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## ABSTRACT OF THE DISSERTATION

Social Determinants of Antibiotic Prescribing in China

by

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Doctor of Philosophy in Sociology

University of California, Los Angeles, 2017

Professor John Heritage, Co-chair

Professor Tanya J. Stivers, Co-chair

Antibiotic over-prescribing and bacterial resistance is one of the biggest public health crises in the world today. Despite high prescription rates and growing resistance rates in China, our understanding of the contributors to the problem is still lacking. The existing literature has mostly concluded that antibiotic over-prescription is a supply-side problem driven by physicians' financial incentives; however, the role of demand-side factors has been largely neglected and unattended to. This dissertation is motivated by this gap.

Using a community-based and cross-sectional survey, I examined caregivers' pre-visit behavior and attitudes regarding antibiotics for children's common cold symptoms. The results showed that 38% of the respondents used non-prescribed oral antibiotics before they visited

physicians, and this behavior was not only associated with their desires for physicians' antibiotic prescriptions, but also with them receiving antibiotics during the medical visit.

To understand the process of antibiotic prescribing in medical interactions, I used Conversation Analysis to investigate physician-caregiver communication behavior in pediatric encounters. The results revealed that, first, compared to the American pediatric context, caregivers not only advocated for antibiotic treatment more overtly in Chinese context, but also did so more frequently (9% vs. 54%); second, physicians did not promote antibiotics enthusiastically – although antibiotics were prescribed 59% of the time, they were initially recommended by physicians 40% of the time; in addition, when examining the effect of caregivers' treatment advocacy on physicians' prescriptions, it was found that caregivers' overt advocacy for antibiotics increased the likelihood of physicians' prescriptions by over 9 times (OR=9.23, 95% CI: 3.30-33.08), and the effect was particularly strong on IV drip antibiotic prescriptions (OR=14.03, 95% CI: 5.77-38.70).

In conclusion, this dissertation has revealed that demand-side factors played an important role in antibiotic over-prescribing in China. Contrary to the prevailing theory that over-prescribing is a supply-side problem, I found that physicians' prescribing behavior was significantly influenced by caregiver treatment advocacy during the medical visit. Based on the findings, I recommended that first, regulations of non-prescribed antibiotics should be strictly enforced; second, health education campaigns about the rational use of antibiotics can be implemented among key population groups; and third, physicians can be given training in communication skills for resisting caregiver treatment advocacy.

The dissertation of Nan Wang is approved.

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2017





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## Chapter 1

### Introduction

#### 1.1 Introduction

Antibiotic over-prescription and associated bacterial resistance has been identified by the WHO as one of the biggest global public health crises in the world today. China's antibiotic overuse problem is particularly concerning - as the largest manufacturer and consumer of antibiotics in the world, prescription rates of antibiotics have been high, and the resistance rates of multiple strains of bacteria have been growing rapidly. With the increasing frequency of international travel and exchange, the overuse and inappropriate use of antibiotics in China is not only an alarming issue domestically, but also a global public health threat.

To explain what contributes to China's high prevalence of antibiotic over-prescription, almost all the existing research has approached the problem from a health economics perspective, concluding that antibiotic over-prescription is a supply-side problem driven by financial incentives for physicians to prescribe, as well as other underlying structural issues in the healthcare system. As a result, policy decisions direct resources toward changing only the supply-side (provider-related) factors, leaving the demand-side (patient-related) factors largely neglected and unattended.

Nonetheless, an abundance of evidence in Western literature has revealed that demand-side factors could significantly affect antibiotic over-prescription – patient desires have been recurrently cited by physicians as the most common reason for over-prescribing; perceived parental expectations for prescriptions have been found to significantly increase the likelihood of physicians' inappropriate prescriptions. Thus, over-prescribing can be a result of physicians responding to perceived pressure from the caregivers.

Despite the scale and the magnitude of the problem, to this date, understanding of antibiotic over-prescription in China is still lacking. Although supply-side factors are important contributors, they may not be the only driving force behind the problem. In fact, intervention measures that aim to reduce prescribing rates by changing supply-side incentive structures have seen limited results. In this study, I will focus on the effect of demand-side factors on antibiotic over-prescription. Findings of the study will facilitate better understanding not only of the root cause of the problem, but also of the process through which the problem is enacted at the individual level on a dynamic interactional basis.

In fact, the supply-side factors and demand-side factors are not completely independent of each other. In the next section, I describe the historical evolution of China's healthcare system, and I argue that the supply-side factors - the macro-level structural and policy imperatives tied to China's evolving healthcare system - have had a profound and long-lasting effect on the demand-side factors - the micro-level health-seeking attitudes and behaviors of individuals with respect to antibiotic use. Thus, understanding of antibiotic over-prescription in China will need to take into account both the supply-side factors and the demand-side factors.

## **1.2 Background: Prescribing Culture in China**

In this section, I describe the historical context of China's healthcare system from 1949 to the present. I argue that China's transformation from a centrally planned economy to a market economy since 1979 has brought fundamental changes to its healthcare system, and has created a series of problems that, in turn, have had a fundamental impact on the antibiotic overuse problem. In what follows, I first review the historical context starting with the Mao-era system. I then discuss the transformed healthcare system after the 1979 market reforms, including aspects such as health status and resources, health institution ownership, health insurance and assistance, national and

individual health expenditures, as well as the healthcare service delivery system in urban and rural areas. Lastly, I review some of the structural problems that are embedded in this healthcare system. I explain how they have contributed to the antibiotic overuse problem in China historically and have had a long-lasting and profound influence on individual-level health-seeking attitudes and behaviors regarding antibiotic use and prescriptions that is hard to eradicate in the present.

### *1.2.1 History: Healthcare System in the Mao era (1949-1978)*

China's healthcare system made enormous achievements during the Mao era. Before 1949, the health status of the Chinese population was among the worst in the world. During the Mao era, the average life expectancy of the population increased from 35 to 68, and infant mortality decreased from 250 to 40 deaths per 1,000 births (W. C. Hsiao, 1995). Although the standard of care was low – the 'barefoot physicians' who provided basic health services to the rural population usually had only a few months' training after secondary school (Miller, Eggleston, and Zhang, 2011) - widespread availability and the use of basic medicines including traditional Chinese medicine, as well as an active emphasis on the control of infectious disease, helped the country's health status to achieve "the most rapid sustained increase in documented global history" (Eggleston, 2012).

The healthcare system in this era was characterized by central planning, with an emphasis on 'prevention first,' community organization and cooperative financing (Hsiao, 1995). Under this system, China's mostly rural population was covered by the cooperative medical scheme (CMS). Village physicians who were overseen and paid by commune health stations were responsible for delivering primary care and providing drugs to rural residents. At its peak in 1978, 90% of China's rural population was covered by the CMS insurance program (W. Yip & Hsiao, 2008).

In urban areas, the small but growing urban population was largely covered by two types of insurance programs depending on the person's job type – the Government Insurance Scheme (GIS)

and the Labor Insurance Scheme (LIS). The GIS, financed by government budgets, covered government employees, retirees, disabled veterans, and university students; the LIS, financed by each enterprise's welfare fund, covered employees of state enterprises, their dependents, and retirees (Yip and Hsiao, 2008).

In sum, the healthcare system during the Mao era achieved enviable success in improving the Chinese population's health status. There was almost universal insurance coverage of China's population; healthcare services were paid for through insurance payments, and out-of-pocket payments were minimal. However, with the economic reforms starting in 1979, the healthcare system started to transform significantly. For three decades, the system did not perform well, leaving the majority of the population uninsured, medical services unaffordable, and the public vulnerable to adverse medical consequences (Eggleston, 2012).

### *1.2.2 Present: Healthcare System in Post-Mao Era (1979 to now)*

The turning point occurred when China embarked on its market reform in 1978, moving from a centrally planned economy toward a market economy. Since then, the central government has decentralized and shifted more power to provincial governments, and changes in healthcare policy have also followed economic policy change (Hsiao, 1995). Despite the fact that health status has continued to improve and health resources have continued to increase, it was broadly agreed that the healthcare system was not functioning well in this era (Eggleston, Ling, Qingyue, Lindelow, & Wagstaff, 2008). Insurance coverage dropped to a historic low in 1999 and then gradually increased, yet soaring personal health spending remains a heavy burden for many (Eggleston, 2012).

### 1.2.2.1 Health status and resources

The health status of the Chinese population continues to improve on the whole. The average life expectancy increased to 74.83 in 2010, up from 71.4 in 2000 and 67.7 in 1982. Infant mortality rates were also reduced to 10 deaths per 1,000 live births in 2012, from 32 in 2000 and 50 in 1991 (National Bureau of Statistics, China, 2013). This is partially due to the continuous development of the healthcare system since 1979, but is also attributable to the country's rising economic well-being and living standards (Eggleston, 2012).

Health resources have also grown since 1979. By 2012, healthcare facilities reached a total of 950,297 nationwide – more than four times that of 1980 – but have stayed relatively stable since 1985. The number of general hospitals continues to increase steadily. There are a total of 22,575 hospitals, including 15,021 general hospitals (up from 7,859 in 1980), 2,889 traditional Chinese medicine hospitals (up from 678 in 1980), and 4,665 specialized hospitals (up from 694 in 1980). (National Bureau of Statistics, China, 2013).

The number of healthcare workers has also increased. The number of employed medical personnel in healthcare institutions reached 9,115,705 in 2012, a 45% increase from 1990. Licensed physicians, including assistant physicians, reached 2,616,064 (1.94 per 1,000 people) in 2012, with 3.19 in urban areas and 1.40 in rural areas. The number of licensed nurses was 2,496,599 (1.85 nurse per 1,000 people), also higher in urban areas (3.65) and lower in rural areas (1.09) (The State Council Information Office, China, 2012).

Health resources are more available to patients and more healthcare services are used. In 2012, 6.88 billion visits were made to health institutions across the nation at all levels, over three times the number of visits in 2002 (National Bureau of Statistics, China, 2013). Although there is no data for comparison in 1980, the increase of the number of visits over the decade between 2002 and 2012 shows that a substantial amount of healthcare services is used over time. According to a white

paper on medical and health services published by the State Council in 2012, on average Chinese visited health care facilities 4.6 times per year; the number of patients admitted to hospital for inpatient care was 11.3 per 100 people; rates of the bed occupancy were 88.5%, and the average length of stay in hospital was 10.3 days per person per year; 83.3% of the residents could reach facilities within 15 minutes (The State Council Information Office, China, 2012).

#### 1.2.2.2 Ownership

Healthcare institutions are mostly public, either directly or indirectly owned by the state. Statistics in 2011 showed that 62% of hospitals are public and 38% are private (C. Wu, Tian, & Wong, 2013). In terms of market share, public hospitals provided 91% of the total service provision volume, while private hospitals (including private clinics) only accounted for 9% of all services provided (C. Wu et al., 2013). In terms of function, most of the public hospitals are general-acute hospitals; private hospitals are usually smaller, specialized, and less likely to be included in the social insurance system, such as orthopedic hospitals, eye hospitals, or dental hospitals (C. Wu et al., 2013).

Private hospitals have to compete with public hospitals for location, services offered and prices charged. Despite their relatively low status, the number of private hospitals has been increasing as the central government has opened up the healthcare services market to private investment more recently. According to a Research and Markets report, as of October 2016, there had been 15,798 private hospitals in China, accounting for 55.3% of the total hospitals; yet, the revenue of private hospitals was less than 10% of the total hospital revenue (C. Wu et al., 2013).



### 1.2.2.3 Health insurance coverage

Less than 20 years (1979-1999) after the Mao era, China's healthcare system was transformed from “one that provided preventive and affordable basic health care to all people to one in which people cannot afford basic care and many families are driven into poverty because of large medical expenses” (Yip and Hsiao, 2008). As the public has become increasingly vocal about the affordability of health care, a series of health sector reforms have been initiated to address the issue. With three major basic social health insurance programs put in place step-wise since 1997, insurance coverage has gradually increased from a historical low of 7% in 1999 to over 95% in 2010 (Eggleston, 2012).

### 1.2.2.4 Health spending

Meanwhile, national health spending has risen rapidly since 1979. The total national health expenditure was RMB 13 billion (around USD 2 billion<sup>1</sup>) in 1979, and RMB 75 billion (around USD 12 billion) in 1990. It quickly increased to RMB 579 billion (around USD 94 billion) in 2002, and further to RMB 2.785 trillion (USD 453 billion) in 2012 (National Bureau of Statistics, China, 2013). This translates into a 213 times increase in national health spending from 1979 to 2012.

Health expenditure as a share of GDP went up accordingly. It was only 3.1% in 1979, 4.0% in 1990, increased slightly to 4.8% in 2002, and reached 5.4% in 2012 (National Bureau of Statistics, China, 2013). This percentage was significantly lower than 17.9% in the U.S., 11.1% in Germany, 9.3% in Japan and OECD (Organization for Economic Co-operation and Development) countries, yet much higher than many low-and middle-income countries (Eggleston, 2012). Although health

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<sup>1</sup> US dollar amount was converted at the exchange rate of 6.3 (Price of 1 USD in CNY), March, 2015.

expenditure as a share of GDP was relatively low compared to the developed countries, the growth in health expenditure by China was the most rapid, taking into consideration the rapid growth of the national GDP that China has experienced during this period (Eggleston, 2012). This translates to a 73% increase from 1979 to 2012.

On an individual level, yearly per capita health expenditure also rose substantially. In 1979, per capita health expenditure was RMB 12.9 (USD 2.1), and RMB 65.4 (USD 10.6) in 1990. This number quickly increased to RMB 450.7 (USD 73.3) in 2002, and further to RMB 2,056.6 (USD 334.4) in 2012 (National Bureau of Statistics, China, 2013). This translates into a 158 times increase in personal health expenditure from 1979 to 2012.

Individual out-of-pocket expenditure has been rising substantially since 1979 but has gradually declined since 2001. The percent of individual out-of-pocket expenditure as a share of total health expenditure was 20.3% in 1979, grew to 35.7% in 1990, peaked at 59.0% in 2001, and gradually declined to 34.5% in 2012 (National Bureau of Statistics, China, 2013).

Among spending items, spending on pharmaceuticals as a share of total health expenditure has been persistently high by international standards. Drug spending was about 52% of all health expenditures in 1993 and declined slightly to 40% in 2010 (Eggleston, Ling, Meng, Lindelow, & Wagstaff, 2006). In comparison, drug spending as a share of total health expenditure is only 14% among OECD countries (Hsiao, 1997).

In sum, the population's health status has continued to improve, and health resources have increased substantially in the post-Mao era. However, rapid expansion of healthcare industry, large consumption of health services, and sky-rocketing medical expenses also lead to people's increasing financial burden. Particularly, the high percentage of drug spending as of total health expenditure reflects a healthcare system replete with financial incentives for the over-prescription of drugs. I will explain this in greater detail later.

#### 1.2.2.5 Health Insurance & Medical Assistance Programs

Before its opening up and market reforms in 1978, China had nearly universal insurance coverage - CMS covered China's vast rural population, and the GIS and LIS covered urban residents (Hsiao, 1995). After 1978, with the privatization of rural villages and the dissolution of the agricultural communes in rural areas, rural residents lost their health insurance overnight (Hsiao, 1995; Yip & Hsiao, 2008). In urban areas, economic privatization also caused the closing of a large number of state-owned enterprises, leading many urban employees and their dependents to lose their insurance (Yip & Hsiao, 2008). Between 1980 and 2000, the majority of China's population did not have health insurance - only 7% of the rural population had insurance coverage in 1999 (Eggleston, 2012). The situation gradually improved after the country rolled out the Urban Employee Basic Medical Insurance (UE-BMI) program in 1998, with the establishment of the New Cooperative Medical System (NCMS) in 2003, and the introduction of the Urban Resident Basic Medical Insurance (UR-BMI) in 2007 (Barber & Yao, 2010). The national rate of insurance coverage increased to 87% in 2008, and to 95% in 2011 (Eggleston, 2012).

In general, the three primary social medical insurance programs are designed to provide insurance coverage to the population based on their residential type and working status. This, in turn, determines how and how much one pays in insurance premiums and the corresponding benefit packages. In rural areas, the New Cooperative Medical System (NCMS) targets all rural residents; in urban areas, Urban Employees Basic Medical Insurance (UE-BMI) program covers all urban employees, and the Urban Residents Basic Medical Insurance (UR-BMI) program covers urban non-working residents, retirees, children and students (Barber & Yao, 2010). Supplemental to these three social health insurance programs is the Medical Financial Assistance (MFA) program. As an important part of the social health security system, it aims to protect the extremely poor and reduces

medically induced poverty (Eggleston, 2012). A brief description of the three social health insurance programs is shown in Table 1-1. Data is adapted from Barber & Yao (2010) and Eggleston (2012).

Table 1-1. Social health insurance programs

<b>Social Health Insurance Programs</b>			
	<b>NCMS (New cooperative medical scheme)</b>	<b>UE-BMI (Urban employee - basic medical insurance)</b>	<b>UR-BMI (Urban resident - basic medical insurance)</b>
<b>Date started</b>	2003	1998	2007
<b>Administration</b>	County-level	Municipal-level	Municipal-level
<b>Population</b>	Rural residents	Urban employees	Children, students, elderly, disabled, non-working urban residents
<b>Participation</b>	Voluntary at household	Mandatory for individuals	Voluntary at household
	RMB120 (USD19)	8% of employee's wages	Adults: RMB245 (USD39) Child: RMB113 (USD18)
<b>Source of fund (Premium)</b>	<u>Western provinces</u> - RMB50 (USD8): Central government - RMB50 (USD8): Local government - RMB20 (USD3): Individual contribution	<u>6+2 Model</u> - 6%: Payroll tax on employers - 2%: Employee contribution to medical saving account (MSA)	- RMB40 (USD6): Central government - RMB40 (USD6): Local government - Rest: Individual contribution

1) NCMS - Coverage, funding source & benefit model

After the dissolution of rural agricultural communes, for about twenty years, rural residents paid for their medical services completely on their own (Hsiao, 1995). With soaring medical service prices and enlarged income gap between rural and urban areas, health care became increasingly unaffordable to rural residents (Eggleston, 2012). To address this issue, the New Medical Cooperative System (NMCS) was established in 2003 (Barber & Yao, 2010). The program is voluntary at the household level, but by 2009, it covered 94.2% of its target population, around 840 million rural residents (Eggleston, 2012).

NCMS premiums are mostly paid by governments, and individuals contribute to the rest. As the NCMS has evolved, the annual premium has increased over the years. In 2003, the premium was RMB 30 (USD 5) per person in total, with RMB 20 (USD 3) coming from governments and RMB 10 (USD 2) from individuals; the premium has since increased to RMB 100 (USD 16) in 2009. Of the RMB 100 (USD 16) premium, governments contribute RMB 80 (USD 13) and individuals contribute RMB 20 (USD 3) (Barber & Yao, 2010). In 2010, the premium went up to RMB 120 (USD 19) per person, of which governments paid RMB 100 (USD 16) and individuals paid RMB 20 (USD 3) (Barber & Yao, 2010). The government contribution is mostly paid by local governments; while in poorer regions, the central government and local government each contribute half (Barber & Yao, 2010).

NCMS premiums generally form pooled funds in most provinces and medical saving accounts in some other provinces. Inpatient services can be reimbursed at certain rates through the pooled funds; outpatient services are also paid through the pooled funds primarily and medical saving accounts in some places (Barber & Yao, 2010). In 2009, around 41% of inpatient services were reimbursed through the NCMS program (Eggleston, 2012).

## *2) UE-BMI - Coverage, funding source & benefit model*

The UE-BMI, established in 1998, targets urban employees, including both formal sector employees and private sector workers (Barber & Yao, 2010). Between 1979 and 1997, only urban formal sector employees were covered by insurance (Barber & Yao, 2010; Hsiao, 1995). The Labor Insurance System (LIS) covered state-owned enterprise (SOE) employees and collectively-owned enterprise employees, and the Government Insurance systems (GIS) covered government staff and their dependents (Hsiao, 1995). With China's opening up and reforms since 1978, many of the SOEs

have closed and many urban residents became unemployed or started to work at private sector business (Barber & Yao, 2010; Hsiao, 1995). As a result, more and more urban residents became uninsured. The UE-BMI was thus established as a salary-oriented social health insurance program in response to the changing social environment (Barber & Yao, 2010). The program is mandatory at the individual level. By 2009, it covered 67% of the urban employed, around 300 million people in total (Eggleston, 2012).

The premium of the UE-BMI program is set to be 8% of one's pay; of the 8%, employers contribute 6% through payroll tax and employees contribute 2% through their payroll accounts (Barber & Yao, 2010). The premium goes into two components: 1) a social pooled fund (SPF), and 2) a medical saving account (MSA) (Barber & Yao, 2010). The design of the program and the reimbursement scheme was administrated at municipal government level (Barber & Yao, 2010).

Despite variation across cities, inpatient services and catastrophic condition expenses are generally reimbursed through SPFs, and the reimbursement rate was over 60% on average (Barber & Yao, 2010). Outpatient services and medicine are paid for through personal MSAs at a 50%-60% reimbursement rate until exhausted; individuals pay by out-of-pocket after their MSAs are exhausted, and for expenses exceeding their deductibles (Barber & Yao, 2010).

### *3) UR-BMI – Coverage, funding source & benefit model*

Before the pilot program of UR-BMI was implemented in 2007, only 31% of the total urban population was covered by the existing UE-BMI program (Barber & Yao, 2010). The UR-BMI was then established in 2010 targeting all municipalities nationwide (Barber & Yao, 2010). As mentioned above, its target population includes children, students, the elderly, disabled and other non-working urban residents - those not covered by the UE-BMI program nor by any social insurance of any kind

in the past (Barber & Yao, 2010). The program is voluntary at the household level. By 2010, it covered over 64% of its target population, around 200 million people (Eggleston, 2012).

