the knowledge and skills to offend alone. They needed support and help from other offenders to succeed in the lucrative but highly risky illegal business of drug trade. Co-offending served as a form of social exchange that provided them with not only appreciation, acceptance, information, and services but also the right and opportunity to share the profit. While these offenders had strong motivation to join a drug trafficking network, they rarely had the foresight to select the best trafficking network that would enable them to maximize their profit-making potentials. Rather, their selection of co-offenders was restricted by their limited knowledge of the illicit drug market and their relationship network. By and large, these offenders must rely on people they had already known and those they could make a connection through their relationship network. With increased opportunities provided by the rapidly developed illicit Chinese drug market, they could sometimes hook up with established trafficking networks. But most typically, these offenders formed trafficking groups with family members, relatives, friends, and fellow villagers. That was why demographic and socioeconomic homogeneity was still the norm of the Chinese drug trafficking networks. This mode of co-offender selection filled the need of modern-day drug trafficking business: small and shifty co-offending groups

that could be assembled quickly to seize the profit-making opportunities while preserving a high level of trust among the co-offenders.

While maintaining high-degree homogeneity in ethnicity, gender, occupation, and province of residence, the Chinese drug trafficking groups also demonstrated a noticeable level of diversity. These groups did not fit the profiles of the traditional mono-ethnic trafficking networks in which close-knit family members and friends from the same geographical area joined hands to form an illicit drug trafficking group. Considering that nearly 91 % of the Chinese population consists of the Han majority, it was not surprising that the drug trafficking groups were mostly composed of Han Chinese. Yet, more than a quarter of the groups had at least one minority member. In all likelihood, this level of ethnic diversity was higher than the degree of ethnic heterogeneity commonly observed in small business organizations in China. This relatively high level of ethnic diversity could probably be attributable to the need of the traffickers from other provinces to work with local people in the highly lucrative trafficking areas in southern China where ethnic minorities were overrepresented. Compared to other co-offending groups, the Chinese drug trafficking networks also maintained a relatively high level of diversity in gender, occupation, and province of residence. It is particularly noteworthy that more than half of the groups had members from different provinces. Province is an important geopolitical and cultural concept in China. Because of the geographical distance and resident restrictions imposed by local and provincial governments, farmers and other low-income individuals seldom engaged in business partnership with people from another province. The drug trafficking groups proved to be exceptions to the rules. The high level of heterogeneity in province of residence suggested that a large number of the offenders moved far away from their residential homes to participate in drug trafficking. Most of these offenders were likely residents of the northern provinces who went to the southern provinces in or near the Golden Triangle area to seek quick profits from drug trafficking. Because of their unfamiliarity with the local illicit drug market, they had to team up with local offenders to make money in the illegal business.

In consistent with previous research, the drug trafficking group was usually small. It typically consisted of only about four dealers. Judging by the absence of a recognizable principal offender in these networks, most of the trafficking groups seemed to be informal and lacked a hierarchical organizational structure.

Previous research has attributed the informal nature of the organizational structure to the needs to meet the challenging demands of drug distribution and to deal with outside pressure (Raab and Milward 2003). Decentralized, small, and shifty groups can be assembled more easily under the threat of law enforcement and can be regrouped more quickly once they are attacked. While these might be legitimate explanations, our research suggested that gender ratio in the group contributed significantly to the formation of vertical organizational structure in the Chinese drug trafficking groups. Demographically, male-dominated trafficking groups (more than 75 % of the members were male) were more likely to have a hierarchical role structure. In 58 (40 %) of the 144 trafficking groups, women made up more than 25 % of the members. This level of gender diversity appeared to contribute at least partially to the low rate of hierarchical role structure in the trafficking groups.

One should take caution when interpreting the results of the study. First, as discussed before, the court records drawn from the high and intermediate courts of the four provinces might not be fully representative of the Chinese drug trafficking groups. Second, the analysis was based on the assumption that there was no significant overlapping in the membership of the trafficking groups, which might not hold true for all groups. Third, the analysis of the

organizational structure of the drug trafficking groups is limited and may be based on somewhat unreliable information. To fully understand the organizational structure of the groups, we need to examine the functional roles of the group members and the interaction among them, including who were the decision makers, how orders were passed down, and how activities were coordinated. Unfortunately, the court data provided no information in these areas. With the available data, we were able to examine only one aspect of the organizational structure, that is, the presence or absence of a principal offender, which provided a fairly restrictive view of the structure. Further, the courts did not always have the physical evidence to establish the responsibilities of individual offenders involved in drug trafficking. Sometimes, the evidence was circumstantial or based on confessions gathered through criminal interrogation. The true masterminds might escape detection. For these reasons, we need more empirical research using data collected from China to enhance and validate the findings of the current study.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

Informed Consent Not applicable.

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