The UR-BMI premiums are contributed to by both governments and individuals. In 2009, the estimated annual premium per person was around RMB 245 (USD 39) for adults and RMB 113 (USD 18) for minors; governments devoted a minimum of RMB 80 (USD 13) per person (Barber & Yao, 2010). In wealthier regions, local governments are held responsible for the entire RMB 80 (USD 13); while in the poorer western and central regions, the central government contributes RMB 40 (USD 6) and provincial governments contribute the other RMB 40 (USD 6) (Barber & Yao, 2010). Individuals contribute the rest of the UR-BMI annual premium.

For UR-BMI participants, inpatient services as well as some outpatient services are reimbursed through the pooled funds; most outpatient services are paid for out-of-pocket (Barber & Yao, 2010). In 2009, it was estimated that 45% of inpatient services were reimbursed through UR-BMI pooled funds (Eggleston, 2012).

#### *4) The MFA program for the poor*

The Medical Financial Assistance (MFA) program is an important part of the social health security system targeting poor residents including low-income elderly and disabled in both urban and rural areas. It was rolled out on a national scale in rural and urban areas in 2006 and 2008, respectively (Barber & Yao, 2010). The program is designed with three primary functions (1) funding premiums for poor residents to participate in the NCMS and UR-BMI programs; (2) implementing payments beyond the compensation level of basic medical insurance; and (3) providing temporary medical assistance (Barber & Yao, 2010).

Funding sources include governments at all levels (central, provincial, city, and district), the welfare lottery, social donations and fund interest income (Barber & Yao, 2010). In 2009, 93.37

million poor residents were covered by the MFA, of which one third were from urban areas and two thirds were from rural areas. More than 220 million poor residents benefitted from the MFA, of which 170 million were participants in the NCMS or UR-BMI programs (Barber & Yao, 2010).

In sum, for nearly two decades between 1980 and 2000, almost all rural residents and a majority of urban residents had no health insurance; the three social health insurance programs, namely, the NCMS, UE-BMI, and UR-BMI, which were put into place stepwise starting in 1998, helped the country to achieve 95% insurance coverage by 2011 (Eggleston, 2012). However, the current insurance coverage is called a “wide but shallow coverage” (W. Yip, Wagstaff, & Hsiao, 2009), as it covers a large share of the population but only covers a small share of their expenditures. With medical expenses increasing at a fast pace, the public is still vocal about the unaffordability of healthcare services (Eggleston, 2012).

#### 1.2.2.6 Health Delivery System

Generally, rural residents rely on a three-tier clinic-based service delivery network for their healthcare needs, while urban residents mostly rely on a three-tier hospital-based service delivery system (Yip et al., 2010). Village health clinics and community health centers provide basic primary care to rural and urban residents respectively; township health centers and county hospitals provide rural patients with referral services and receive patients with greater medical needs. In urban areas, secondary hospitals and tertiary hospitals provide patients with more comprehensive medical services. Public health organizations are supplemental to the three-tier service network in both rural and urban areas. Most of the hospitals or institutions are public, where most of the service provided (Wu, et al. 2013).



*1) Rural - Three-tier health service delivery network*

In rural areas, a three-tier health service delivery network was established with each tier operating at a different administrative level. On top are the county hospitals (including traditional Chinese medicine hospitals), followed by township health centers and then village clinics (Yip, et al., 2010). The three-tier network provides rural residents with basic health services such as primary care, prevention, health inspection and health education (The State Council Information Office, China, 2012). By the end of 2010, the network covered 2,856 counties across 31 provinces, with 6,400 county hospitals, 38,000 township health centers/stations and 648,000 village clinics (The State Council Information Office, China, 2012).

The three-tier health service delivery network is also designed with a referral system (Eggleston, 2012). Rural residents are supposed to go to village clinics, the first tier, for primary care and basic health services. If the problems need a higher level of care, patients are referred to a nearby township health center – the second tier. Services provided in township health centers include delivering babies, treating infections and wounds, and minor surgeries such as appendectomies. County hospitals – the third-tier - are the last point of referral for inpatient treatment as well as a wide range of services (Hsiao, 1997). Services provided by the rural three-tier health delivery network are summarized in the Table 1-2 below. Data is adapted from Wu et al. (2013).

Table 1-2. Rural three-tier health delivery network

**Rural Three-tier Health Delivery Network**

<b>Tier</b>	<b>Institution</b>	<b>Service provision</b>
<b>Tier-1</b>	Village clinics	Primary care, prevention services
<b>Tier-2</b>	Township health centers	Referral services, minor surgery, baby delivery, infection/wound treatment
<b>Tier-3</b>	County hospitals	Referral services, comprehensive medical services, inpatient services

Despite the fact that the three-tier network and the referral system were established to solve patients' health problems mostly in township health centers and village clinics, it has been found that township health centers do not receive many patients (Eggleston, 2012). Studies show that rural residents (1) tend to leave their health problems unattended, (2) tend to visit village clinics more frequently than township health centers, and (3) tend to bypass township health centers and go directly to county hospitals when having major health problems, despite long travel times and high transportation costs (Liu, Zhang, Lu, Kwon, & Quan, 2007).

*2) Urban - Three-tier hospital-based delivery system*

In urban areas, hospitals are organized in a three-tier scheme, providing primary and a wide range of specialized health care services. The classification is mainly based on scale (bed and staff number), coverage region, and service provision. The tertiary hospitals are on the top of the tier system, are the fewest in number, but have the most resources. Tertiary hospitals are equipped with over 500 beds and are responsible for providing high-standard and specialized medical services across regions, provinces and nationwide. They are also responsible for providing technical guidance to lower-level hospitals. Secondary hospitals are regional hospitals. They are equipped with 100-500

beds and provide general medical services to multiple communities in one region. Primary hospitals – being at the bottom of the tier system – are the greatest in number, cover a single community, and have the fewest resources. They are equipped with 20-100 beds, and are responsible of primary care as well as preventative and rehabilitation services in the single community. For a summary, see Table 1-3. Data is adapted from Wu et al. (2013).

Table 1-3. Urban three-tier hospital-based delivery system

**Urban Three-tier Hospital-based Delivery System**

<b>Tier</b>	<b>Institution</b>	<b>Region</b>	<b>Service provision</b>
<b>Tier-1</b>	Community health centers	Community level: single community	Primary care, prevention, rehabilitation services
<b>Tier-2</b>	Secondary hospitals	Regional level: multiple communities	General medical services
<b>Tier-3</b>	Tertiary hospitals	Cross-regional level: multiple regions	High-standard, specialized medical services

With the three-tier hospital-based system, urban residents are supposed to follow a referral system for their medical visits. They visit primary hospitals in their community for prevention, rehabilitation services, and primary care for common and minor health conditions. Patients with major health conditions should be referred to regional secondary hospitals. Patients with unresolved and severe conditions should then be referred to tertiary hospitals for higher-standard care and specialized care.

Although the abovementioned referral system exists and the social health insurance programs limit coverage for healthcare services outside patients' given locality (county and municipality), patients are free to choose whichever level of hospital they wish and can pay for. The hospital referral system is considered to exist in name only. This results in the overloading of

outpatient service departments in tertiary and secondary hospitals (Li & Xie, 2013), a major problem in the current urban health care service delivery system. A small number of hospitals, especially the tertiary hospitals in metro cities, serve a disproportionate volume of patients, including for minor conditions. The resultant high-level occupational stress among physicians is significantly associated to physicians' low perceived professional efficacy, dissatisfaction with physician-patient relationship, high over-commitment, low decision authority, and low skill discretion (H. Wu et al., 2013).

Table 4 below shows how service is disproportionately provided across different tiers of hospitals. Tertiary hospitals constitute 10% of all hospitals, but provide 38% of all outpatient services and 36% of all inpatient services. In comparison, primary hospitals comprise 42% of hospitals, but their service provision is much less than that of tertiary hospitals – 10% of outpatient services and 5% of inpatient services (shown in Table 1-4). Data is adapted from Wu et al. (2013).

Table 1-4. Service provision distribution in urban three-tier hospitals

<b>Service Provision Distribution in Urban Three-tier Hospitals</b>				
<b>Institution</b>	<b>Share of market (by number)</b>		<b>Share of OP services provision</b>	<b>Share of IP services provision</b>
<b>Community health centers</b>	42%	(5636)	10%	5%
<b>Secondary hospitals</b>	48	(6468)	52	59
<b>Tertiary hospitals</b>	10	(1399)	38	36
<b>Total (N)</b>	100%	(11403)	100%	100%

A ubiquitous slogan that captures the average urban Chinese patient's concern about access to appropriate and high-quality care is "*kan bing nan, kan bing gui*" (getting health care is difficult, and getting health care is expensive) (Eggleston, 2012), as they have to wait longer, communicate less, and pay more, especially when seeking care in the overwhelmingly overloaded hospital environment.

#### 1.2.2.7 Public health service institutes

Supplemental to the urban hospital-based delivery system and the rural three-tier delivery network are public health organizations such as the China Center for Disease Control (CDC), specialized disease prevention and treatment organizations, health education centers, health inspection institutions, maternal and child health centers, and family planning service centers. These organizations provide public health services to both urban and rural residents, ranging from planned immunization, maternal and child health care, folic acid supplements for rural women, mass screening for breast cancer and cervical cancer, physical examinations for the elderly, and the establishment of health records.

In sum, people rely on two separate systems in rural and urban areas for healthcare service delivery - the rural three-tier delivery network and the urban three-tier hospital-based delivery system. Although the two delivery systems are both designed with a referral system, patients are free to choose where they wish to go for medical visits. Thus, the rural delivery network is characterized by the underuse of the township health centers, and the urban delivery system is characterized by the over-use of tertiary hospitals.

#### *1.2.3 Organizational Factors in the Drug Over-prescription Problem*

How well a government organizes its healthcare system and motivates physicians to do their best for patients and society is consequential for people's health and the efficacy of the healthcare system (Eggleston & Hsieh, 2004). It has been recognized that the changes introduced during the market reform era created an incentive system for hospitals and physicians that is not appropriate (Yip et al., 2010; MOH, China, 2010). As a result, it is widely believed that the widespread over-prescription of drugs, and antibiotic over-prescribing in particular, is significantly influenced by the

supply-side incentive system and several organizational factors behind it (Currie, Lin, & Zhang, 2011; Y. Li, 2014; Yongbin Li et al., 2012; W. C.-M. Yip, Hsiao, Meng, Chen, & Sun, 2010).

The organizational factors as well as the incentive system include (1) underfunded public hospitals, (2) underpaid healthcare providers, (3) unregulated practices of pharmaceutical businesses, and (4) the low skill and qualifications of healthcare providers in rural areas. In what follows, I explain how these organizational factors have created perverse incentives for physicians to over-prescribe, or directly resulted in the over-prescription of drugs, especially antibiotics.

#### 1.2.3.1 Underfunded public hospitals and distorted pricing policies of drug sales

Public hospitals dominate China's healthcare system, yet they only receive a minimal amount of funding support from the government. Thus, they have to rely on drug sales for survival. As mentioned earlier, public hospitals account for 62% of health institutions in China, and they provide 91% of the healthcare services (Wu et al., 2013); however, after the country embarked on market reforms in 1979, the central government reduced subsidies to public hospitals from more than 50% to about 10% (Eggleston, 2012). As a result, user fees and drug sales have become a major source of revenue for public hospitals to survive financially (Yip et al., 2010). It was estimated that drug sales accounted for over half of hospital revenues, with antibiotics accounting for 47% of all drug sales (Currie et al., 2011; Yip et al., 2010).

Moreover, a 15% mark-up policy for hospital drug sales has been in place for at least two decades since the market reforms in 1979, which has further influenced providers' prescribing behaviors over the past three decades. To ensure that basic health services remain affordable even for the poor, the government set prices for these services below cost; however, it allowed a 15% profit margin for drugs prescribed and set the prices for new and high-technology diagnostic services above cost (Yip et al., 2010). Yip et al. (2010) argued that these pricing policies thus caused

an erosion of professional medical ethics, and over-prescription driven by financial profit has become widespread in China (Yongbin Li et al., 2012).

A popular slogan “*yi yao yang yi*” (hospitals and physicians rely on drug sales for survival) characterizes this problem. Prescribing for profit has been recognized as a remarkable problem in the healthcare system, contributing to rising medical expenses, patient distrust and the over-prescription of drugs in China (Zhu, 2012). Zhu (2012) found that drug expenditures account for 45% of health expenditures on average – the highest in the world; also, the sales volume of drugs is positively associated with drug price – the higher a drug’s price, the more it is sold.

In sum, insufficient government support for public hospitals has created perverse incentives for public hospitals to generate revenues through drug sales. The pricing policies such as the 15% mark-up policy have made it possible for hospitals profit by selling drugs to patients. The funding scheme of public hospitals and pricing policies have significantly contributed to the problem of drug over-prescription that China has experienced, and have shaped the prescribing culture over the past several decades.

#### 1.2.3.2 Underpaid health providers & low-priced healthcare services

Similar to the situation in hospitals, physicians as employees of public hospitals also rely on drug sales for survival (Zhu, 2012). The basic salaries of health providers in public hospitals have remained low, similar to those of government staff according to their professional rank and length of service (Yip et al., 2010). A survey conducted by a renowned online forum for health providers reported that 75% of respondents had an annual income of less than RMB 40,000 (around USD 6,452) – less than RMB 3,300 (USD 524) monthly (Global Times, 2009). Despite the increase in average individual income across economic sectors, as well as the fast increase in the per capita GDP over the past three decades, the income of physicians has not changed much over the years, and it

ranks behind the income levels of many other sectors such as IT, finance, scientific research, entertainment and logistics (Global Times, 2009).

Moreover, in order to ensure that healthcare services are affordable to everyone, even to the poor, the government has set the price of physicians' consultation services extremely low, at around RMB 2 (USD 30 cents) per visit. Therefore, both hospitals and physicians cannot survive on this income source alone. To generate profit to fund expansions in beds and technology, physicians are encouraged to prescribe more (Yip et al., 2010). As a result, a greater proportion of their income comes from sources other than basic salary.

A major source of income for physicians is performance pay, which is determined by the amount of profits generated by the physicians, primarily through drug sales (Yip et al., 2010). Performance pay accounts for a large proportion of the provider's income, sometimes 3-8 times their basic salary, though this varies by physicians' rank, type of the clinic, and geographic location. Although there is no existing data on how much physicians can earn through performance pay, a regulation put forward by the Shenzhen municipal government on hospital performance pay in 2012 can provide us with some insight. This policy stipulates that the performance pay of hospital leaders cannot exceed 300% of the average income of all hospital employees; the performance pay of hospital deputy leaders cannot exceed 200% of the average income of all hospital employees; and the performance pay of a clinic department director cannot exceed 150% of the average income of all hospital employees (Zhu, 2012). Furthermore, commissions or bonuses provided by pharmaceutical companies are also a regular source of income for physicians (Zhu, 2012). This part of income can be 2-3 times a physician's basic salary and can vary by the type of physician and drug.

In sum, the low compensation of health providers has created perverse incentives for physicians to over-prescribe drugs, including antibiotics. Their income from prescriptions of drugs comes both through performance pay provided by the hospital and from commissions or bonuses



offered by pharmaceutical companies. Next, we will discuss the practices by which pharmaceutical companies compensate individual health providers and hospitals for over-prescribing drugs.

### 1.2.3.3 Unregulated practices of pharmaceutical businesses

As mentioned above, both hospitals and physicians rely on drug prescriptions as a major source of income that is important for their own survival. It is widely acknowledged that hospitals regularly receive “kickbacks” and physicians receive “bonuses” from pharmaceutical businesses for prescribing their products (Yip et al., 2010; Yip & Hsiao, 2008). Together, such practices by pharmaceutical companies create further financial incentives for over-prescription.

Kickbacks paid to hospitals take various forms. On the first level, public hospitals, given their monopoly position in the healthcare service provision market, are able to collaborate with pharmaceutical businesses to set a nominal purchase price that is several times higher than its factory price for certain drugs (Zhu, 2012). Zhu (2012) also provides an example of how such kickbacks work: if the actual factory price of a medicine is \$2; with the 15% mark-up, \$0.30 cents can be added to the retail price of the medicine sold at the hospital and it can be kept by the hospital as profit. However, if the hospital and the pharmaceutical business agree to set the purchasing price at \$20 instead of \$2, \$3 can be added to the retail price legally as profit. Furthermore, pharmaceutical businesses will give the \$18 margin to the hospital as a kickback. In this case, the hospital gains \$21 in total as profit (this amount partially goes to hospital administrators, and partially goes to individual physicians). In addition, pharmaceutical kickbacks to hospitals can take an even more subtle form. For example, some pharmaceutical businesses allow hospitals to pay what they owe 6-12 months later. This then becomes an invisible loan to hospitals, at zero interest (Zhu, 2012).

On the individual physician level, besides providing monetary kickbacks as mentioned above, pharmaceutical businesses also conduct “rapport-building” or “rebating” practices including

organizing conference tours, buying lunches and beverages for physicians during their busy schedule, and offering gifts, practices similar to those described by (Rodwin, 1993) in *Medicine, Money, and Morals*, on physicians' conflicts of interest in the United States.

In sum, the business practices of pharmaceutical companies strengthen the financial incentives for the over-prescription of drugs both at the institutional level and the individual level. With little monitoring or regulation at the organizational level to oversee hospitals' or physicians' practices and conflicts of interest, over-prescription driven by financial incentives is widespread.

#### 1.2.3.4 Low skill and qualifications of health providers in rural areas

The simple fact that health professionals are insufficiently trained also contributes to the over-prescription problem. Studies show that the over-provision of drugs is rampant in rural China, alongside the provision of expired and counterfeit drugs (Yip, et al., 2010). The problem of low skilled and low quality health professionals is particularly severe in rural areas (Yip, et al., 2010). It is widely agreed that rural residents receive far lower quality healthcare services compared to urban residents (Eggleston, 2012). The skills of village health providers are low. Studies have shown that 70% of them have achieved less than a high school degree and have received only 20 months' medical training on average (Eggleston et al., 2008; Z. Wang & He, 2003). Moreover, these providers rely half on their medical practice and half on farming to make their living (Hsiao, 1997).

In addition, the service quality of county hospitals, which are considered the highest level for rural residents, is not as good as that of average hospitals in urban areas (Hsiao, 1997). (H. Wang et al., 2013) conducted a study in four township health centers and eight village health clinics in Chongqing and Gansu and found that less than 2% of drug prescriptions were 'rational' in township health centers and village clinics, and only 0.06% of drug prescriptions in village clinics were reasonable (Wang et al. 2003).

In sum, the aforementioned organization factors, encompassing insufficient funding support from the government, low compensation for healthcare providers, unregulated business practices of pharmaceutical companies, as well as low-skilled rural healthcare providers have all shown to play a role in antibiotic over-prescribing in China. These supply-side factors, brought about by the policy changes related to the healthcare system in the post-Mao era, not only directly influence physicians' prescribing behaviors by creating a perverse incentive structure; moreover, they also indirectly influence patients' health-seeking behaviors and attitudes by shaping a medical culture that is replete with over-provision and inappropriate use of medical services, including antibiotics.

Given the scale and magnitude of antibiotic over-prescribing in China and the acknowledgement of the effect of supply-side incentive system on over-prescribing, major policy changes have been initiated to address the issue by reforming the supply-side incentive system. For example, a 'zero mark-up' policy has replaced the old '15% mark-up' drug policy since 2009, removing the perverse incentive tied to physicians' prescribing; in addition, antibiotic stewardship programs were launched in selected hospitals since 2012, monitoring and regulating physicians' antibiotic prescriptions by sanctioning over-sized prescriptions, e.g., suspension of professional licenses, removal from post (L. Wang, Zhang, Liang, & Bloom, 2016; Xiao et al., 2013).

Despite these policy initiatives, it is found that antibiotic prescription rates have remained high and bacterial resistance rates are growing rapidly (He et al., 2017; J. Wang, Wang, Wang, Zheng, & Xiao, 2014; Xiao et al., 2013). This thus poses the question: Do supply-side factors fully explain the high prevalence of antibiotic over-prescription in China? More specifically, do demand-side factors such as patients/caregivers' health-seeking attitudes and behaviors also contribute to this problem? This dissertation is motivated by these research questions.

To answer this demand-side research question, I use mixed methods. First, a community-based cross-sectional survey is conducted (1) to estimate the nationwide prevalence of pre-visit self-

medication and desire for antibiotic prescriptions, (2) to examine the effect of such caregiver attitudes and behaviors on physicians' antibiotic prescriptions; and (3) to identify key population groups that are more prone to the behavior of self-medication and desire for antibiotic prescriptions. Second, a conversation analytic study is conducted to investigate physician-patient/caregiver interaction in naturally occurring pediatric encounters with respect to (1) caregivers' overt advocacy for antibiotic prescriptions, and (2) physicians' responses to caregivers' treatment advocacy and actions taken to make treatment recommendations.

Our results reveal that demand-side factors significantly contribute to the high prescription rates of antibiotics in China. The survey study shows that use of non-prescribed antibiotics is prevalent among caregivers for their children's upper respiratory tract infection symptoms, and this behavior is not only associated with a higher likelihood of caregiver desire for antibiotic prescriptions, and IV drip antibiotic prescriptions in particular, but is also directly and indirectly associated with physicians' prescriptions of the treatment.

The conversation analytic study demonstrates that while physicians are not “selling hard”, the caregivers are pushing hard for physicians' prescriptions of antibiotics. Compared to caregivers in American pediatric encounters, Chinese caregivers not only advocate for antibiotic treatment more overtly, but also do so more frequently. The statistical tests find that caregivers' use of such overt advocating actions is significantly associated with physicians' prescriptions of antibiotics. Moreover, what is most striking is that caregivers' advocacy is primarily for drip antibiotic treatment in the Chinese pediatric context, whereas this is scarcely even an available option in the American pediatric outpatient context.

On the other side, following the supply-side theory, one would expect physicians to recommend antibiotic treatment much frequently and in an authoritarian way; yet the results reveal that this is not the case. First, while antibiotics are prescribed to the patients in 59% of the cases,

they are initially recommended to the patients in only 40% of the cases. Second, physicians also tend to use less authoritarian forms of treatment recommendation actions in the Chinese context than in the American clinic context; moreover, even when more authoritarian forms of action are used by Chinese physicians, they are usually mitigated. This study of physician-caregiver interaction in pediatric encounters thus provides qualitative evidence that demand-side factors significantly contribute to the over-prescription of antibiotics in the clinic setting.

Although both quantitative and qualitative evidence point to the significant impact of demand-side factors on the high prevalence of antibiotic over-prescription, this is not to say that supply-side factors do not have an effect at all. What this dissertation aims to show is that on the one hand, caregivers display a high level of agency and entitlement in advocating for antibiotic prescriptions in medical consultations and thus put physicians under a greater amount of pressure for over-prescribing; while on the other hand, antibiotic over-prescribing is also attributable to physicians' acquiescing attitude toward caregivers' advocacy for antibiotic treatment. Together, the findings of this dissertation highlight the long-neglected role of demand-side factors as an important contributor to the high prevalence of antibiotic prescription in China, in addition to the much discussed supply-side factors. In the following, I describe the data and methods that I use in answering this question, as well as the organization of the chapters.

### **1.3 Data & Methods**

In this dissertation, using mixed methods, I analyze two data sets that I collected and constructed for answering my research questions. In the following, I first introduce the two data sets, including (1) a survey data set, and (2) a medical interaction data set; I then briefly describe the methods that I use, including (1) survey, (2) Conversation analysis, and (3) Conversation analysis and quantitative analysis.

### *1.3.1 Data*

#### *1.3.1.1 Survey data*

To examine caregiver attitudes and behavior regarding antibiotic prescriptions prior to medical visits, I conducted a community-based cross-sectional survey among caregivers of children between 3 to 10 years old in 34 geographical sites, 21 provinces across China between October and December, 2013. A 13-item self-administrated questionnaire was developed regarding caregiver pre-visit use of non-prescribed antibiotics for their children's upper respiratory tract infection symptoms, their desires for antibiotic prescriptions in the visit, and the effect of their desires for antibiotic prescriptions on physicians' prescribing decisions in their most recent medical visit. This results in a nationwide sample of 3,056 questionnaire responses entered for analysis.

#### *1.3.1.2 Medical interaction data*

To investigate treatment negotiation between caregivers and physicians, I video-recorded 318 pediatric encounters, spanning 6 hospitals (at 3 tiers), 9 physicians, and 318 patients with their caregivers between September and December in 2013; the data were then transcribed and analyzed using Conversation Analysis (CA) transcribing conventions (Jefferson, 2004). This results in a corpus of video-recorded and manually transcribed medical conversations of around 500,000 Chinese characters. Detailed analytical procedures are described separately in Chapter 3 and Chapter 4 with regard to caregiver overt advocating actions and physician prescribing behaviors, respectively.

### 1.3.1.3 Ethical consideration

The University of California, Los Angeles (UCLA) Institutional Review Board (IRB) approved all study procedures for the duration of the study (IRB#13-000748). No identifiable information was involved in the study.

## *1.3.2 Methods*

### 1.3.2.1 Survey

In Chapter 2, Descriptive analysis is used to estimate prevalence of caregiver pre-visit use of non-prescribed antibiotics, their desires for antibiotic prescriptions, and prescribing outcome; logistic regressions are conducted to investigate bivariate relationships between the three variables (i) caregiver use of non-prescribed antibiotics, (ii) their desire for antibiotic prescriptions, and (iii) the prescribing outcomes, and mediating analysis is conducted to analyze the relationship among the three variables; lastly, logistic regression models are estimated to identify risky population groups who are more prone to the use of non-prescribed antibiotics, desire for antibiotic prescriptions, for which intervention programs can be most effectively targeted. Sampling methods, inclusion and exclusion criteria, variable constructions will be discussed in greater detail in Chapter 2.

### 1.3.2.2 Conversation analysis

In Chapter 3 and Chapter 4, Conversation analysis (CA) is used as the primary methodology to identify caregivers' overt advocating actions for antibiotic prescriptions and physicians' prescribing behaviors in naturally occurring Chinese pediatric encounters. Here, I provide a brief introduction of the method to explain why CA is used (1) to analyze actions that I am interested in, and (2) to analyze the social relationship between the actors who produce these actions.

## 1) CA as a method to analyze social actions

Inspired by Erving Goffman and Harold Garfinkel, CA was developed in 1960s by Harvey Sacks, Emanuel Schegloff, and colleagues, as a rigorous approach to the study of social interactions, and more essentially, social orders. At its core, CA assumes that there may be order at all points in social activities (Sacks, Schegloff, & Jefferson, 1974). For conversation analysts, conversation is just one form of social activity which is directly accessible and the very details of actual social events and conducts could be captured in their entirety and re-examined repeatedly (Drew, 2005).

An extensive body of theory and empirical research has been devoted to showing that there is normative structuring and shared logics underlying participants' courses of actions in conversation, and that such a 'micro-order' of social interactions not only makes possible the intelligibility of the social actions (Heritage, 2005), but also forms the very foundations of the so-called 'macro-order' of society (Schegloff, 2006). It is in this sense that CA was developed as a method to serve the broader enterprise of building a stable, reproducible, cumulative, natural observational science of social action, and hence of society (Drew, 2005; Sacks, 1984; Schegloff, 1992).

Specifically, the 'micro-order' or structural organization of conversation can be operationalized at three different levels in conversation: (1) *Actions*: the main job being undertaken in a turn. Rather than being primarily concerned with what words and other language particulars "mean", conversation analysis focuses on the function that turns have including what sort of response is invited or even normatively required by a given action. (2) *Sequences*: how a sequence of turns is organized in a trajectory, through which courses of action are enacted coherently and orderly. For example, 'Are you free tonight?' can be understood as a preliminary to a base adjacency pair of invitation-acceptance. Sequences are the vehicle for getting activities accomplished



(Schegloff, 2007; Stivers, 2010). (3) *Overall organization*: how multiple, ordered sequences are organized to accomplish particular project (e.g., a medical project normally involves six ordered activities – *problem presentation, history-taking, physical examination, diagnosis, treatment, closing*) (Robinson, 2012; Schegloff, 2007).

In addition to this structural view of conversation, there is also a dimension of morality in the systematic organization of social interactions. Related work encompasses: *preference organization* (Pomerantz, 1984; Pomerantz & Heritage, 2013), *repair organization* (Kitzinger, 2013; Schegloff, Jefferson, & Sacks, 1977), as well as displays and negotiations of *epistemic authority* (Heritage & Raymond, 2005, 2012) and *deontic authority* (Stevanovic & Peräkylä, 2012).

The systematic organization of conversation is fundamental to the smooth functioning of society, as participants constantly rely on conversation's organizational resources as shared sense-making practices in producing and understanding actions with each other. What is intriguing about this sense-making process is that whether an action of a speaker is understood as performing a particular action is not only discernable to the participants in the listener's subsequent turn, but is also discernable to the analysts simultaneously – an analytical procedure called 'a next turn proof procedure' in CA. For this reason, in identifying actions of interest, conversation analysts look at both the sequential position and the composition of turns at talk, relying on detailed transcripts of naturally occurring conversations.

## 2) CA as a method to analyze social relationships

Related to this sense-making process that involves the participants' shared knowledge and practices of systematic organization of conversation is their reliance on the analyses of the contextual knowledge of the social relationship, the local interactional environment, and the larger activity in which the participants are engaged (Pomerantz and Mandelbaum, 2005). Particularly, as

Pomerantz and Mandelbaum (2005) put it: “persons assume that incumbents of specific relationship categories should conduct themselves in ways that are consistent with the rights, obligations, motives, and activities regarded as proper for incumbents of the relationship categories, or be accountable for the discrepancy” (p.150).

Since its inception, CA has investigated how participants put their knowledge of relationship categories to use in interaction, how the knowledge, understanding, and assumptions related to relationship categories are drawn on in the normal course of accountable social and work-related activities; although enacting incumbency in a relationship category is not the focal activity in most cases, yet sensitivity to incumbency in a relationship may account for the particular ways in which these actions are implemented (Pomerantz and Mandelbaum, 2005, p167). Thus, by looking at the ways that actions are implemented, we can also understand the kind of social relationship at play and the kind of incumbents associated with the relationship categories.

### 1.3.2.3 Conversation analysis and quantitative analysis

Based on the conversation analysis of the physician-caregiver interaction of medical interaction data set, I also conduct quantitative analysis to examine the bivariate relationships between the conversation actions and variables such as prescribing outcomes. In particular, I use CA as a basis for operationalizing variables that can then be coded. Once coded I am able to test for associations between variables. This mixed methodology thus aims to provide not only an understanding of the process and mechanism through which over-prescription of antibiotics are enacted in medical interactions, but also a quantitative estimation of the significance of the associations between the actions and the prescribing outcomes.

## **1.4 Roadmap**

In the following, I will first discuss the survey study of caregivers' pre-visit self-medication behavior, desire for antibiotic prescriptions, and their effects on prescribing outcomes in Chapter 2; next, I will discuss the conversation analytic study of physician-caregiver interaction in Chinese acute pediatric encounters – caregivers' overt advocating actions for antibiotic prescriptions will be discussed in Chapter 3, and physicians' prescribing behaviors will be discussed in Chapter 4; finally, I will discuss the primary findings and conclude the study in Chapter 5.

## Chapter 2

### Caregiver Self-medication, Desire for Prescriptions, and Physicians' Antibiotic

#### Prescriptions: A Cross-sectional Survey

##### 2.1 Introduction

Antibiotic resistance is one of the biggest global public health crises today. When bacteria become resistant to antibiotics, our miracle drugs fail to treat and some of the most common illnesses become fatal again (Ventola, 2015; Zoorob, Sidani, Fremont, & Kihlberg, 2012). The problem is further exacerbated by the fact that the pipeline for developing new antibiotics is running dry (Boucher et al., 2009; Shlaes, Sahm, Opiela, & Spellberg, 2013), at least partially because the pharmaceutical industry lacks the financial incentives to develop new antibiotics that could cure conditions in weeks rather than years (Brogan & Mossialos, 2013). As the General Secretary of the WHO remarked, the emergence and spread of antibiotic resistance could be the end of modern medicine (Chan, 2012).

Multiple and rising levels of resistance have been discovered worldwide. According to the WHO surveillance report, *Streptococcus Pneumonia*, which is the primary cause of childhood pneumonia and other infections, has been found to be up to 73% resistant to penicillin; *Klebsiella Pneumoniae* was found up to 82% resistant to 3<sup>rd</sup> generation cephalosporins; *Methicillin-resistant Staphylococcus Aureus (MRSA)*, the superbug which is often associated with patients with hospital-acquired infections, was found as high as 90% in some parts of the world (WHO, 2014).

The costs caused by resistance are huge. It was estimated that at least 2 million people become infected with bacteria that are resistant to antibiotics and at least 23,000 people die each year as a direct result of these infections in the United States; overall societal costs were up to \$20 billion directly and \$35 billion indirectly (CDC, 2013). The burden is even greater for many developing

countries. For example, in Thailand, with a population of 70 million (1/5 of the US), resistant pathogens caused more than 38,000 deaths a year and increased hospital stays by over 3.2 million days in total (WHO, 2013).

Antibiotic over-prescriptions for Respiratory Tract Infections (RTIs) are of particular concern. RTIs represent the primary target for antibiotic prescriptions (Goossens, Ferech, Vander, Elseviers, & ESAC Project Group, 2005; Harris, Hicks, & Qaseem, 2016). Inappropriate prescriptions of antibiotics have remained common for RTIs (Gulliford et al., 2014; Kronman, Zhou, & Mangione-Smith, 2014; Teng, 2014), contributing to the escalating level of antibiotic resistance (Costelloe, Metcalfe, Lovering, Mant, & Hay, 2010; Del Mar et al., 2012).

Within this clinical setting, children are a particularly vulnerable group. RTIs have long been the leading cause of childhood deaths, especially among younger children (Global Burden of Disease Pediatrics Collaboration, 2016). Pediatricians frequently prescribe antibiotics to children for RTIs (Hersh, Shapiro, Pavia, & Shah, 2011); data from the US outpatient antibiotic prescribing showed that children were the primary consumers of antibiotics, consuming almost three times as many antibiotics as older patients (Hicks et al., 2015).

Besides over-prescriptions of antibiotics in the clinical setting, patient-related factors such as self-medication have been identified by the WHO as one of the important contributors to inappropriate use of antibiotics (WHO, 2001). It was estimated that more than 50% of antibiotics worldwide are purchased privately without prescriptions, from street vendors in the informal sector (Cars & Nordberg, 2005). The practice is often associated with shorter courses of treatment than is standard, with inappropriate choices of drugs and dosage, and with masking of the underlying infectious process. All these factors are likely to cause treatment failure and are consequential for antibiotic resistance (Morgan, Okeke, Laxminarayan, Perencevich, & Weisenberg, 2011). A community-based study in Thailand found that bacterial resistance including penicillin-resistant and

erythromycin-resistant *Streptococcus Pneumoniae* was significantly associated with increasing non-prescription use of antibiotics (Apisarnthanarak & Mundy, 2008).

While this practice is found across the world, it is much more common in developing countries, where sales of antibiotics are less strictly regulated and policies are ineffectively enforced. The prevalence of non-prescribed use of antibiotics is less than 1% on average in northern Europe; whereas it accounts for 19-100% of antibiotic use in areas outside north Europe and North America ( Grigoryan et al., 2006; Grigoryan et al., 2010; Morgan et al., 2011). In Asian developing countries, households routinely stocked antibiotics: 55% of Vietnamese families have antibiotics at home (Okumura, Wakai, & Umenai, 2002) and 42% of the Mongolian caregivers reported having used non-prescribed antibiotics to treat symptoms in their child during the previous 6 months (Togoobaatar et al., 2010).

In China, the problem of antibiotic overuse and resistance is particularly concerning. Recent research showed that China has been the biggest manufacturer and consumer of antibiotics in the world; in the year 2012, more than 200 types, approximately 162 million tons of antibiotics were consumed (Zhang, Ying, Pan, Liu, & Zhao, 2015). The resistance rates of various pathogens have reached alarming levels. *Streptococcus Pneumoniae* resistant to macrocodes was 70%, and the proportion of *MRSA* was up to 60% in 2010 (Mei & Tong, 2012; Xiao, Shen, Wei, Chen, & Kong, 2012). The high resistance rates are also accompanied by rapid growth – the annual growth rate of antibiotic resistance was on average 22% (1994-2000) as compared to only 6% in the United States (Zhang, Eggleston, Rotimi, & Zeckhauser, 2006). With the biggest population in the world and an increased frequency of global travel and exchange, antibiotic resistance in China poses a serious risk to global public health.

Moreover, inappropriate use of Intravenous (IV) antibiotics is widespread. Although reliable statistics on consumption are not available, it was reported that 10.4 billion bottles of infusion fluid

were produced in a year – around eight bottles per person if consumed (Yuan, 2014). IV antibiotics are usually reserved for treatment of severe acute infections, which could not be treated effectively with oral or enteral medications (Shiu, Wang, Tejani, & Wasdell, 2013). Clinical guidelines from the US and UK suggest that IV antibiotics were recommended for very limited conditions, and only patients with severe clinical presentations are considered for IV therapy (Harris et al., 2016; Hersh, Jackson, Hicks, & American Academy of Pediatrics Committee on Infectious Diseases, 2013; NICE, 2013). In contrast, IV antibiotics can be prescribed to patients presenting with rather mild conditions such as the common cold in Chinese outpatient care settings. A community-based study in Canada reported that less than 5% of the patients presenting to the emergency department with Community Acquired Pneumonia (CAP) received IV antibiotics (Carrie & Marrie, 2005); whereas a community-based study in China found that over 30% of the outpatient antibiotic prescriptions were for injections or IV infusions, which was three times more than other low-to-middle-income countries (Li et al., 2012).

The practice of self-medication with non-prescribed antibiotics is well known in China. Although the Chinese State Food and Drug Administration has enacted measures to forbid retail pharmacies from selling antibiotics without a prescription (China Food and Drug Administration, 2003), antibiotics are still easily purchased without prescriptions for self-medication use (Jiang et al., 2013; Yu et al., 2013). Retail pharmacies have been important suppliers of antibiotics, accounting for more than 30% of the total volume of sales of antibiotics a year and the number is still rising steadily (Wan et al., 2013).

Despite its known prevalence, research on the caregiver use of non-prescribed antibiotics, their predictors, as well as their impact on caregivers' healthcare seeking behavior and attitudes is still limited. Bi, Tong, & Parton (2000) reported that 51% of children have received parental self-medication of antibiotics; Yu et al. (2014) reported that 62% of parents had used non-prescribed

antibiotics with children before medical visits; however, their studies were based on small samples from one urban city and two rural counties respectively. Little is known about the prevalence of this practice across rural and urban areas, at varying levels of economic, political and cultural development.

Moreover, despite a large body of western literature on patient desires as an important contributor to antibiotic over-prescriptions, the effect of caregiver desires for antibiotic prescriptions in the Chinese RTI clinical context has remained unknown. Research from the UK and US has shown that caregiver desires and physicians' perception of parental expectations for antibiotics can significantly increase the likelihood of physicians' over-prescription of antibiotics (Macfarlane, Holmes, Macfarlane, & Britten, 1997; Mangione-Smith, Elliott, Stivers, McDonald, & Heritage, 2001; Stivers, Mangione-Smith, Elliott, McDonald, & Heritage, 2003), and patient desires were cited by physicians as the most common reason for over-prescribing (Elwyn, Gwyn, Edwards, & Grol, 1999; Epstein, Read, & Winickoff, 1984; Linder & Singer, 2003). It is thus plausible that over-prescriptions of antibiotics, and in particular IV antibiotics, in China is at least partially due to caregivers' desires for antibiotic prescriptions from their physicians in medical visits.

In addition, since self-medication with non-prescribed antibiotics has not been a significant issue for most of the middle-to-high-income countries in western societies (Grigoryan et al., 2006, 2007, 2008, 2010), its influence on caregivers' healthcare seeking attitudes such as desires for prescriptions in the visit, and further, on physicians' prescribing decisions has largely remained uninvestigated to this date. Given the prevalence of use of non-prescribed oral antibiotics among caregivers before medical visits and the high prescription rates of IV antibiotic infusions in China, I thus hypothesize that there is a causal relationship between caregiver use of non-prescribed antibiotics before medical visits, their desires for IV antibiotic prescriptions in the visit, and physicians' prescriptions of IV antibiotic prescriptions at the end of the visit.



To identify the predictors of caregivers' use of non-prescribed antibiotics, many studies have found child age as a significant factor (Bi, Tong, & Parton; 2000; Yu et al., 2014); other work was mostly concerned with caregivers' knowledge and attitude toward antibiotic use and concluded that caregiver low level of knowledge on antibiotic use was associated with self-medication (Lv et al., 2014; Yu et al., 2014). However, understanding is lacking with respect to what kinds of caregivers are more prone to these behaviors, i.e., their socio-demographic characteristics and their views toward their child's health conditions. The same is true with our understanding of the predictors of caregivers' desires for antibiotic prescriptions and their desires for IV antibiotic prescriptions.

In the debate over whether China's vast amount of antibiotic over-prescription is a supply-side (provider-driven) problem or a demand-side (patient-driven) problem, existing research has overwhelmingly attributed this problem to the supply-side factors, i.e., China's healthcare system and the associated perverse incentives for physicians to over-prescribe (Li et al., 2012; (Currie, Lin, & Zhang, 2011; Li et al., 2012; Yip, Hsiao, Meng, Chen, & Sun, 2010). However, contrasting evidence also exists indicating that physicians are not deliberately over-prescribing IV treatments to earn more or boost their performance evaluation (Yuan, 2014). Although a small number of interview-based studies reported that overuse of IV antibiotics could be attributable to patient misconceptions of IV antibiotics (Reynolds & McKee, 2009, 2011); empirical evidence is still lacking with respect to patient-related contributors to over-prescriptions of antibiotics, and particularly, IV antibiotics in China for children's common RTIs symptoms.

This study thus aims to (1) estimate the prevalence of caregiver use of antibiotics before medical visits, (2) examine the caregivers' desire for medical service or prescriptions in the visits,(3) determine the effect of caregiver use of non-prescribed antibiotics prior to the visit and their desire for antibiotic prescriptions on physicians' prescription of antibiotics in the visits, and (4) identify the

main predictors of caregivers' use of non-prescribed antibiotics and their desires for overall antibiotic treatment and IV antibiotic prescriptions in particular.

## **2.2 Data and Methods**

To investigate these research questions, a cross-sectional survey was conducted in China between October and November 2013. A 13-item questionnaire was developed regarding caregivers' behaviors and attitudes in managing their child's common cold symptoms. The University of California, Los Angeles (UCLA) Institutional Review Board (IRB) approved all study procedures for the duration of the study. No identifiable information was involved in the study.

### *2.2.1 Inclusion Criteria*

To be eligible for participation, caregivers must (1) have a child between 3 to 10 years old; (2) have brought their child to at least one medical visit for his or her upper respiratory infection symptoms (cough, fever, nasal congestion, etc.) in the past 6 months; (3) provide informed consent to participate in the study; and (4) be able to read and write.

### *2.2.2 Sampling Method and Survey Administration*

A purposive sampling method was used. Caregivers who were eligible to participate in the study were recruited through kindergartens and primary schools in 34 sites in 21 provinces across the country during the data collection period. Based on the administrative classification of these sites, the sample was sorted into tier-1, tier-2, tier-3 cities as three separate strata and tier-4 rural areas as a separate stratum. Almost equal proportions of the sample were from tier-1 (22%), tier-2 (21%) urban areas, tier-4 rural areas (22%), and the proportion of samples in the tier-3 urban areas was slightly higher (35%). A total of 3,343 eligible caregivers participated in the survey; 287 samples

were excluded because of missing values in related variables; a total of 3,056 samples were included for analysis. Note that while the sample is not generalizable to the national population, it is roughly representative of the four tiers of geographical areas varying in their level of economic, political and cultural development based on the administrative classification.

### 2.2.3 *Survey Instrument*

The survey was a self-administered, 13-item questionnaire pertaining to children's most recent medical visits to physicians for common cold symptoms. The survey addressed three main aspects: (1) self-medication behavior before the visit, (2) caregivers' desire for antibiotic prescriptions in the visit, and (3) prescriptions received from the physician. Visit-related information was also collected, such as visit type (acute vs. follow-up) and symptoms for the visit. In addition, respondents' socio-demographic characteristics were also assessed, including caregiver age, gender, educational attainment, residence place, as well as child age. A sample of the questionnaire and a translated version are included in the Appendix (see Appendix 1 and 2).

The questionnaire was written in Chinese and was pre-tested based on a pilot study in terms of its readability and accessibility to target participants. During the test period, it was found that participants frequently failed to differentiate Chinese anti-inflammatory medicine from western antibiotics because these two types of medicine share a same vernacular name (*xiaoyan yao*). To address this problem, I included Chinese anti-inflammatory medicine (*zhongyao xiaoyan yao*) and western antibiotics (*xiyao xiaoyan yao*) as two separate categories in the related responses, despite that Chinese anti-inflammatory medicine is not mutually exclusive with non-antibiotic medicine as a third category.

#### 2.2.4 *Statistical Analysis and Variable Construction*

Data were entered with EpiData (Version 3.1.0) and were analyzed with R (Version 0.99.467). Descriptive analyses were conducted with all variables to obtain an overview of respondent socio-demographic characteristics, visit-related characteristics, self-medication prior to the visit, desire for medical service or prescriptions in the visit, and prescriptions received from physicians. Numerical variables such as child age and caregiver age were measured with means and standard deviations. Categorical variables such as caregiver sex, education, and residence place were measured with frequency distribution and percentage.

In addition, type of medications that caregivers used before the visit, service or prescriptions that they desired to receive from the physicians (e.g., informing about diagnosis, IV drip antibiotic prescriptions, etc.), and the prescriptions that they received from the physicians (e.g., oral antibiotics, IV drip antibiotics, etc.) were measured with frequency distribution and percentage by each subcategory, as respondents could check any number of these subcategories in the survey. Based on this information, *numerical variables* were created to reflect number of symptoms that the respondent presented, and number of caregiver desires for medical service or prescriptions.

Data were also recoded to include new *binary variables* to indicate (1) whether the respondent used non-prescribed antibiotics; (2) whether the respondent reported desires for antibiotic prescriptions; (3) whether the respondent reported receiving antibiotic prescriptions. All recoding of the variables were documented in a R script and a log file.

To examine the effect of caregivers' desire for antibiotic prescriptions on prescribing outcomes, I estimated a multiple logistic regression model to test the association between the two variables. Whether the respondent reported desires for antibiotic prescriptions (1=yes, 0=no) was treated as the independent variable, and whether the respondent reported receiving antibiotic prescriptions (1=yes, 0=no) was treated as the dependent variable; in addition, the set of caregivers'

socio-demographic characteristics and a list of visit-related characteristics were treated as confounding variables and were controlled for in the regression analysis.

To investigate the relationship among caregiver pre-visit self-medication behavior, their desires for prescriptions in the visit, and prescriptions that they received from physicians, I hypothesized that there was a casual mediation relationship among the three variables. Causal mediation analysis was conducted to test the role of caregivers' desires for IV antibiotic prescriptions in mediating the relationship between caregiver use of non-prescribed oral antibiotics before the visit and them receiving IV drip antibiotic prescriptions in the visit.

To identify the predictors of caregivers' use of non-prescribed antibiotics before the visit, as well as that of caregivers' desires for antibiotic prescriptions and IV antibiotic prescriptions in the visit, I estimated multiple logistic regression models. (1) Caregiver use of non-prescribed antibiotics before the visit, (2) caregivers' desires for antibiotic prescriptions, and (3) caregiver desires for IV drip antibiotic prescriptions were treated as dependent variables in the three regression models, respectively. Independent variables include socio-demographic characteristics of the patients and caregivers, visit-related characteristics such as type of visit, number of symptoms presented, number of desires reported in each of the three models; caregiver use of non-prescribed antibiotics before the medical visit was included as an additional independent variable in the two regression models for caregivers' desire for antibiotic prescriptions and caregivers' desire for IV drip antibiotic prescriptions, respectively.

## **2.3 Results**

### *2.3.1 Socio-demographic Characteristics of Participants*

The mean age of the caregivers was 35 years (SD = 6.7) and the range was 20 to 81 years (Table 2-1). The mean age of their child was 7 years (SD = 1.79) and the range was 3 to 10 years.

Approximately 67% of the sample were female. Less than 24% of the sample had been educated at college level or beyond, 46% completed high school or obtained associated degree, and another 31% had middle school education or lower. Approximately the same proportion of the sample were from Tier-1 (22%), Tier-2 urban areas (21%) and Tier-4 rural areas (22%), while a slightly higher proportion of the sample were from Tier-3 urban areas (35%).

**Table 2-1.**  
**Socio-demographic Characteristics of Respondents (N=3,056)**

	<b>Mean</b>	<b>SD</b>
<b>Child Age</b>	7	1.8
<b>Caregiver Age</b>	35	6.7
	<b>Frequency</b>	<b>Percent</b>
<b>Caregiver Gender</b>		
Female	1959	67%
Male	986	33%
<b>Caregiver Education</b>		
Middle School Degree or Lower	908	31%
High School or Associate Degree	1376	46%
College Degree or Above	678	23%
<b>Residence Place</b>		
Tier 1	659	22%
Tier 2	652	21%
Tier 3	1078	35%
Tier 4 (Rural)	667	22%

### 2.3.2 Characteristics of Medical Visits

For their most recent medical visits to physicians regarding their child's common cold symptoms, 73% were for new acute conditions (Table 2-2). Three most common symptoms that were presented to the physicians were cough (51%), runny nose (49%), and fever (33%). The mean number of symptoms presented by the caregivers was 2 (SD = 1.2), ranging from 1 to 8. This result indicates that the child of the caregivers in the sample were not sicker than those in similar settings in the US pediatrics (Mangione-Smith, Elliott, Stivers, McDonald, Heritage, McGlynn, 2004).

**Table 2-2.**  
**Visit-related Characteristics (N=3,056)**

	Frequency	Percent
<b>Visit Type</b>		
Acute	2067	68%
Follow-up	989	32%
<b>Symptom</b>		
Cough	1551	51%
Runny nose	1501	49%
Fever	1022	33%
Sore throat	865	28%
Bad appetite	652	21%
Stomachache	419	14%
Vomit	230	8%
Wheezing	123	4%
Other symptom	63	2%
	<b>Mean</b>	<b>SD</b>
<b>Number of Symptom</b>	2	1.2

### 2.3.3 *Self-medication Before the Visit*

Prior to their most recent medical visit to physicians, approximately 74% of the respondents reported that they had self-medicated their child with medications for managing upper respiratory infection symptoms (Table 2-3). Among those who had self-medicated their child with medications before visit, more than half of them had used non-prescribed oral antibiotics (51%), accounting for 38% of the total respondents; the rest used non-antibiotic medications such as Chinese anti-inflammatory medications or other OTC symptom medicine, accounting for 36% of the total respondents. Another 26% reported no usage of any medications before their visit. This indicates that (1) self-medication for child upper respiratory infection symptoms was common; and (2) use of antibiotics (especially non-prescribed antibiotics) was much more common than many countries, given the prescription-only status of the antibiotics.

**Table 2-3.**  
**Self-medication Before the Visit (N=3,020)**

	<b>Frequency</b>	<b>Percentage</b>
Use of Antibiotic Medications	1161	38%
Use of Non-Antibiotic Medications	1085	36%
Not Use Any Medications	774	26%

\*Missing data were deleted listwise.

#### 2.3.4 Caregiver Desires for the Medical Visit

A total of 74% (n=2,224) of the respondents reported having desire of some kind when they brought their child to visit physicians. Among them, the most common four types of desires are unrelated to medications, including informing about diagnosis (51%), informing about causes of illness (52%), and informing about management method of the child’s symptoms (51%), as well as having physical exams by the physician (51%) (Table 2-4).

Among those who reported desires of some kind of prescriptions from the physician, the three most common types of prescriptions were oral Chinese anti-inflammatory medicine (23%), IV drip antibiotic prescriptions (20%), and oral antibiotic prescriptions (18%); in contrast, only 12% of them reported desires for oral non-antibiotic medicine (excluding the anti-inflammatory medicine). This indicates that antibiotic prescriptions as a group are most favored by the caregivers; and in particular, between the two modalities of antibiotic prescriptions, IV drip antibiotics are preferred over oral antibiotics.

**Table 2-4.**  
**Caregiver Desires for the Visit (N=3,004)**

	<b>Frequency</b>	<b>Percentage</b>
Informing about Diagnosis	1598	53%
Informing about Cause of Illness	1573	52%
Informing about Management Methods	1524	51%
Conducting Physical Exam	1523	51%



No Particular Desires/Following Physicians' Recommendations	780	26%
Oral Chinese Anti-inflammatory Prescriptions	509	17%
IV Drip Antibiotic Prescriptions	447	15%
Oral Antibiotic Prescriptions	400	13%
Oral Non-Antibiotic Prescriptions	276	9%
IV Non-Antibiotic Prescriptions	57	2%
Other Type of Desires	22	1%
	<b>Mean</b>	<b>SD</b>
<b>Number of Reported Desires</b>	2.9	1.63

\*Missing data were deleted listwise.

†Caregivers could check any number of these items in the survey.

### 2.3.5 Prescribing Decision Outcomes of the Medical Visit

Table 2-5 shows that 70% of the respondents reported that they had received antibiotic prescriptions from their physicians; among them, 43% of them received IV drip antibiotics. This indicates that the proportions of the caregivers receiving antibiotic prescriptions from their physicians are high and the uses of antibiotics that are administrated through IV drip infusions are prevalent.

**Table 2-5.**  
**Prescribing Decisions (N=2,939)**

	<b>Frequency</b>	<b>Percentage</b>
<b>Antibiotic</b>	<b>2069</b>	<b>70%</b>
IV Drip Antibiotics	883	43%
Oral Antibiotic Medications	1186	57%
<b>Non-Antibiotic</b>	<b>870</b>	<b>30%</b>
Oral Chinese Anti-inflammatory Medications	512	59%
Other Non-Antibiotic Medications	358	41%

\*Missing data were deleted listwise.

### 2.3.6 *Effect of Caregiver Desires for Antibiotic Prescriptions on Prescribing Decision Outcomes*

This part of the analyses aims to test the relationship between caregivers' desires for antibiotic prescriptions as the independent variable and physicians' prescribing outcomes as the dependent variable. Child age, caregiver age, gender, educational attainment, residence place, type of visit, number of symptoms presented at the visit, and number of caregiver self-report desire for the visit were treated as confounding variables. After controlling for these confounding variables, results of the multiple logistic regressions revealed that caregivers' desires for antibiotic prescriptions were significantly associated with them receiving physicians' antibiotic prescriptions (see Table 2-6). In addition, child age, caregiver age, number of symptoms presented at the visit, as well as number of caregiver desire for the visit were also found significantly associated with the dependent variable.

Controlling for all other variables, caregivers who reported having desire for antibiotic prescriptions were 24.3% more likely to receive antibiotic prescriptions, compared to those who did not report such desire. Caregivers being younger, with an older child, paying a follow-up visit, presenting more symptoms, and reported more desires for the visit were significantly more likely to receive antibiotic prescriptions from their physicians than those otherwise. However, caregiver gender, educational attainment, and residence place were not significant.

**Table 2-6.**  
**Effect of Caregiver Desires for Antibiotic Prescriptions on Antibiotic Prescriptions (N=3,056)**

<b>Variable</b>	<b>Odds Ratio</b>	<b>95% CI</b>	<b>P-Value</b>
Caregiver Desires for Antibiotic Prescriptions	1.243	1.191-1.297	<0.0001 ***
Visit Type	0.949	0.914-0.985	0.006 **
Child Age	1.015	1.004-1.026	0.006 **
Caregiver Age	0.995	0.992-0.998	0.000 ***
Caregiver Sex	0.991	0.955-1.029	0.652
Caregiver Education			
Middle School Degree or Lower	Reference		
High School	0.991	0.946-1.038	0.700
Association Degree	1.043	0.989-1.101	0.121
College Degree	1.014	0.960-1.072	0.609

Master Degree or Above	1.000	0.915-1.093	0.998	
Residence Place				
Tier 1	Reference			
Tier 2	1.031	0.977-1.089	0.262	
Tier 3	1.011	0.964-1.061	0.646	
Tier 4 (Rural)	0.999	0.946-1.055	0.971	
Number of Symptoms	1.041	1.025-1.058	<0.0001	***
Number of Desires	1.022	1.010-1.034	<0.001	***

Note: Significant at 0.05 level.

### 2.3.7 Caregiver Desires as A Mediator

This part of the analyses aims to examine the role of caregivers' desires for IV drip antibiotic prescriptions in mediating the relationship between caregivers' use of non-prescribed oral antibiotics before the medical visit as the independent variable and caregiver receiving IV drip antibiotic prescriptions in the visit as the dependent variable.

Mediation analysis was guided by Baron and Kenny (1986) and Tingley, Yamamoto, Hirose, et al., (2014). Baron and Kenny (1986) pointed out that the mediator function of a third variable “represents the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest” (p1173); in addition, “mediators explain how external physical events take on internal psychological significance” (p1176). This thus applies to my hypothesis that caregivers' desires for IV drip antibiotics are caused by them using non-prescribed oral antibiotics before the visit, and their desires in turn cause physicians' higher likelihood of inappropriate prescriptions of IV drip antibiotics.

Specifically, for mediation to occur, the independent variable (X) must affect both the dependent variable (Y) and the proposed mediator variable (M), and the effect of the independent variable (X) must diminish when the mediating variable (M) is controlled. Figure 2-1 illustrates the indirect effects (path a + path b) and direct effects (path c) on the dependent outcome variable.

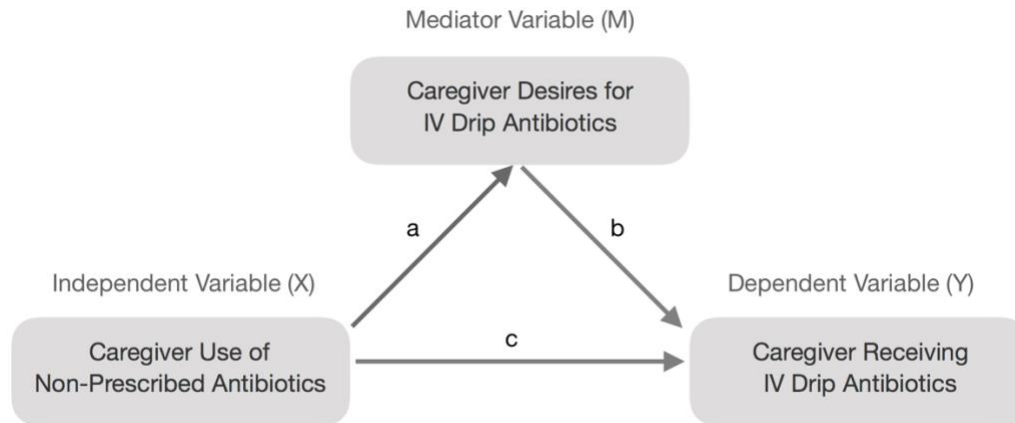


Figure 2-1. The indirect and direct effects of X and M on Y.

Results from the causal mediation analysis (Tingley, Yamamoto, Hirose, et al., 2014) revealed that while the indirect effects (ACME = 0.033,  $p < 0.01$ ) and the total effects (Total Effect = 0.068,  $p < 0.01$ ) on the outcomes were still significant, the direct effects are no longer significant (ADE = 0.035,  $p = 0.06$ ) after controlling for the independent variable (X) and the mediator variable (M). This indicates that caregivers' desires for IV antibiotic prescriptions indeed mediates the relationship between them using non-prescribed oral antibiotics before the visit and them receiving IV drip antibiotic prescriptions from the physicians in the visit. In other words, caregivers' who had used non-prescribed oral antibiotics were more likely to report desires for IV drip antibiotic prescriptions in their medical visit to physicians, and them reporting desires for IV drip antibiotic prescriptions significantly increased the likelihood of receiving IV drip antibiotic prescriptions from their physicians.

A similar casual mediation analysis was conducted to examine the role of caregivers' desires for overall antibiotic prescriptions (M) in mediating the relationship between caregivers use of non-prescribed oral antibiotics before the visit as the independent variable (X) and them receiving overall antibiotic prescriptions in the visit as the dependent variable (Y). The results revealed that although the indirect effects were significant (ACME = 0.032,  $p < 0.01$ ), the direct effects (ADE = 0.228) and

the total effects (Total Effect = 0.261) were not significant. This indicates that caregivers' general desire for antibiotics have a less important effect on physicians' overall antibiotic prescriptions, compared to that of their desire for IV drip antibiotics on physicians' prescription of IV drip antibiotics.

### 2.3.8 *Determinants of Caregivers Use of Non-Prescribed Antibiotics before Medical Visits*

This part of the analysis aims to investigate the predictors of caregiver use of non-prescribed oral antibiotics prior to the visit. Since the sample included both acute visits and follow-up visits, I restricted this part of analysis to caregiver acute visits for their child's new conditions. The dependent variable is a binary variable indicating whether the respondent reported having used oral antibiotics before the visit; the independent variables include all the socio-demographic variables listed in Table 1. Multiple regression results revealed that child age, caregiver age, caregiver educational attainment, residence place, as well as number of symptoms reported are all significantly associated with caregiver use of non-prescribed antibiotics before the medical visit (see Table 2-7). Specifically, caregivers who have an older child, having lower educational attainment, living in lower tier areas, and reporting more symptoms were significantly more likely to use non-prescribed antibiotics before the medical visit.

**Table 2-7.**  
**Predictors of Caregiver Use of Non-Prescribed Antibiotics Before Medical Visits (N=3,056)**

<b>Variable</b>	<b>Odds Ratio</b>	<b>95% CI</b>	<b>P-Value</b>
Child Age	1.016	1.005-1.027	0.007 **
Caregiver Age	0.997	0.994-1.000	0.082
Caregiver Sex	1.011	0.972-1.052	0.257
Caregiver Education			
Middle School Degree or Lower	Reference		
High School or Associate Degree	0.926	0.886-0.968	0.001 ***
College Degree or Above	0.861	0.815-0.908	<0.0001 ***
Residence Place			

Tier 1	Reference			
Tier 2	1.119	1.058-1.184	<0.001	***
Tier 3	1.072	1.020-1.128	0.002	**
Tier 4 (Rural)	1.130	1.066-1.197	<0.001	***
Number of Symptoms	1.045	1.029-1.061	<0.0001	***

Note: Significant at 0.05 level.

### 2.3.9 Predictors of Caregiver Desire for Antibiotic Prescriptions

This part of the analysis aims to explore the predictors of caregivers' desires for antibiotic prescriptions. Dependent variable is a binary variable indicating whether the respondent reported any desire for antibiotic prescriptions in general (1=yes, 0=no); a series of socio-demographic variables as well as some visit-related characteristics were treated as independent variables. Multiple logistic regression model results are illustrated in Table 2-8.

The results revealed that child age, caregiver gender, caregiver educational attainment, residence place, type of visit, number of symptoms presented, number of desires reported, as well as whether caregiver had used antibiotics before the visit were all significantly associated with caregivers' desires for antibiotic prescriptions; whereas caregiver age was not.

Specifically, caregivers with older children, being male, with lower educational attainment were more likely to report desires for antibiotic prescriptions; compared to those residing in tier-1 urban areas, caregivers living in tier-2, tier-3 urban areas and tier-4 rural areas were all more likely to report desires for antibiotics. In addition, caregivers who were paying a follow-up visit, presenting more symptoms, and reporting higher number of desires were also more likely to report desires for antibiotics. Furthermore, caregivers who had used antibiotics prior to the medical visit were also significantly more likely to report desires for antibiotic prescriptions.

**Table 2-8.**  
**Predictors of Caregiver Desires for Antibiotic Prescriptions (N=3,056)**

Variable	Odds Ratio	95% CI	P-Value
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Child Age	1.021	1.011-1.030	<0.0001	***
Caregiver Age	1.001	0.998-1.003	0.553	
Caregiver Sex	0.947	0.917-0.979	0.001	**
Caregiver Education				
Middle School Degree or Lower	Reference			
High School or Associate Degree	0.951	0.917-0.987	0.008	**
College Degree or Above	0.891	0.851-0.932	<0.0001	***
Residence Place				
Tier 1	Reference			
Tier 2	1.042	0.994-1.093	0.080	
Tier 3	1.178	1.130-1.229	<0.0001	***
Tier 4 (Rural)	1.070	1.017-1.120	0.008	**
Visit Type	0.937	0.907-0.969	<0.0001	***
Number of Symptoms	1.033	1.019-1.047	<0.0001	***
Number of Desires	1.050	1.040-1.061	<0.0001	***
Use of Antibiotics before the Visit	1.153	1.117-1.191	<0.0001	***

Note: Significant at 0.05 level.

### 2.3.10 Predictors of Caregiver Desires for IV drip Antibiotic Prescriptions

Given caregivers' preference for IV drip antibiotics over oral antibiotics and that their desires for IV drip antibiotics significantly affects the likelihood of them receiving actual IV drip antibiotic prescriptions, I also explored the predictors of caregivers' desires for IV drip antibiotic prescriptions. In this multiple logistic regression model, the dependent variable is a binary variable indicating whether the caregiver had reported a desire for IV drip antibiotics (1=yes, 0=no), and the independent variables are the same with those in the previous model. The results revealed a very similar finding to the previous model (Table 2-9).

**Table 2-9.**  
**Predictors of Caregiver Desires for IV Drip Antibiotic Prescriptions (N=3,056)**

Variable	Odds Ratio	95% CI	P-Value	
Child Age	1.015	1.008-1.023	0.000	***
Caregiver Age	0.999	0.997-1.001	0.299	
Caregiver Sex	0.968	0.941-0.995	0.021	**
Caregiver Education				

Middle School Degree or Lower	Reference			
High School or Associate Degree	1.005	0.974-1.037	0.740	
College Degree or Above	0.944	0.908-0.981	0.003	**
Residence Place				
Tier 1	Reference			
Tier 2	1.047	1.006-1.090	0.023	*
Tier 3	1.147	1.107-1.188	<0.0001	***
Tier 4 (Rural)	1.070	1.027-1.114	0.001	***
Visit Type	0.941	0.915-0.968	<0.0001	***
Number of Symptoms	1.035	1.023-1.047	<0.0001	***
Number of Desires	1.029	1.020-1.038	<0.0001	***
Use of Antibiotics before the Visit	1.051	1.023-1.080	0.000	***

\*Note: Significant at 0.05 level.

Similar to caregiver desire for overall antibiotic prescriptions, both older child age and caregiver male sex predict higher likelihood of caregiver desire for IV antibiotic prescriptions; however, with respect to caregiver educational attainment, only college education is associated with reduced likelihood of caregiver desire for IV antibiotics, compared to caregivers with middle school degree or lower. In addition, caregivers living in tier-2, tier-3 urban areas and tier-4 rural areas were all significantly more likely to report desire for IV antibiotics than tier-1 urban residents; while residing in tier-3 urban area is the strongest predictor. Moreover, paying a follow-up visit, presenting higher number of symptoms, reporting higher number of desire, and having used non-prescribed antibiotics before the visit were also associated with higher likelihood of caregivers' desire for IV antibiotics.

## 2.4 Discussion

Despite the scale and magnitude of antibiotic over-prescriptions in China, this problem of antibiotic over-prescription has not received the kind of extensive attention that it deserves. The existing research has overwhelmingly attributed this problem to physicians, their financial incentives, and the underlying structural problems of the healthcare system; little research has examined



demand-side factors such as self-medication and desires for antibiotic prescriptions among patients. This study thus contributes to this line of research.

#### *2.4.1 Antibiotic Prescribing and Overuse of IV Drip Antibiotics*

First of all, our findings revealed that the majority of the respondents reported having received antibiotic prescriptions in the most recent visit to physicians for their child's common cold symptoms. Moreover, among them, nearly half of the respondents reported that they have received antibiotic prescriptions that were administered through IV infusion (Table 2-5). This result thus amplifies existing findings on the high rate of antibiotic prescriptions in general and high use of IV drip antibiotics in particular.

#### *2.4.2 Caregiver Desires for Antibiotic Prescriptions and Prescribing Decision Outcomes*

To examine what contributes to antibiotic over-prescriptions, a large body of western literature has shown that patient desires are the most common reason that physicians cited for their over-prescriptions of antibiotics. In this study, the results revealed that Chinese caregivers' desires for antibiotic prescriptions are also associated with the prescriptions they received in medical visits. When caregivers reported a desire for antibiotic prescriptions, they were significantly more likely to receive an actual antibiotic prescription from their physicians (Table 8 and Table 9). This result thus supports existing findings on the demand-side contributors of antibiotic over-prescriptions in the western literature, which is quite contrary to the predominant view that antibiotic over-prescribing in China is primarily a supply-side issue.

#### 2.4.3 *Self-medication with Antibiotics, Desires for IV Antibiotics, and Prescription of IV Antibiotics*

The descriptive statistics of caregivers' self-medication behavior before the medical visit showed that a considerably large proportion of the caregivers had used non-prescribed oral antibiotics prior to the visit to manage their child's upper respiratory symptoms (Table 3). Although the overall prevalence estimate is lower than the previous findings from Bi, Tong, & Parton (2000) and Yu et al. (2014), considering that their studies were based on samples from a single rural village and two county clinics, our study provides a more generalizable estimate of the prevalence of caregivers' use of non-prescribed antibiotics based on samples from both urban and rural areas.

Furthermore, this result also indicates that despite their prescription-only status, antibiotics can be easily accessed by the caregivers and used at their own discretion. Thus, apart from over-prescription of antibiotics from the clinical settings, widespread use of non-prescribed antibiotics is also an important contributor to China's antibiotic overuse problem. Given that this practice is often associated with shorter courses of treatment than is standard, with inappropriate choices of drugs and dosage, and with masking of the underlying infectious process (Morgan et al., 2011), overuse and misuse of non-prescribed antibiotics is consequential on the rising rates of antibiotic resistance.

Moreover, the overuse and inappropriate use of non-prescribed oral antibiotics is not only problematic per se, but also consequential on physicians' over-prescriptions in the clinical setting. The causal mediation analysis results revealed that there was a causal chain among the three variables, namely, caregivers' use of non-prescribed oral antibiotics, their desires for IV drip antibiotic prescriptions, and them receiving the IV drip antibiotic prescriptions. That is, caregivers' use of oral antibiotic before the medical visit significantly increased the likelihood of them reporting a desire for IV antibiotic prescription; when they had desires for IV drip antibiotics, it further increased the likelihood of them receiving an IV antibiotic prescription from physicians in the visit. This finding thus highlighted a mechanism through which physicians' over-prescription of IV drip

antibiotics in medical visits are linked through caregivers' desires for the prescriptions to caregivers' use of non-prescribed oral antibiotics prior to the medical visit.

#### *2.4.4 Risk Factors and Implications for Intervention Programs*

Besides identifying the demand-side contributors of antibiotic over-prescription in Chinese pediatric setting, this study also explored the potential predictors of caregivers' use of non-prescribed antibiotics for child's upper respiratory infection symptoms, and that of caregivers' desires for antibiotic and IV drip antibiotic prescriptions. The result showed that aligned with the previous finding, older child age also predicts higher likelihood of self-medication with non-prescribed antibiotics; in addition, it also revealed that caregivers having particular characteristics (i.e. with lower educational attainment, living in lower-tier areas, presenting higher number of child's symptoms) were more prone to the risky behavior of using non-prescribed antibiotics prior to medical visits, and of having desires for antibiotic prescriptions and IV drip antibiotic prescriptions. Intervention programs targeting these key population groups are likely to achieve better outcomes in reducing inappropriate prescription rates and caregivers' use of non-prescribed antibiotics.

Taken together these findings suggest that a greater focus on reducing and blocking demand-side pressures to prescribe may usefully contribute to the reduction of inappropriate prescribing in the Chinese context.

## Chapter 3

### Caregiver Advocacy for Antibiotic Treatment in Pediatric Interaction

#### 3.1 Introduction

To answer the research question – to what extent is antibiotic over-prescription driven by demand-side factors? – I first examined the effects of caregivers' self-report pre-visit self-medication behavior and desire for antibiotic prescriptions on physicians' antibiotic prescriptions for their children's respiratory tract infection symptoms (Chapter 2). Some questions remain unanswered because of the features and limitations of the survey methodology. For example, given that caregivers' self-reported desire is associated with physicians' antibiotic prescriptions, (1) Do caregivers communicate their desire for antibiotic prescriptions to physicians in medical interactions? (2) How do they communicate their desire for antibiotic treatment? (3) Do they orient to antibiotic treatment as something that they are entirely entitled to advocate for in line with their desires, or do they defer to physicians' medical authority over treatment decisions? (4) Do caregivers' advocating actions have an effect on the prescribing outcomes? Answering these questions is important for better understanding the process through which over-prescription of antibiotics is enacted in medical interaction, and for devising effective interventions to reduce over-prescription.

Motivated by these questions, in this chapter, I investigate physician-caregiver conversation and particularly caregivers' overt advocating actions for antibiotic treatment. I will show that 1) Chinese caregivers do communicate their desire for antibiotic treatment to physicians, and their treatment advocacy is not only more overt but also more frequent than that of their American counterparts; (2) to advocate for antibiotic treatment, Chinese caregivers primarily rely on four types of actions which vary in their degree of overtness, entitlement (Curl and Drew 2008) and imposition on physician's actions; (3) by producing the overt advocating actions, on the one hand, caregivers

display a high level of agency and entitlement; while on the other hand, they still defer to physicians' medical authority in antibiotic treatment decisions; and (4) statistical test results reveal that caregivers' advocating actions significantly affect prescribing outcomes. Based on these findings, I thus conclude that caregivers frequently communicate their desire and pressure physicians for prescribing, and the high prevalence of antibiotic over-prescription in China is significantly influenced by demand-side factors, i.e., caregivers' demand and pressure in medical consultations.

### *3.1.1 Background*

Research from the US and UK has shown that antibiotic over-prescription is associated with patient desires and expectations (Britten & Ukoumunne, 1997; Choi, Park, Lee, & Kwon, 2012; Linder & Singer, 2003, Macfarlane, Holmes, Macfarlane, & Britten, 1997). Yet, more in-depth research argues that it is physicians' perceptions of parental expectations for antibiotic treatment, rather than actual parental expectations, that are associated with physicians' over-prescription (Mangione-Smith, Elliott, Stivers, McDonald, & Heritage, 2006; Mangione-Smith, McGlynn, Elliott, Krogstad, & Brook, 1999).

This stream of research highlights the crucial role of physician-patient/parent interaction in antibiotic over-prescription. That is, even when parents do not report an expectation for antibiotics, if physicians infer that parents are expecting antibiotics, they are significantly more likely to prescribe inappropriately (Mangione-Smith et al., 1999). Therefore, antibiotic over-prescription can be interactionally generated (Britten, 2001; Mangione-Smith et al., 2015; Stivers, 2002a, 2005, 2006, 2007; Stivers, Mangione-Smith, Elliott, McDonald, & Heritage, 2003a), independent of physicians' professional judgments of patients' medical conditions.

Following this line of research, I look at caregivers' advocating actions as a second way in which to address potential demand-side factors influencing antibiotic over-prescription in China. At

its core, the advocating actions can be understood as recruitment-like actions (Drew & Couper-Kuhlen, 2014; Kendrick and Drew 2016); that is, by producing such actions, the speaker attempts to enlist someone's assistance, typically with respect to an immediate physical need, problem or wish, and generates implications of need, of obligation, of imposition and constraint (Drew & Couper-Kuhlen, 2014). I first review existing findings regarding: (1) requesting as a social action more generally, and (2) advocating actions for antibiotic treatment in medical interaction.

### 3.1.1.1 Requesting as a social action

Requesting is one of the most basic and ubiquitous activities in social interaction. Its significance as a social action is reviewed by Drew & Couper-Kuhlen (2014) and can be summarized as having three components. First, we do requesting very often in daily life – whoever we are and wherever we live, whatever language we speak, whatever work we do, whatever our “position” in society. Second, requesting lies at the very heart of cooperation and collaboration in our social lives and has a particular significance for our interaction, relationships, and associations with one another – through requesting we seek the help of others in doing or managing things that we could not do, or could not so easily do, or would prefer not to do by ourselves (Drew & Couper-Kuhlen, 2014; Heritage, 2016; Rossi, 2015). Third, requesting is a delicate matter – when we make requests, we inherently, but usually implicitly, convey that we need of something; we expose ourselves to be seen to be wanting in some fashion. Moreover, we place some kind of *obligation* on the requestee, one that might require a degree of *imposition* or even sacrifice, some risks to the requester of being turned down or acquiring a reciprocal obligation. As a social action, requesting thus carries with it implications of need, of obligation, of imposition and constraint, and is a core feature of the management of social cohesion and social solidarity in social interaction (Drew & Couper-Kuhlen, 2014, p2).

In general, studies of requesting have been concerned with how to map actions onto linguistic expressions (Drew & Couper-Kuhlen, 2014), in other words, the selection of requesting forms and the principles behind people's selections (Rossi, 2015). Despite the large body of literature on this research enquiry, it has mostly been approached from perspectives in psychology (Ervin-Tripp, 1981), language philosophy - speech act theory, and pragmatics - politeness theory (Brown & Levinson, 1987).

Until recently, researchers on conversation and talk-in-interaction have focused on requesting as a social action. Two central issues being discussed are (1) In what context do speakers design requests in which ways?, and (2) How does a recipient come to understand a particular linguistic form as implementing a request? (Drew & Couper-Kuhlen, 2014, p13). Drew & Couper-Kuhlen (2014) further stated that the most prominent principles to emerge from the discussion in the current literature as relevant for the use of a specific request form include: 1) sequential environment, 2) entitlement, and 3) contingency.

*Sequential environment* is concerned with speakers' understanding of what is going on in the current sequence and/or what has gone in a prior sequence or sequences. For example, Wootton (1997) analyzed the requesting behavior of a young English-speaking child and found that the child's selection of request forms was sensitive to, and reflexively indicative of, understandings of the interactional context, e.g., whether the request was projectably out of line with what the recipient appeared to be envisaging. Similarly, Rossi (2012) identified a functional distinction between imperative and interrogative constructions of requests based on a corpus of naturally occurring Italian interactions – the imperative format was selected to implement 'bilateral requests' (in which the requested actions are integral to an already established joint project between the requester and recipient); whereas the interrogative format was a vehicle for 'unilateral requests' (in which the

requested actions seek to enlist help in new, self-contained projects that are launched in the interest of the speaker as an individual).

*Entitlement* (Curl & Drew, 2008) is concerned with speakers' understandings of whether they have a right to request a particular object or course of action. For instance, Lindström (2005) found that speakers' selection of two requesting forms (i.e. imperatives and interrogatives) depended on their understanding of whether they were entitled to make the request in the context of the Swedish home help services for senior citizens – imperative constructions displayed the requesters' entitlement; whereas the interrogatives indicated otherwise. Similarly, Heinemann (2006) in a similar institutional setting in Denmark also found requesters' using the requesting format “*Can't you X?*” displayed their entitlement to make the request, as compared to the use of the other form “*Will you X?*”

*Contingency* is concerned with speakers' awareness or orientation to factors that could compromise the grantability of a request (Drew & Couper-Kuhlen, 2014). Curl and Drew (2008) in their study found that in addition to entitlement, speakers' use of requesting forms (e.g. *Can/could you...?* and *I wonder if...?*) was also affected by contingency. Specifically, the form *I wonder if...?* usually prefaces the requested action that is construed as something that is only possibly an option, due to factors that cannot be anticipated in advance – ‘high contingency’ requests; whereas the modal construction *Can/Could you...?* displays speakers' orientation to fewer contingencies that might affect the grantability of the request – ‘low contingency’ requests.

In this chapter, I show that these principles are also manifested in the turn design of the caregivers' overt advocating actions; the use and production of the caregivers' advocating actions display their understanding of the *sequential environment*, *entitlement*, and *contingency* associated with the advocating actions, displaying the caregivers' orientation toward the overt advocating actions as delicate, imposing, if not socially dispreferred actions in the social interactions.



This is not to say that speakers' understandings of their *sequential environment, entitlement* and *contingency* within the local organization of the interaction are independent of their understanding of their social identity and relationships that are external to the interactional process. The asymmetrical relationship between physicians and patients (and their caregivers) is part of the nature of medical interaction – patients are traditionally considered to have the rights and obligations to seek medical assistance from physicians (Parsons, 1951), whereas physicians are considered professionals with both the cultural and social authority to affect patients – not only in their interpretation of the health conditions (i.e., diagnosis), but also their actions to manage the conditions (i.e., treatment), even in modern medicine (Abbott, 1988; Freidson, 1988; Parsons, 1951; Starr, 1982). However, after holding constant the social relationship variable by looking at advocating actions in this particular setting of pediatric interaction<sup>2</sup>, the fact that caregivers still use different action formats to advocate for antibiotic treatment shows that their use of action format is driven by mechanisms that exist at a local micro level. Answering the question of when caregivers choose different formats of overt advocating actions is a side project of this chapter.

The above review provides a summary of current research on requesting as a delicate and imposing social action in general. Next, I briefly review the current findings on caregiver advocating actions in the context of medical consultations, and particularly, Stivers' (2000, 2002b, 2002a, 2005, 2006, 2007) series of research papers on parent advocating actions for antibiotic treatment in American pediatric acute visits.

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<sup>2</sup> This is compared to interaction in ordinary setting, in which participants' social relationships can be complicated, rather than dominated by specific institutional roles.

### 3.1.1.2 Advocating actions in medical interaction

It is observed that to advocate for antibiotic treatment, American parents primarily rely on covert interactional actions to communicate their desire for or expectation of antibiotic prescriptions in the pediatric encounters. These covert advocating actions include *candidate diagnosis*, *diagnosis resistance*, and *passive treatment resistance*. These behaviors have all been shown to be treated by clinicians as a form of pressure for antibiotic prescribing through qualitative analysis. For example:

*Offering a candidate diagnosis* is one of the two main ways that parents present their child's problems. Stivers (2002b) argues that when the child's problem is presented with a candidate diagnosis, parents are treated as having adopted the stance that they are seeking confirmation of their diagnosis and seeking treatment for the illness condition; whereas when the child's problem is presented with a symptoms-only description, parents are treated as primarily seeking a medical evaluation of the child. Compared to symptoms-only problem presentations, candidate diagnoses were much less frequent – 26% in pediatric encounters; however, when they are used, they are overwhelmingly used to hypothesize bacterial diagnoses, for which antibiotics are a relevant treatment (Stivers, 2007). Although candidate diagnoses do not overtly ask for antibiotics, they constitute a resource through which parents shape physicians' views of the problem and thus influence the treatment decision early in the consultation. Moreover, statistical evidence has revealed that when caregivers used a candidate diagnosis, physicians were five times more likely to perceive caregivers as expecting antibiotic prescriptions (Mangione-Smith et al., 2015; Stivers, Mangione-Smith, Elliott, McDonald, & Heritage, 2003b).

*Mentioning additional symptoms* and *mentioning possible diagnoses* are two interactional resources through which parents influence physicians' views of the patient's condition in response to history-taking questions and thus can effectively negotiate treatment decision (Stivers, 2007). First, *mentioning additional problematic symptoms* works to steer physicians away from a no-problem diagnosis by 1)

pushing the physicians towards an alternative diagnostic path by introducing a new dimension of the illness, and 2) inviting the physicians' pursuit and sequence expansion that would move the trajectory in a different direction. Second, *mentioning alternative possible diagnoses* are typically used when the physicians' series of history-taking questions involve or implicate a "no-problem" answer. By proposing alternative diagnoses, parents work to push the physicians toward a conceptualization of the illness that is at odds with the prior line of questioning. The two covert pressuring practices are not frequently used in the American dataset – 12% and 9% respectively; however, they are consistently treated by physicians as indexing a desire for antibiotics (Stivers, 2000, 2007).

*Diagnosis resistance* generally involves calling into question or disaffiliating with the physician's diagnostic evaluation and thus obstructing the progress of the visit to the next activity – treatment recommendation (Stivers, 2007; Stivers et al., 2003b). It is often accomplished with three sorts of sequence-initiating actions: 'newsmarks' (Heritage, 1984; Jefferson, 1981), 'questions about symptoms', and 'questions about the diagnosis'. Specifically, 'newsmarks' (e.g. "Really?" and "It is?") represent the least strong way of resisting, as they merely seek physicians' reconfirmation and thus promote further informings; 'questioning an examination finding' is a stronger way of resisting<sup>3</sup>; as it explicitly identifies a problem area of the diagnosis and thus projects a challenge to the physician's professional authority; 'questioning about the diagnosis' is the strongest way of resisting because it questions physicians' medical evaluation of the child's condition: a domain over which the physician is normally treated as having sole responsibility and epistemic ownership (Heath, 1992; Peräkylä, 2006). Resistance to diagnosis is comparatively rare – 17% of the dataset (Stivers, 2007); if it occurs, it has to be explicit because doctors generally do not orient to the need for affirmation of their diagnoses by patients (Stivers et al., 2017). Moreover, as Peräkylä (2006) observes, when diagnosis

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resistance is produced, it is produced in a “cautious manner”, and speakers orient to the doctor’s authority in the medical domain.

*Treatment resistance* is another parent resource to negotiate antibiotic treatment in the treatment stage (Stivers, 2005, 2007). The other covert practices reviewed above are not directly linked to treatment; however, treatment resistance can directly affect the treatment decision by turning the decision into an explicit negotiation. Specifically, since parents and physicians orient to treatment recommendations as proposals that normatively require parent acceptance, a parent withholding of acceptance of a treatment recommendation is treated as a resisting action – ‘passive treatment resistance’ (Heritage & Sefi, 1992); and if physicians do not alter their treatment recommendation in the face of passive treatment resistance, parents routinely shift to ‘active treatment resistance’, which involves actions that challenge physicians’ treatment recommendations (e.g., an alternative treatment proposal) (Stivers, 2005) – active treatment resistance occurs in 19% of the American data set (Stivers, 2007).

In sum, these covert advocating actions are the primary resources that American parents rely on to communicate their desire for and expectations of antibiotic prescriptions. Apart from the aforementioned covert advocating actions for antibiotic prescriptions, Stivers (2002a) also identified four types of overt actions that American parents very infrequently use to advocate for antibiotics, including (1) *direct requests for antibiotic treatment*; (2) *statements of desire for antibiotic treatment*; (3) *inquiries about antibiotic treatment*; and (4) *mentions of past experience with antibiotic treatment*. These overt advocating actions will be described and discussed in greater detail in the results section, where I show that Chinese caregivers are deploying very similar resources, but much more frequently, to advocate for antibiotic treatment in their encounters.

Since our preliminary observations found that Chinese caregivers tend to use overt advocating actions much more frequently than their American counterparts, in this chapter, my

focus is on caregivers' overt advocating actions that are recurrently understood by physicians as pressure for antibiotic prescriptions.

### 3.1.1.3 Roadmap

In the following sections, I first introduce the *data and methods* that I use to investigate Chinese caregivers' overt advocating actions; I then present my *findings* with respect to what they are, how frequently they occur, what they are used for, what do they reveal about caregivers' orientations to their rights and deference to physicians' authority, and what implications they have for antibiotic over-prescription. Based on the findings, I then draw *conclusions* with respect to doctor-patient relationship in this social and institutional setting and discuss their implications for antibiotic over-prescription more generally.

## **3.2 Data & Methods**

In this section, I first describe the source and characteristics of the data that I use to investigate the research problem; I then describe the methodology that I use to answer my research questions.

### *3.2.1 Data*

In total, I collected 318 video-recorded pediatric encounters for children's respiratory tract infection conditions between October and December 2013. The dataset involves 318 patients with their caregivers, 9 physicians (8 female, 1 male), and 6 hospitals at 3 tiers of urban areas in China, Among them, 196 are acute visits, in which the patient has not been seen previously by the physician for the primary condition under consultation. For the purpose of comparing my findings to those in

similar setting in the US, in this chapter, I restrict my analyses to the acute visits only. Among them, 9 visits were excluded for analysis because of incompleteness or inaudible utterances in the target turns at talk. This results in 187 acute pediatric visits for analysis.

### 3.2.2 *Methods*

Conversation Analysis is used to identify caregivers' overt advocating actions in the eligible pediatric visits. Based on findings from the conversation analytical study of the actions, I then explore the association between overt advocating actions and the prescribing outcomes. A more detailed introduction of CA as a methodology in analyzing actions in social interaction has been provided in Chapter 1.

Two types of data sets are constructed. The first involves 187 transcripts of the video-recorded naturally occurring pediatric encounters transcribed using the Jeffersonian transcribing conventions (Hepburn & Bolden, 2017; Jefferson, 2004); the second involves a coded data set, which contains 4 variables indicating (i) type of overt advocating action used, (ii) type of antibiotic treatment advocated for, (iii) type of physicians' response to the advocating actions, and (iv) type of prescribing outcome, at the visit level. In addition, the data is also recoded to include 3 additional variables, indicating (v) the number of overt advocating actions deployed, (vi) the most overt form of advocating action deployed, and (vii) the strongest type of antibiotic treatment advocated for, also at the visit level.

Next, I describe in more detail, with respect to inclusion and exclusion criteria of the target action for analysis, the taxonomy of the type of medical treatment being advocated for, as well as the prescribing outcomes.

### 3.2.2.1 Overt advocating actions: inclusion and exclusion criteria

*First, only caregivers' advocacy for antibiotic treatment is included for analysis.* Although caregivers do advocate for non-antibiotic types of prescriptions from their physicians, e.g., cough syrup, antipyretic, or Chinese anti-inflammatory medicine, such treatment advocacy is not the focus of this study and thus has been excluded from our analysis.

*Second, covert advocacy for antibiotic treatment is excluded.* Since overt actions are the primary resources that Chinese rely on to advocate for antibiotics, caregivers' covert advocating actions, such as candidate diagnosis, diagnosis resistance, and passive resistance (as reviewed in the previous section), are not included for analysis.

### 3.2.2.2 Overt advocating actions: definition and taxonomy

Overt advocating actions are here defined as caregivers' actions that are directly and explicitly connected to treatment negotiation. Based on this definition and the inclusion criteria, I identified four practices that caregivers use to overtly advocate for antibiotic treatment which are very similar to those used by parents in the American pediatric context (Stivers, 2002a). They include:

(1) evaluations of treatment effectiveness, (2) inquiries about antibiotic treatment, (3) statements of desire for antibiotic treatment, and (4) explicit requests for antibiotic treatment. These four types of advocating actions primarily vary in the dimension of their overtness and strength of advocacy, with the explicit requests being the most overt and strongest in advocacy and evaluations being the least. Illustrations of the four advocating actions and their variations will be presented in the Results section.

### 3.2.2.3 Overt advocating actions: type of treatment being advocated for

Each identified overt advocating action is coded for the type of antibiotic treatment being advocated for. In the Chinese pediatric context, antibiotic treatment embraces a range of treatment modalities. These include (i) oral antibiotic treatment, (ii) injection treatment, (iii) IV drip treatment, and (iv) hospital admission where antibiotic treatment can be given to patients through any of the former three methods. Although it is not always explicit in physicians' and caregivers' utterances as to whether antibiotics are involved in treatment modalities such as injection, IV drip, or hospital care; nonetheless, antibiotics are almost always included and oriented to as such<sup>4</sup> by caregivers. For this reason, all the above four types of treatment modalities are considered antibiotic treatment and are included for analysis.

Furthermore, in the coded data, caregivers' overt advocacy for the four modalities of antibiotic treatment are sorted into two categories: (1) oral antibiotic treatment (treatment modality (i) only), and (2) drip antibiotic treatment (treatment modalities (ii)-(iv)). The coding procedure for the type of antibiotic treatment being advocated for is explained in more detail below.

The type of treatment being advocated for is straightforward in caregivers' explicit requests for antibiotic treatment and inquiries about some particular treatment. However, evaluations and statements of desires can sometimes be less straightforward. Caregivers' evaluations of treatment and statements of desire for antibiotics can be formulated as in either positive formats or negative formats. While positive-format actions are explicit about what treatment is being advocated for, negative-format actions are less so. Understanding treatment advocacy thus relies on the "upper-

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<sup>4</sup> Since caregivers' orientation as to whether antibiotics are involved in treatment modalities such as injection, IV drip and hospital care is not the focus of our study in this dissertation, it will be discussed elsewhere.



bounding conversational implicature” associated with the ‘scalar implicature’ operation (Horn & Ward, 2006, p14; see also Sacks, 1992, p367-376 and Drew, 1992, p495-502).

The idea is that by negating a predication, the speaker denies the lower-bound implicature of the predication. For instance, by negating the predication "it is possible", the negated predication "it is not possible" conveys "it is impossible", rather than "there is at least some possibility". In the case of treatment advocacy, caregivers' negative-format actions such as "oral medication never works" generates the implication that the treatment modality that is more advanced or better than the oral medication should work; similarly, a negative-format statement of desire such as "he doesn't want to take oral medication" conveys that the treatment modality that is better than the oral medication is wanted.

Related to this ‘scalar implicature’ operation is an inferential process through which caregivers’ advocacy for IV drip treatment is understood by physicians as their advocacy for antibiotics that are administrated through the IV drip. The inferential process is operationalized based on a pecking order of the treatment modalities that are commonly available to the patients, namely, (1) non-antibiotic oral treatment, (2) antibiotic oral treatment, and (3) antibiotic IV drip treatment. More specifically, the three treatment modalities are conceptually ranked in accordance with their perceived strength and effectiveness – non-antibiotic oral treatment (e.g., cough syrup, Chinese anti-inflammatory medicine) is used for mild conditions that can be resolved easily and usually soon; whereas antibiotic IV drip treatment is used for severe conditions where even antibiotic oral treatment would not work or work as fast.

Based on the ‘scalar implicature’ operation and ‘pecking order’ inferential process, I followed the coding scheme below for coding the type of treatment being advocated for by caregivers’ evaluations and statements of desire.

*(i) Evaluations of treatment effectiveness:*

- Negative evaluations of oral treatment are coded as advocacy for IV drip treatment
- Positive evaluations of oral treatment are coded as advocacy for oral treatment
- Positive evaluations of IV drip treatment are coded as advocacy for IV drip treatment

*(ii) Statements of desire for antibiotic treatment:*

- Positive statements of desire for IV drip treatment are coded as advocacy for IV drip treatment
- Positive statements of desire for oral antibiotic treatment are coded as advocacy for oral antibiotics
- Negative statements of desire for oral non-antibiotics are coded as advocacy for oral antibiotics
- Negative statements of desire for oral antibiotics are coded as advocacy for IV drip treatment
- Negative statements of desire for oral treatment in general are coded as advocacy for IV drip treatment

3.2.2.4 Sequential position

In addition, I analyze caregivers' overt advocating actions in terms of their sequential placement. Two dimensions of the sequential position of an advocating actions are discussed: (1) *local sequential position* and (2) *global sequential position*.

*Local sequential position* refers to the sequential position of an action within its local adjacency pair organization (Schegloff, 2007). Caregivers' advocating actions are distinguished into two types: (i) *sequence-initiating position*, and (ii) *sequence-responding position*. Although a speaker's turn at talk can be considered to be both responding to a prior turn and initiating a new sequence at the same time in many cases, I distinguish the local sequential position of the caregivers' advocating actions in terms of whether they are produced on the initiative of the caregivers themselves or they are produced as a reaction to the physicians' invitation. Specifically, advocating actions that are produced on their own initiative are coded as occurring in the *sequence-initiating position*, displaying more caregiver agency;

whereas advocating actions that are produced as a reaction to the physician's invitation are coded as occurring in the *sequence-responding position*. This way of distinguishing the caregivers' advocating actions thus highlights the agentive role of caregivers' advocating actions. This will be explained in greater detail in the Results section.

*Global sequential position* refers to the sequential position of an action in the overall organization of the consultations. The overall phase structure of the medical consultations follows that of primary care consultations proposed by (Byrne & Long, 1976) and Robinson (2010), including: 1) problem presentation, 2) history-taking, 3) physical examination, 4) diagnosis, 5) treatment decision, and 6) closing. This phase structure of the pediatric acute visit is generally the same as that in the American primary care visit (Robinson, 2012), though some variations exist within the treatment phase<sup>5</sup>. To examine whether caregivers tend to use more overt form of advocating actions in later phases of the consultations, the six consultation phases are further divided and coded into two types, *earlier* (phase 1-3), and *later* (phase 4-6); and the four advocating actions are sorted into two categories, *more overt* (explicit requests and statements of desire) and *less overt* (inquiries and evaluations of treatment effectiveness).

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<sup>5</sup> The variation of the organization within the treatment phase has to do with the different activity goals within this phase. Since the availability of IV drip treatment modality is unique to the Chinese setting but absent in similar US context, physicians and caregivers typically first decide whether IV drip vs. oral treatment is used and then decide which specific type of oral medication is prescribed in the treatment phase of Chinese pediatric encounter.

### 3.2.2.5 Recoded variables

The above scheme is used for the coding of all overt advocating actions used by caregivers in the data set. Since caregivers might deploy more than one advocating action in a single encounter, I construct a series of recoded variables to reflect the following respects of caregivers' treatment advocacy in each encounter in the data set: (i) the most overt form of advocating action used by the caregiver in each encounter – a 4-level categorical variable (1=explicit request, 2=statement of desire, 3=inquiry, 4=evaluation), and (ii) the number of overt advocating actions used in each encounter – a numerical variable (range: 0-6). Based on (ii), one additional binary variable is constructed (1=higher number of advocating actions used – more than one overt advocating actions used, 0=lower number of overt advocating actions used – only one overt advocating action used).

### 3.2.2.6 Prescribing outcomes

The prescribing outcome of each encounter is coded into three categories: (1) non-antibiotic treatment, (2) oral antibiotic treatment, and (3) drip antibiotic treatment, using the same conceptualization described earlier. Based on this, to test whether caregivers' use of advocating actions affects the physicians' prescribing decision in terms of whether antibiotics are prescribed at all, the three-level prescribing outcome variable is then recoded to a binary variable to indicate whether the prescribing outcome is antibiotic or not (1=antibiotic, 0=non-antibiotic). In addition, to test whether caregivers' use of advocating actions affects the physicians' prescription of IV drip treatment, the 3-level categorical variable is also recoded into another binary variable in terms of whether the prescribing outcome is drip or not. These two recoded binary variables are used separately in a *Chi-square* test of associations between caregivers' use of advocating actions and physicians' prescriptions.

### 3.2.2.7 Descriptive analyses and tests of associations

Descriptive analysis is used to investigate (i) the caregivers' overt advocating actions, (ii) the type of treatment being advocated for, and (iii) the prescribing outcome of each encounter. Results of these variables are described in frequencies and percentages.

Statistical tests are used to examine the association between caregivers' overt advocating actions and physicians' prescriptions. My hypotheses are (1) caregivers' deployment of at least one of the overt advocating actions is significantly associated with physicians' prescriptions of antibiotics; (2) each of the four types of caregivers' overt advocating action significantly affects physicians' prescriptions; and (3) caregivers' use of a higher number<sup>6</sup> of the overt advocating actions significantly affects physicians' prescriptions. A *Chi-square test of independence* is used for the three sets of tests, with a significance level of 0.05.

## **3.3 Results**

In this section, I present my findings and evidence to show how demand-side factors, i.e., caregiver advocating actions for antibiotics influence physicians' antibiotic prescriptions in medical interactions. I will demonstrate the results in the following three steps: (1) I illustrate the conversation actions that caregivers use to overtly advocate for antibiotic treatment – what they are, how often they are used, and what they are used for; (2) I show how caregivers' orientation toward their rights and physicians' authority in treatment decisions is displayed through the production of the actions – their turn design and sequential placements, and lastly, (3) I provide statistical results

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<sup>6</sup> Number of overt advocating actions here refers to the total number of overt advocating actions used by caregivers in one visits – this might include caregiver use of multiple types of advocating actions or use of single type of advocating action for multiple times.

on the associations between caregivers’ overt advocating actions and the prescribing outcomes. Moreover, I also compare caregivers’ overt advocating actions to those in the American pediatric encounters in terms of their frequency and qualitative design. The differences between caregivers’ behaviors in the two country settings suggest that Chinese caregivers adopt a stance as more entitled and more assertive in their relationship with physicians than in the American system; this relationship and the behaviors that instantiate it are important contributors to the antibiotic over-prescribing problem in China.

### 3.3.1 *How do caregivers advocate for antibiotic treatment in pediatric encounters?*

In this section, I describe my findings on caregivers’ overt advocating actions, answering the questions: (i) What are they? (ii) How often are they used? (iii) What type of antibiotic treatment is being advocated for?

As briefly mentioned earlier, Chinese caregivers have interactional resources to overtly advocate for antibiotic treatment that are similar to those of their American counterparts’, including (1) *evaluations of treatment effectiveness*, (2) *inquiries about antibiotic treatment*, (3) *statements of desire for antibiotic treatment*, and (4) *explicit requests for antibiotic treatment*.

These overt advocating actions, rarely used in American pediatric encounters, are much more frequently used by Chinese caregivers to communicate their desire and pressure for antibiotic prescriptions. Table 3-1 illustrates the distribution of the four overt advocating actions in the Chinese data set.

**Table 3-1.**  
**Caregiver Overt Advocating Actions for Antibiotic Treatment (N=187)**

<b>Action Type</b>	<b>Number of visits in which this is observed</b>	<b>Percentage of visits in which this is observed</b>
<b>Evaluations of Treatment Effectiveness</b> e.g., <i>Oral medication won't work.</i>	26	14%

<b>Inquiries about Antibiotic Treatment</b> e.g., <i>Does he need any IV drip?</i>	50	27%
<b>Statements of Desire for Antibiotic Treatment</b> e.g., <i>He doesn't want to take oral medicine.</i>	14	7%
<b>Explicit Requests for Antibiotic Treatment</b> e.g., <i>(Could you) prescribe us some oral antibiotics?</i>	10	6%
<b>Total Number of Visits with One or More Actions</b>	<b>100</b>	<b>54%</b>

\*Note: Total number of acute visits is 187.

In total, caregivers' overt advocating actions are observed in 54% of the Chinese data set (n=100); whereas parent overt advocating actions are observed only 9% of the time in American pediatric encounters (Stivers, 2002a). Since American parents primarily rely on covert advocating actions to communicate their desire and pressure for antibiotics, this result reveals that Chinese caregivers are more overt about their advocacy for antibiotic treatment.

Moreover, the types of antibiotic treatment being advocated for are also strikingly different from those in American pediatric encounters. Table 3-2 shows the type of antibiotic treatment being advocated for by caregivers in the number of visits in the data set<sup>7</sup>.

**Table 3-2.**  
**Type of Antibiotic Treatment Being Advocated For (in number of visits) (N=100)**

<b>Action Type</b>	<b>Oral Antibiotics</b>	<b>IV Drip Antibiotics</b>	<b>Total Number of Visits</b>
<b>Evaluations of Treatment Effectiveness</b>	7	19	26
<b>Inquiries about Antibiotic Treatment</b>	16	34	50
<b>Statements of Desire for Antibiotic Treatment</b>	1	13	14
<b>Explicit Requests for Antibiotic Treatment</b>	7	3	10
<b>Total Number of Visits</b>	31 (31%)	69 (69%)	100 (100%)

Note: If there are multiple overt advocating actions, the strongest type of treatment being advocated for by the caregiver is coded for the visit.

<sup>7</sup> Note that there may be more than one overt advocating actions produced in a single visit, the treatment being advocating in each visit is coded with the perceivedly strongest type of treatment being advocated for.

As shown in Table 3-2, caregivers' overt advocacy is predominantly for drip antibiotic treatment – among the visits in which antibiotic treatment is advocated, IV drip antibiotic treatment is advocated for in as high as 69% of the visits (n=69). This is also strikingly different from American pediatric encounters, as American parents only orient to oral antibiotics as negotiable in medical consultations (Stivers, 2000); IV drip antibiotic treatment is never advocated for as a treatment modality option in the American pediatric encounters.

In sum, caregivers' overt advocacy for antibiotic treatment is observed in more than half of the acute pediatric visits. Although the result is not directly comparable to the findings reported in Chapter 2 with respect to caregivers' self-reported desire for antibiotic prescriptions in their most recent medical visit, when it is compared to parents' overt advocacy for antibiotics in the American context, it is found that Chinese caregivers are more overt in their treatment advocacy and more frequently exert pressure on physicians to prescribe antibiotics and to use more powerful delivery modalities. This thus indexes a physician-caregiver relationship in which caregivers assert more agency and entitlement in treatment decision making, compared to that in the American pediatric setting.

The high frequency of caregivers' overt advocating actions and the differences in the interactional resources that caregivers primarily rely on to advocate antibiotic treatment in the Chinese and American pediatric contexts is striking, yet this may not fully explain the difference between the two countries. I now turn to illustrate how and when caregivers are most likely to produce these advocating actions when they are interacting with their physicians. In the next section, I describe caregivers' overt advocating actions for antibiotic treatment in terms of their turn design and sequential environment. This provides qualitative evidence for how caregivers' demands for antibiotic treatment can influence physicians' prescriptions.



### 3.3.2 *How do caregivers orient to their rights and physicians' authority in antibiotic treatment decisions?*

In this section, I illustrate how the four types of overt advocating actions are produced as part of an interactional process. I argue that by using these overt advocating actions, caregivers display a high level of agency, yet orient toward their rights as shared with physicians in antibiotic treatment decisions. This can be evidenced in two respects: on the one hand, although caregivers' advocating actions vary in their degree of overtness and imposition on physicians' actions in turn design, physicians respond to all of them as being under pressure for prescribing; on the other hand, caregivers still orient to physicians' authority in the matter, as their advocating actions are produced in a cautious manner, clustered in later phases of the medical encounter rather than earlier. I explain these two respects in greater detail in the following sections.

#### 3.3.2.1 *Caregiver agency and entitlement: Turn design of advocating actions*

In the following section, I illustrate caregivers' overt advocating actions for antibiotic treatment more granularly in their local interactional contexts. I show that the four advocating actions, namely, (i) *evaluations of treatment effectiveness*, (ii) *inquiries about antibiotic treatment*, (iii) *statements of desire for antibiotic treatment*, and (iv) *explicit requests for antibiotic treatment*, fall on a scale of ascending degree of overtness and imposition on physicians' actions; and they display an overall higher level of caregiver agency in antibiotic treatment decisions than in the American system.

##### *(1) Evaluations of treatment effectiveness*

Evaluations of past treatment involve caregivers' assessments of the effectiveness of particular treatments. The treatments being evaluated can be ones used for the condition under consultations prior to the visit (as the previous chapter shows, caregivers commonly self-manage

their child's conditions with medications prior to medical visits), or they can be for some other general treatment modality.

In the American pediatric context, Stivers (2002a) observed that mentioning past experience with antibiotic treatment are a relatively common action that parents used to explicitly communicate pressure for antibiotics; in Chinese pediatric consultations, caregivers' evaluations of treatment effectiveness occur in 14% of the acute visits (n=26), also representing a relatively common action that caregivers use to advocate for antibiotics.

The following excerpt illustrates an example of parent mentions of past experience with antibiotic treatment in a US pediatric encounter. In this example, by minimizing the severity of the problem in her online commentary (Heritage & Stivers, 1999), the physician is heading toward a non-antibiotic treatment recommendation (lines 11-12). In this environment, the mother announces that another physician put the patient on an antibiotic for five days for a similar condition in the past (lines 14, 16/18), and the antibiotic was effective in treating the problem (lines 22-23).

Example 1\_US evaluation

(6) 1136 (Dr. 2)

1 MOM: I wantchu tuh look at his throat though cuz I've  
2 got uh really sore throa:t, an' I[:=wanta see if=  
3 DOC: [ (Ope-) open your mouth  
4 MOM: =[he does.  
5 DOC: =[rea:l big.  
6 (0.4)  
7 DOC: Open big.  
8 (1.0)  
9 DOC: Ah:::  
10 MOM: [Can you stick your tongue out? Euh:::  
11 DOC: [Yeah his  
12 tonsils ('re) uh little red too:,  
13 (1.5)  
14 MOM: -> Now Docto:r- (.) Sa:nders?, We came in on a weeke:nd?,  
15 (.)  
16 MOM: -> a[nd he gave him this medication that we only gave=  
17 DOC: [Mm hm,  
18 MOM: -> =him fi:ve [day:s.  
19 BOY: [( )  
20 (0.4)  
21 DOC: Oh that ('s) Zithroma:x,  
22 MOM: -> A:n' I'll tell ya tha:t kicked that cou:gh:,  
23 -> an' kicked that co:ld,  
  
((5 lines of talk between MOM and BOY not shown))  
  
29 MOM: This is [thuh drawer.  
30 DOC: [Okay how much does he wei:gh.=Zithromax  
31 goes by weight.

Stivers (2002a) argues that the mother's description of a past experience with an antibiotic is hearable as advocating for that treatment for the patient's current condition. Following this evaluation, the physician treats the parent as having suggested an antibiotic treatment by beginning a possible concession toward the previous treatment recommendation (line 30). This case thus exemplifies how parents' descriptions of past experiences using antibiotics can be hearable as an implied treatment preference in American pediatric encounters.

In the Chinese pediatric context, evaluations of treatment effectiveness are similarly deployed by caregivers to advocate for antibiotic treatment from their physicians. Caregivers' evaluations can be produced in two formats: (1) positive evaluations of past treatment, and (2) negative evaluations of past treatment. Positive evaluations are similar to the case shown above in American pediatric encounter – a positive evaluation of the treatment implies a preference for the treatment; whereas a negative evaluation of some treatment in the past works less directly by implying a dispreference for the treatment and thus a preference for an alternative 'stronger'

treatment – via the ‘scalar implicature’ mechanism of treatment preference communication. Regardless of their format, caregivers’ evaluations of treatment effectiveness are recurrently understood by physicians as treatment advocacy and thus put physicians under great pressure to prescribe. The following excerpts illustrate two examples of positive evaluations and two examples of negative evaluations in the Chinese context.

*(i) Positive evaluations*

In the first example, the caregiver complains about the patient’s coughing and describes it as very heavy the night before. After a physical examination, the physician diagnoses the patient with trachitis. At line 1, the physician suggests the patient take Azithromycin, an oral antibiotic. The mother resists this, informing the physician that the patient has been on oral Azithromycin (line 2) for two days prior to the visit (line 5). After some discussion of the medication dosage (lines 7-9) and while the physician is working on medical records (line 10), the caregiver issues a positive evaluation of IV drip treatment at line 11.

Example 2\_07\_1125\_17

Symptoms: Coughing

D: Doctor, M: Mother

- 1 D: 我建议你还是吃 - 吃点个阿奇霉素。  
wo jianyi ni hai shi chi chi dian-ge aqimeisu  
I suggest you still is eat eat some Azithromycin  
'I suggest you still take some oral Azithromycin.'
- 2 M: 阿奇霉素 - 就是吃了阿奇霉素。  
aqimeisu jiushi chi le aqimeisu  
Azithromycin just is eat PT Azithromycin  
'Azithromycin- (We) indeed had oral Azithromycin.'
- 3 D: 已经吃了啊? 吃了几天啦?  
yijing chi le a chi le ji tian la  
already eat PT PT eat PT how-many day PT  
'(You've) already taken it? For how many days?'
- 4 M: 吃了两天了。  
chi le liang tian le  
eat PT two day PT  
'(We've) been taking it for two days.'
- 5 D: 吃了两天啦?  
chi le liang tian la  
eat PT two day PT  
'For two days?'
- 6 M: 嗯, 咳得狠呢。

en ke de hen ne  
 yeh cough PT bad PT  
 'Yeah. (He) coughed really bad.'  
 7 D: 你吃了多少啊?  
 ni chi le duoshao a  
 you eat PT how-much PT  
 'How much did you take?'  
 8 M: 吃一颗。  
 chi yi ke  
 eat one CT  
 'One pill (a time).'  
 9 D: 哦，九岁要吃一片半。  
 o jiu sui yao chi yi pian ban  
 ok nine year-old need eat one CT half  
 'Ok. A nine-year-old needs to take one and a half.'  
 10 ((Physician working on medical records))  
 11 M: **挂水来得快。**  
 gua shui lai de kuai  
 drip fluid come PT fast  
 '**Drips work fast.**'  
 12 D: 你要挂水啊?  
 ni yao gua shui a  
 you want drip PT  
 'You want drips?'  
 13 M: 哎。  
 ai  
 yeh  
 'Yeh.'

Here, the caregiver evaluates the IV drip treatment generally as taking effect faster than other type of treatment (i.e. oral medication). Following the evaluation, the physician produces an understanding check, seeking the caregiver's confirmation that she wants to have IV drip treatment for the patient's condition (line 12); this understanding is then confirmed by the caregiver at line 13. The physician's response thus clearly registers her understanding that the caregiver's positive evaluation of the IV drip antibiotic treatment<sup>8</sup> indexes advocacy for that treatment.

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<sup>8</sup> It is noted that although the surface semantics of the caregiver's turn do not explicitly indicate that the IV drip treatment involves antibiotics, such overt advocacy is usually understood as advocating for IV antibiotics. This can be seen in this example – the physician's original treatment recommendation is to put the patient on oral antibiotics; the treatment negotiation following this recommendation is thus not about antibiotics per se but rather about how antibiotics are administrated (i.e. oral vs. IV drips).

Example 3 is another example of a caregiver's positive evaluation of IV drip treatment. In this case, the patient is also brought in for coughing. Just prior to the excerpt shown, the physician examined the patient's throat and asked the caregiver if the patient caught a cold during sleep. The physician then starts to take the history of the patient's immunity (lines 1-2) and solicits the caregiver's opinion about the oral medication as a treatment option (line 3). Following the physician's solicitation, the caregiver issues an evaluation (line 4).

Example 3\_05\_0917\_17

Symptoms: Coughing for one day, sore throat

D: Doctor, M: Mother

- 1 D: 平时 体质 还 好 吧?  
pingshi tizhi hai hao ba  
usually physique still good PT  
'*Is his physique still good usually?*'
- 2 M: 平时 就 是 老 是 咳 嗽,  
pingshi jiu shi lao shi kesou  
usually just is always is cough  
不 怎 么 感 冒, 就 是 咳 嗽。  
bu zenme ganmao jiu shi kesou  
not much cold just is cough  
旁 的 没 有 什 么, 就 是 咳 嗽。  
pangde meiyou shenme jiu shi kesou  
other not what just is cough  
'*(He) just coughs a lot.  
Not much cold. Just coughing.  
Nothing else. Just coughing.*'
- 3 D: 吃 药 能 好 吧?  
chi yao neng hao ba  
eat medicine can good PT  
'*Can he get well with oral medication?*'
- 4 M: 不 能, 每 次 都 是 挂 水,  
bu neng mei ci doushi gua shui  
not can every time all is drip water  
挂 的 阿 奇 和 氨 溴 索。  
gua de aqi he anxiusuo  
drip PT Azith and Ambroxol  
要 不 然 没 得 下 来。  
yaoburan mei xialai  
otherwise not PT down  
'*No. (We) used drips every time.  
(He) had Azith and Ambroxol.  
Otherwise, it won't come down.*'  
((Physician conducting stethoscopic examination))
- 5
- 6 D: 吃 药 都 不 管 用 啊?  
chi yao dou bu guanyong a  
eat medicine all not working PT  
'*Oral medication didn't even work?*'
- 7 M: 嗯。只 有 挂 水。  
en zhi you gua shui  
yeah only drip water  
'*Yeah. Only drips.*'
- 8 D: 行 啊, 那 就 给 你 挂 吧。

xing a na jiu gei ni gua ba  
alright PT then just give you drip PT  
'Alright. Then I'll let you have drips.'

The caregiver's evaluation turn is first produced with a negative evaluation of the oral treatment (to be discussed in more detail in the next section); she then positively evaluates the IV drip treatment in two dimensions: 1) IV drip treatment has been routinely used for the patient in the past, and 2) IV drip treatment has been effective in managing the patient's conditions.

Subsequent to this positive evaluation of the IV drip treatment, the physician again seeks confirmation from the caregiver about the (in)effectiveness of the oral medications (line 6); this is then confirmed by the caregiver with an upgraded positive evaluation of the IV drip treatment – the patient's condition could only be managed with IV drip treatment (line 7). Consequently, at line 8, the physician concedes to offer the IV drip treatment to the patient.

The physician's response at line 8 clearly registers her understanding that the evaluation is an advocacy for the IV drip treatment and her offer of the IV drip treatment is a concession to the caregiver's demand (line 8). This is evidenced by the fact that 1) the physician's turn is produced with *xing a* 'Alright' as the first TCU, treating herself as responding to request/advocacy somehow, 2) by prefacing the second TCU with the conjunction word *na* 'then', the physician suggests there is a causal relationship between her offer of the treatment and the caregiver's action in the prior turn(s). This example thus shows that the physician displays herself as pressured to prescribe antibiotics in the face of the caregiver's advocacy.

#### *(ii) Negative Evaluations*

Similar to positive evaluations, negative evaluations of treatment effectiveness are also recurrently understood by physicians as pressuring for prescriptions. Example 4.1 illustrates an example of caregivers' negative evaluation of oral treatment – an advocacy for IV drip treatment, by scalar implicature. In this example, the patient is visiting for a fever. Prior to the visit, the patient has

done a blood test and the result has shown no sign of bacterial infections. Given this non-problematic exam result, the physician offers the treatment recommendation that the child take oral medicine at line 1. Receiving no uptake from the caregivers (line 2) – passive treatment resistance (Heritage & Sefi, 1992; Stivers, 2005), the physician pursues the grandparents’ acceptance by mentioning again the blood test result at line 3. This pursuit of acceptance is overlapped with the grandmother’s evaluation of the oral medication treatment at line 4 – *‘it won’t work. Taking oral medication can’t bring it down for us.’*

Example 4.1\_07\_1125\_14

Symptoms: fever, cough (not definitely)

Blood test finds no bacterial infection.

D: Doctor, GM1: Grandmal, GM2: Grandma2, P: Patient

- 1 D: 实际上啊, 你这个  
shijishang a, ni zhege  
actually PT you this  
还是要继续吃药。  
haishi yao jixu chi yao.  
still need continue eat medicine  
*‘Actually, with this (hemogram), you still need to go on  
taking (oral) medicine.’*
- 2 (.)
- 3 D: [你这个血象啊-  
[ni zhege xuexiang a-  
you this hemogram PT  
*‘Your hemogram,’*
- 4 GM1: [没的用诶,  
[meide yong ei,  
not working PT  
我们吃药吃不住哎,  
women chi yao chi bu zhu ai,  
we eat medicine eat not down PT  
***‘It won’t work.  
Taking oral medication can’t bring it down for us.’***
- 5 D: 你这个血象也不高哎,  
ni zhege xuexiang ye bu gao ai,  
you this hemogram also not high PT  
*‘Your hemogram isn’t high.’*

The caregiver’s evaluation can be hearable as advocating for an alternative treatment primarily because of its sequential position. Being produced in this sequential environment in which an acceptance of the physician’s treatment recommendation is oriented to as relevant and preferred, it is thus understood as the caregiver actively resisting the treatment recommendation (Stivers, 2005) and advocating for an alternative treatment. Subsequently, at line 5, the physician continues her



previous turn by referring back to the unproblematic blood test result – again pursuing the grandmother’s acceptance of the recommended oral treatment.

Although negative evaluations of treatment effectiveness do not explicitly nominate any particular treatment as favorable, they nonetheless register the evaluated treatment as ineffective and imply a need for a more effective treatment plan by scalar implicature. As Kendrick & Drew (2014) argue, a report of a problem indexes a need for help. It is in this sense that the caregiver’s negative evaluations of the recommended oral treatment work to advocate for IV drip treatment, a perceived to be a more advanced and effective treatment modality (Reynolds & McKee, 2011).

In this case, the caregiver’s advocacy for the IV drip treatment becomes more intense as the interaction proceeds. This is shown in Example 4.2 below, continuing from the above excerpt.

Example 4.2\_07\_1125\_14 [continuing from Example 1]

- 6 GM2: 不高是啊?=  
bu gao shi a?=  
not high is PT  
'Not high, is it?'
- 7 D: =嗯, 才五千多.  
=en, cai wuqian duo.  
yeah only five-thousand more  
'Yeah, only over five-thousand.'
- 8 GM1: 哎, 对的哎, 我家吃药吃不住哎,  
ai, duide ai, wo jia chi yao chi bu zhu ai,  
yeh right PT our home eat medicine eat not down PT  
'Yeh, right. Taking oral medicine can't bring it down for us.'
- 9 GM2: 挂两天水-  
gua liang tian shui-  
have two day drip  
'Have two-day's drip,'
- 10 D: 你挂两天水, 挂那个- 抗病毒的,  
ni gua liang tian shui, gua nage kang bingdu de,  
you have two day drip have that anti-viral PT  
你挂那个头孢 实际上也没用.  
ni gua nage toubao shiji shang ye mei yong.  
you take that Cephalo actually also not working  
You have two-day's drip.  
'Use that anti-virial (medicine) for drip.  
Cephalo doesn't really work.'

Following the physician’s pursuit of the grandmother’s acceptance (Example 4.1, line 5), the caregiver (GM1) first resists the unproblematic exam result with a partial repeat of the physician’s turn (line 6), registering it as a piece of news (Heritage & Sefi, 1992; Stivers, 2005). This is treated by

the physician as a confirmation-seeking action by confirming the question; she then pursues the grandmother's acceptance again by numerating the blood test result (line 7). In response, the grandmother negatively evaluates the effectiveness of the oral medication treatment (line 8).

By only acknowledging the unproblematic blood test result in the first place, the grandmother still does not accept the treatment. Following this negative evaluation, the other grandmother (GM2), comes in to suggest "have a two-day drip" (line 9), surfacing the caregivers' advocacy for IV drip antibiotic treatment in the interaction. Subsequently, the physician subverts the caregivers' treatment advocacy for an antibiotic drip by pushing for an anti-viral drip at line 10. This example thus shows both negative evaluations and positive evaluations are implemented and understood as pressure for prescriptions.

Example 5 provides another example of a caregiver's negative evaluation of oral treatment as advocacy for IV drip treatment. In this case, the patient again presents with coughing. In the history-taking phase, the grandmother informs the physician that the patient has already taken oral antibiotics prior to the visit (line 4). The physician then starts to invite the grandmother to evaluate the effectiveness of the oral antibiotic medicine (lines 5, 7, 10). Following the physician's solicitation, the grandmother produces a negative evaluation of the oral antibiotic treatment (line 12).

Example 5\_05\_0929\_05

Condition: Coughing

GM: Grandmother, D: Doctor

- 1 GM: 白天就咳得厉害呢,  
baitian jiu ke de lihai ne  
daytime just cough PT hard PT  
晚上也咳。  
wanshang ye ke  
night also cough  
'She coughs hard in the day time.  
Night time as well.'
- 2 D: 嗯,有痰呢。  
en you tan ne  
yeah have phlegm PT  
'Yeah. (She) has some phlegm.'
- 3 (2.8)
- 4 GM: 吃的点头孢克圪。  
chi de dian toubaoke wu  
eat PT some Cefixime  
'(We) had a little Cefixime.'

((4 lines of history-taking omitted))

- 5 D: 原来像这样吃,  
yuanlai xiang zheyang chi  
original like this eat  
管得住吧?  
guan de zhu ba  
manage PT PT PT  
'Taking (oral medication) at home like this in the past,  
did it work?'
- 6 GM: 啊?  
a  
huh  
'Huh?'
- 7 D: 原来像这样吃药,  
yuanlai xiang zheyang chi yao  
original like this eat medicine  
管得住吧?  
guan de zhu ba  
manage PT PT PT  
'Taking oral medication at home like this in the past,  
did it work?'
- 8 (1.8)
- 9 GM: 什- 什么叫管得住?  
shen-shenme jiao guan de zhu  
wh- what call manage PT PT  
What do you mean by "work"?
- 10 D: 你说, 原来像这样咳嗽,  
ni shuo yuanlai xiang zheyang kesou  
you say original like this cough  
吃药管得住吧?  
chi yao guan de zhu ba  
eat medicine manage PT PT PT  
'You say, coughing like this in the past,  
did taking oral medication work?'
- 11 (2.0)
- 12 GM: 管不住哎。  
guan bu zhu ai  
manage not PT PT  
'It didn't.'
- 13 D: 就是的。  
jiu shi de  
just BE PT  
'Indeed.'
- 14 GM: 她难好呢。  
ta nan hao ne  
she hard well PT  
'It's hard for her to get well.'
- 15 (1.8)
- 16 D: 那就挂水。  
na jiu gua shui  
then just drip water  
'Then (let's) have some drip.'
- 17 GM: 她是难得咳嗽的,  
ta shi nande kesou de  
she BE hardly cough PT  
就四月份就咳, 咳了肺炎。  
jiu siyuefen jiu ke ke ke le feiyan  
just April just cough cough cough PT pneumonia  
'She hardly coughs.'

- It was just April, she coughed and coughed.  
(She) got pneumonia. '*
- 18 D: 哦。  
o  
ok  
'Ok.'
- 19 GM: 所以就有点害怕。  
suoyi jiu you dian haipa  
so just a-little fear  
'So (we) are just afraid.'
- ((5 lines of discussion of drip))
- 20 GM: 挂水来得快,  
gua shui lai de kuai  
drip water come PT fast  
上次挂了, 第二天就好了。  
shangci gua le dier tian jiu hao le  
last time drip PT second day just well PT  
'Drip works fast.  
*Last time we had drip, (she) got well the second day.'*

As shown in the excerpt, the caregiver's negative evaluation of the oral treatment displays her unfavorable stance toward the treatment. In response to the caregiver's evaluation – '*it's hard for her to get well (with oral medication)*' at line 14, the physician concedes to offer IV drip treatment for the patient (line 16).

In the face of the caregiver's evaluation, the physician displays herself as under pressure to prescribe the advocated IV drip treatment. This can be manifested in her response design, which positions as responsive to the caregiver's opinion of treatment preference (line 16). For example, her offer of the treatment is prefaced with the conjunction word *na* ('*then/so*'), which suggests a causal relationship between the physician's current action (IV drip treatment recommendation) and the caregiver's negative evaluation (dispreference for oral antibiotic treatment) in the prior turns.

Moreover, the grandmother also treats her own evaluation as advocating for treatment and thus somewhat accountable in this social institutional setting. This can be evidenced by her subsequent turns, in which she accounts for her action by stating (1) she is worried that the condition will turn into pneumonia as it has happened in the past (lines 17 and 19), and (2) she believes the IV drip treatment works faster, as proven in her past experiences (line 20). This case

thus shows that the evaluations of treatment effectiveness are produced by the caregiver and understood by the physician as advocating for IV drip treatment, and the physician is pressured to prescribe that treatment to the patient.

In sum, these examples show that although on the surface, the evaluations are caregivers' assessments of the effectiveness of some particular treatment, they are frequently understood by physicians as treatment advocacy in this social and interactional setting, where the primary activity goal is to seek a medical solution for the child's health condition. In response to such treatment advocacy, physicians display themselves as under great pressure to prescribe the antibiotic treatment being advocated for – in many cases, the physicians' initial treatment recommendations are subverted and the caregiver-advocated antibiotic treatment is offered instead.

Second, these evaluations are both more frequent in the Chinese clinic context and their formulations display a high level of caregiver agency in treatment decision making. Conventionally, although parents have first-hand experience of changes in their children's condition, evaluations of treatment effectiveness are within the physicians' domain of expertise. Patients or their caregivers are only obligated to provide the information to support physicians' decisions with regard to their child's conditions. Therefore, when caregivers do make judgments on the effectiveness of the treatment, their actions can be considered trespassing into the physician's domain of knowledge and expertise, thereby challenging the physician's medical authority. It is also in this sense that caregivers display a high level of agency and put physicians under a substantial amount of pressure to prescribe inappropriately.

Third, compared to parent descriptions of past experiences with particular treatments in the American pediatric encounters, Chinese caregivers' evaluations of treatment effectiveness are much more overt and assertive in their treatment advocacy. Physicians in Chinese pediatric encounters are facing a higher level of pressure for over-prescribing from caregivers than their American

counterparts, and thus this parent behavior may be an important contributor to physicians' decisions to prescribe. We see some indication of this already in their responses in Example 3 and Example 5, in which the physicians' solicitation of the caregivers' views about oral (antibiotic) medication treatment projects a plausible recommendation for oral (antibiotic) treatment; nevertheless, following the caregivers' evaluations, the physicians agreed to prescribe IV drip (antibiotic) treatment to the patients. Physicians' responses to caregivers' overt advocating actions for antibiotic treatment will be addressed fully in Chapter 5.

Among the four overt advocating actions, the evaluations are the least overt and implement the least pressure. This is because they do not require a specific type of response, and the understanding of the treatment advocacy relies on the inferential operation associated with the 'scalar implicature' (particularly in the case of negative-format evaluations).

In addition, within the caregivers' evaluations as an overt advocating action, there are cases in which caregivers display a higher level of agency and assertiveness and in other cases a lower level of agency and assertiveness. For example, caregivers' evaluations of treatment effectiveness can be produced as either sequence-initiating actions (initiated on the caregiver's part) or as sequence-responding actions (responding to physicians' initiation). When evaluations of treatment effectiveness are produced on the sole initiative of the caregivers, they display a higher degree of agency and assertiveness than those produced as a reaction to the physicians' invitations. Characteristics of this distinction will be discussed in more detail later.

A more overt type of advocating action is a caregiver' inquiry about antibiotic treatment, through which caregivers not only proposes an interest or relevance with respect to the treatment, but also holds the physicians accountable for responding to that.

## *(2) Inquiries about antibiotic treatment*

A second action for overtly advocating for antibiotic treatment is to inquire about that treatment. By asking about a particular treatment in an acute visit, caregivers 1) raise antibiotic treatment for discussion, thus indicating an interest in it or understanding of its relevance, and 2) make relevant a type-conforming response to the question about the treatment from the physician, under the sequential constraints and preference organization of adjacency pairs (Schegloff, 2007). It is in this sense that inquiries about antibiotic treatment constitute a more overt form of advocating action that caregivers use to exert pressure on physicians.

In American pediatric encounters, Stivers (2002a) observed that inquiring about antibiotics is one of the more common ways that parents advocate for antibiotics. This is similarly the case in Chinese pediatric encounters – caregivers' inquiries about antibiotic treatment are the most common among caregivers' four overt advocating actions for antibiotic treatment, occurring in 27% of the acute visits (n=50). Given that overall overt advocating actions occur only 9% of the time in the US context (Stivers, 2002a), the frequency of caregivers' inquiries about antibiotic treatment is much higher in the Chinese setting.

An example of parent inquiry about antibiotics in the American pediatric setting is shown below. In this case, the physician has explained to the father that his daughter has a viral infection and has recommended “watching it” – essentially, a “no treatment” recommendation. After some discussion related to when the child can return to school and other treatments, the physician returns to the patient's symptoms and treatment (lines 1-3). In this environment, the father inquires as to whether the physician is going to prescribe antibiotics (line 4).

Example 6.1\_US inquiry

(3) P201 (Dr. 7)

1 DOC: She: doesn't have anything right no:w,  
2 any symptoms of mucus  
3 or vomiti[ng that's contagious.  
4 DAD: => [Are you gonna give her ana- antibiotics?  
5 DOC: Yeah- uh No : I don't have anything tuh treat right now  
6 for antibiotics. Her ears look really goo:d, .hh she has  
7 no sign of bacterial infection right no:w?  
8 DOC: .tlkh and that's (what) she'd get antibiotics fo:r.  
9 DOC: .hh So uh lotta times you can start out with uh virus  
10 like uh co:ld, (.) .h an:d if you- it goes on for uh while  
11 #uh:# bacteria (should) set in you can get uh secondary  
12 bacteria infection? and that's when you need antibiotics.

The question, as Stivers (2002a) argues, is designed so as to present the decision as the physician's. However, it is yes-preferring (Heritage, 2010), and the father later shows that this question has been an indication of his own preference for antibiotic prescriptions in the subsequent excerpt (lines 20-22).

Example 6.2\_P201 [continuing from Example 6.1]

17 DOC: right now.<Her ears look really good,<an' her tubes are  
18 in too:.  
19 DOC: .h And they're not draining or any[thing.  
20 DAD: => [It just means that-  
21 => ya know if she gets another fever we hafta bring her  
22 => ba:ck,  
23 DOC: .hh well what I'll do is she might still get uh fever: in  
24 tuh next couple uh #da:ys.# because: .h that's th' way  
25 viruses wor:k?, you can have- you know (how have=you)  
26 if you have uh co:ld, you can get a fever for uh few  
27 da:ys?

As mentioned above, the inquiry about the antibiotic treatment is produced in an environment where a non-antibiotic treatment recommendation has been made, and the father has been withholding his acceptance before he produces this inquiry about the alternative treatment – antibiotics. Although the inquiry itself does not request antibiotics, it overtly introduces antibiotics into the discussion, and its sequential environment makes it hearable by the physician as resisting her treatment recommendation and thus searching for alternative treatment.

In the following, I illustrate caregivers' inquiries about antibiotics in Chinese pediatric encounters. Among the four identified overt advocating actions, inquiries about antibiotic treatment



are the most frequently used by caregivers to advocate for antibiotic prescriptions. Example 7 and Example 8 illustrate how caregivers' inquiries about antibiotics are produced and understood.

In Example 7.1, the patient's primary complaint is a cough. After a physical examination (line 1), the physician delivers the diagnosis that the child is catching a cold (line 2). Receiving no uptake from the parent (line 3), the physician repeats the diagnosis and delivers an oral medication treatment recommendation in conjunction with the diagnosis (line 4). Following the physician's recommendation of oral treatment, the mother pauses for four seconds (line 5) and requests confirmation of the physician 'No drip?' (line 6).

Example 7.1\_02\_0923\_02

Symptom: cough

D: Doctor, M: Mother

- 1 ((检查咽喉))  
((examining throat))
- 2 D: 感冒了.  
ganmao le  
cold PT  
(He's got) a cold.  
3 (1.5)
- 4 D: 感冒, 有点 气管 炎症.  
ganmao, youdian qiguan yanzhen  
cold little airway infection  
吃点药吧?  
chi dian yao ba  
eat little medicine ba  
(He's got) a cold. A little infection in the airway.  
Take some oral medicine?  
5 (4.0)
- 6 M: 不挂水啊?  
bu drip a?  
no drip PT  
**No drip?**
- 7 D: 呃, 挂水不需要吧, 先吃点药.  
e, guasuhi bu xuyao ba, xian chi dian yao.  
uh drip no need PT first eat some medicine  
=能吃药好就尽量吃药好吧.  
=neng chi yao hao jiu jinliang chi yao hao ba.  
can eat medicine well then eat medicine good PT  
Uh, drip, no need. Take some medicine first.  
(If he) can get well with oral medication, just take medication, ok?
- 8 M: 哦, 好.  
o, hao.  
PT good  
Okay, good.

Although the question design tilts toward a 'No' as a grammatically preferred answer from the physician (Heritage, 2010), being in this sequential environment where the mother's acceptance

of the treatment recommendation is oriented to as relevant and preferred, the mother's inquiry is thus hearable as resisting the physician's oral medication treatment recommendation (Stivers, 2005). Moreover, apart from withholding the acceptance of the treatment recommendation, the inquiry also implicitly proposes an alternative treatment – IV drip treatment, by bringing it up to the surface of the interaction for discussion. Further, the caregiver inquiry also makes the physician's response regarding the IV drip treatment relevant in the next turn. It is in this sense that the caregiver's inquiry puts the physician under pressure to address the treatment advocacy.

The physician's response provides evidence that the caregiver's inquiry is understood as advocating for treatment rather than information seeking (line 7). This is shown in the following respects: 1) the response is prefaced with *uh*, marking her response as a dispreferred response (Kendrick & Torreira, 2015; Pomerantz, 1984); 2) the answer that the IV drip treatment is not necessary is produced with mitigation - the final particle *ba* at the second TCU reduces the assertiveness of the answer, making it a proposal in effect (Li & Thompson, 1981); 3) the physician's response also changes the topical agenda of question, as the question is about what the physician is going to do; whereas the physician's response is an objective evaluation of the patient's condition, for which IV drip treatment is not needed – a transformative answer by including the lexicon of *yao* ('need') (Stivers & Hayashi, 2010); 4) the re-offering of the oral medication recommendation is made contingent upon the prognosis of the condition, displaying a back-down from the previous stance; and 5) the re-offering of the recommendation is accounted for by the physician with a rationale as to when IV drip treatment should be used. All these features demonstrate that the physician is not only treating her response as providing the information sought, but also offering the treatment in response to the caregiver's advocacy for the inquired-about treatment.

Although the inquiry about the IV drip treatment does not semantically display the mother's stance as favoring the treatment, by bringing it up at all, the mother reveals an interest in IV drip

treatment. This is shown later (in Example 7.2), where the mother discloses that she had meant to raise the question of IV drip treatment earlier in the interaction (line 23).

Example 7.2\_02\_0923\_02

((13 lines of prescribing activities omitted))

- 21 ((处理处方))  
((Processing prescription))
- 22 D: 我感觉, 咳得还蛮厉害的嘛。  
wo ganjue, ke de hai man lihaide ma.  
I feel cough PT still rather bad PT  
'I feel, (he) coughs rather badly.'
- 23 M: 嗯, 我就是说给她挂-挂一瓶。  
en wo jiu shi shuo gei ta gua gua yi ping  
yeah I just say give he have have one bottle  
'Yeah, I was just saying give her a bottle of drip to have.'
- 24 D: 挂水呢, 不一定就是说马上见效。  
guashui ne bu yiding jiushi shuo mashang jianxiao  
drip PT not definitely just say right-away effective  
吃药也要看的, 吃个两三天,  
chi yao ye yao kan de chi ge liang san tian  
eat medicine also need see PT eat two three day  
如果加重了再过来看。  
ruguo jia zhong le zai guo lai kan  
if get worse PT again come over see  
用药有一个循序渐进, (.)  
yong yao you yige xunxujianjin, (.)  
use medicine have one stepwise-process  
知道吧?  
zhidao ba  
know PT  
'Drip, it doesn't say it will be effective immediately.  
(You'll) need to watch if you take medicine.  
Take two to three days.  
If it gets worse, (you'll) come over again.  
Medication choice is a stepwise process-  
Understand?'
- 25 M: 嗯。  
en  
yeah  
'Yeah.'
- 26 D: 你自己看呢?  
ni ziji kan ne?  
you self see PT  
'What do you think yourself?'
- 27 (7.0)
- 28 M: 那你开药吧。  
na ni kai yao ba.  
then you prescribe medicine PT  
'Then you (just) prescribe (oral) medicine.'

In Example 7.2, while the physician is processing the prescription slip, the patient's cough draws the physician's attention and she assesses it as somewhat concerning (line 22). After this assessment, the mother reveals that her inquiry earlier was indeed intended to ask for the IV drip treatment (line 23). The physician then again pursues the mother's acceptance of the oral medication

by providing a rationale for recommending the treatment (line 24). Although the mother accepts the oral treatment recommendation in the end, the physician backs down from her original stance by offering a contingency plan, to use IV drip treatment if the patient's condition does not improve after using the proposed oral medications for three days. Again, the physician's response displays herself as under pressure to provide unnecessary prescriptions.

Example 8 illustrates another case of a caregiver's inquiry about IV antibiotic treatment. In this case, the patient is visiting for fever and vomiting. The caregiver and the patient have just returned from a blood test. At line 1 and line 3, the physician produces an assessment of the diagnostic test result, assessing it as only slightly problematic. Although the actual treatment recommendation has not been delivered yet, the slightly problematic diagnostic test result is subject to the father's understanding that the condition requires more care. In this environment, the father produces an inquiry about IV drip treatment (line 6).

Example 8\_04\_1127\_01

Condition: fever, vomit

D: Doctor; F: Father; P: Patient

- 1 D: 有点高。  
youdian gao.  
a-little high  
*A little high.*
- 2 F: 啊?  
a?  
what  
*What?*
- 3 D: 稍微有点高啊。  
shaowei youdian hao a.  
slightly a-little high PT  
*Slightly a little high.*
- 4 (5.0)
- 5 ((书写病历))  
((writing on medical records))
- 6 F: **是挂水啊 还是怎么样?**  
shi guashui a haishi zenmeyang?  
is drip PT or what  
***Are (we) having drip, or what?***
- 7 (0.8)
- 8 D: 可以先吃点药试试,  
keyi xian chi dian yao shi shi,  
can first eat some medicine try try  
他就是吐哎, 是啊?  
ta jiu shi tu ai, shi a?  
he just vomit PT is PT  
*(You) could take some oral medicine and try first.*

9 F: *He just vomits, right?*  
 嗯.  
 en.  
 yeah  
 Yeah.

Although the father's inquiry about the IV drip treatment is appended with an increment – *haishi zenyang?* 'or what?' (Luke, Thompson, & Ono, 2012; Schegloff, 1996), downgrading the deontic stance embodied in the first TCU, the physician still treats the father's inquiry as advocating for the treatment, rather than a simple informational inquiry. This can be evidenced from the following respects of the physician's response – essentially a counter-proposal of oral medication treatment. First, the slight pause (line 7) following the father's inquiry displays some degree of hesitancy in responding, thus registering his response as a dispreferred social action (Kendrick & Torreira, 2015; Pomerantz, 1984). Second, the physician demonstrates that he orients to the father's inquiry and the implied advocacy as legitimate and thus taken into consideration: (1) the modal word *keyi* 'could' shows that the physician orients to the father's deontic right to share decision-making; (2) the lexical items *xian* 'first' and *shishi* 'have a try' are added to register the counter-proposal as tentative based on future contingencies; (3) the counter-proposal is also accounted for by reviewing the patient's vomiting, denying the severity of the condition, on which the father's advocacy is partially based.

In sum, caregivers' inquiries about antibiotic treatment are, like the evaluations in the first section, recurrently treated by physicians as advocating for that treatment. Although inquiries are a relatively frequent way by which caregivers advocate for antibiotics in American and Chinese encounters, the frequency of inquiries is nonetheless much higher in the Chinese pediatric context, again suggesting that caregivers are orienting to their right to shape the treatment outcomes as greater than parents in the American context.

Second, compared to caregivers' evaluations of treatment effectiveness, caregivers' inquiries about antibiotic treatment display a higher level of agency and epistemic independency in the action implementation. This is because, by nominating some particular treatment modality, the caregiver

presents their own view about a proper course of treatment for the patient's condition, without the physicians' instantiating. Although the inquiry still presents the decision as in the physician's hand, it nonetheless puts the physician in a position to address the caregivers' views about the treatment, which in many cases conflict with the physicians' views (e.g., Example 7.1 and Example 8).

Among the four overt advocating actions, the inquiries are the second least overt – although the inquires indicate an interest in antibiotic treatment or its relevance, they do not directly and explicitly display the caregiver's favoring stance toward the inquired treatment, as do statements of desire for antibiotic treatment – the third type of caregiver overt advocating action.

### *(3) Statements of desire for antibiotic treatment*

The third action that caregivers sometimes use to advocate for antibiotic treatment is to state their desires for, or desire not to have, some particular treatment. As described in Stivers (2002), explicit statements of a desire for antibiotics are quite direct in terms of communicating pressure for antibiotic treatment, though they do not require a physician to respond and in that sense, they are less direct.

In American pediatric encounters, Stivers (2002a) observed that this type of treatment advocating action is very rare; conversely, in Chinese pediatric encounters, caregivers' statements of desire for antibiotic treatment were observed in 7% of the acute visits (n=14), much more frequently than in the American dataset. The variation in the relative frequency of the action indicates that physicians are more frequently under pressure to deal with caregivers' overt treatment advocacy.

The following excerpt shows an example from the American pediatric context in which the mother produces a statement of desire for an antibiotic prescription. In this example, the mother brings the child and states early in the consultation that she would not bring the child in except that

they are taking a trip. In this environment, the mother states her desire that she is “praying” that her son has a bacterial infection and the physician will cure it with antibiotics (line 27-29).

Example 9\_US Statement of desire

```

1  DOC:          Are we ready:.
2  MOM:          Hi: Doctor Sa:nders,
3  DOC:          [W- well hi:. How are you guy:s.=h
4  DOC:          .h[h
5  MOM:          [Well:-
6  DOC:          We have twø victims he[:re.
7  MOM:          [Two victims. We added one when
8                I picked [Sara up from schoo:l.
9  DOC:          [fThat's oka:y?, f
10 MOM:          Actually: we wouldn't be here Doctor Sanders except=h
11 DOC:          You're ta[king the trip. huh huh huh
12 MOM:          - > [I'm looking for: uh uh I'm looking for a
13              - > miracle from you.
14 DOC:          Okay:., heh heh
15 MOM:          - > Martin has: uh his very fir:st major: (.) fi ve year old
16              - > birthday party tomørow,
17              (1.0)
18 MOM:          - > And his temperature's been:=hh UH hundred an FI:VE,
19              ((wail))
20 DOC:          Hi s birthday or is [(he) going tuh huh hah hah hah hah
21 MOM:          - > [Hi s birthday. Tomorrow:. and he's so :
22              - > .sick and I NEED UH MİRACLE! [hhha ha huh huh:
23 DOC:          [ A H : : : [: .
24 MOM:          [fI need
25              a miracle.
26 MOM:          - > .hh I'm h- .hh I know he probably just has thuh common
27              - > cold but I'm like praying he has a horrible bacterial
28              - > infection in his ears and YOU'RE GONNA C:URE IT
29              - > WITH TWQ DOSES OF ANTIBIOTIC [ha ha ha ha ha ha ha ha.
30 DOC:          [Ha ha ha ha ha ha ha ha
31 MOM:          f.hh But I know it's not gonna h(h)appe(h)n.
32 MOM:          .hh f#But I just said (.) you know what, .hh (.) Before
33              I cancel this party, (1.0)
34 DOC:          .hh
35 MOM:          Tlk=[hahhh.
36 DOC:          [#Yeah:,# I- I- i- - hh. I- I'm afraid I can't-
```

As shown in the excerpt, although through various ways, the mother displays that she treats her diagnosis as unlikely, and her desire for antibiotics as subject to the physician's decision, she nonetheless communicates her position as one strongly in favor of antibiotics and puts the physician under pressure to address it (Stivers, 2002a).

I now illustrate caregivers' statements of desire for antibiotic in Chinese pediatric encounters. The caregivers' statements of desires for antibiotic treatment can be sorted into two types: (1) positive-format statements of desire – desire for the treatment, and (2) negative-format

statements of desire – desire not to have a particular treatment. The positive-format statements of desire are more overt in their advocacy, as they explicitly nominate the treatment being advocated for; whereas, the negative-format statements of desire implicitly advocate by resisting and by scalar implicatures, favoring some alternative treatment, similar to caregivers’ negative evaluations of treatment effectiveness. Examples of the two types of statements of desire are provided below.

*(i) Positive-format statements of desire for antibiotic treatment*

As mentioned above, the caregiver’s positive-format statements of desire directly nominate the advocated antibiotic treatment. In this example, the child is visiting for a stomachache and headache. Prior to the visit, she has coughed for a few days, and the caregiver has given her oral antibiotics and cough syrup for five days. The physician conducts a physical exam of the child’s throat and reports that the child’s throat is a little red. At line 1, the physician suggests the patient take a diagnostic blood test. The grandmother accepts the test recommendation (line 3 to 7). After some discussion of the child’s age (line 8), as the caregivers and the child are getting ready to leave for the blood test, the grandmother states her desire for IV drip treatment at line 9.

Example 10\_05\_0917\_20

Condition: Coughing

D: Doctor, GM: Grandmother

- 1 D: 查个指头血?  
cha ge zhitou xue  
examine PT finger blood  
Take a finger blood test?
- 2 (0.5)
- 3 GM: 行呢行呢。这个要呢。  
xing ne xing ne zhege yao ne  
alright PT alright PT this need PT  
Alright, alright. This is needed.
- 4 P: 指头血?  
zhitou xue  
finger blood  
Finger blood?
- 5 D: 对。  
dui  
right  
Right.
- 6 ((5 lines of discussion of patient age omitted))
- 7 GM: 好, 谢谢哦。  
hao xiexie o



ok thanks PT  
 Ok. Thanks.  
 8 ((Caregivers and patient getting ready to leave the room))  
 9 GM: 哎，这个不能呆噢，  
 ai zhege bu neng dai o  
 yeh this can't stay PT  
 一开始就要挂，  
 yikaishi jiu yao gua  
 beginning just need drip  
 像这种小把戏哦，  
 xiang zhezhong xiaobaxi o  
 like this little-kid PT  
 正常吃药都吃不好。  
 zhengchang chiyao dou chi bu hao  
 normal eat medicine all eat not well  
 Yeh, this can't wait.  
**(He) has to have IV drip at the very beginning.**  
 Little kid like him,  
 Oral medication normally wouldn't work.  
 10 D: 上中班了哎？  
 shang zhong ban le ai  
 go middle class PT PT  
 (She) goes to middle class (in kindergarten)?  
 11 GM: 大班。  
 da ban  
 senior class  
 Senior class.  
 12 D: 大班应该好点了哎。  
 da ban yinggai hao dian le ai  
 senior class should well a-little PT PT  
 Senior class, she should be better.

In her statement, the grandmother first explicates her desire for IV drip treatment; in addition, she also rationalizes her desire by stating that young children of this kind could not normally get well with oral medication (line 9). As shown in this example, even before the blood test is conducted, the grandmother states outright her desire for treatment. In response, the physician resists the grandmother's rationalization that the patient is not old enough to get well with oral medication and the embodied advocacy for the IV drip treatment (lines 10 and 12).

Example 11 illustrates another example of caregivers' positive-format statements of desires for antibiotic treatment. In this example, the child is visiting for coughing that has lasted the past two days. After a physical examination, the physician informs them that there is no sign of pneumonia (not shown in the excerpt). After this, the physician recommends the patient have oral treatment (line 1). In response, the caregiver states a desire for drip treatment (on behalf of another caregiver) at line 2.

Example 11\_07\_1125\_16

Condition: coughing for two days

- 1 D : 怎么弄啊 ?  
zenme nong a  
how do PT  
先吃点个药好吧 ? =  
xian chi diange yao hao ba  
first eat a-little medicine good PT  
'What shall we do?  
*Take some oral medicine first, ok?'*
- 2 GF : = 他妈说给他输液 .  
ta ma shuo gei ta shu ye  
he mother say give transfuse liquid  
'**His mother said put him on drip.**'
- 3 D : 啊 ? 要挂水啊 ?  
a yao gua shui a  
PT want hang water PT  
'Huh? Want drip?'
- 4 GF : 她说挂水也压不下去 ,  
ta shuo gua shui ye ya bu xiaqu  
she say hang water also suppress not down  
还要重挂 .  
hai yao chong gua  
still again hang  
'She said even drip doesn't work.  
(He'll) still have drip again.'
- 5 D : 要 - 要挂水 ?  
yao yao gua shui  
want  
'Want- want drip?'
- 6 GF : 上次挂的阿奇 , 换一个行吧 ,  
shang ci gua de Aqi huan yi-ge xing ba  
last time hang PT Azith change one fine PT  
'He had Azith last time? (Can we) change one, ok?'
- 7 D : 挂头孢好吧 ?  
gua toubao hao ba  
hang Cephalo good PT  
'(Have) Cephalo for drip, ok?'
- 8 GF : 嗯 .  
en  
yeah  
'Yeah.'

Although the caregiver does not present the desire for IV drip treatment as his own, but rather the patient's mother's, thus reducing the forcefulness of the advocating action; nonetheless, it clearly conveys a general desire for that treatment, just like a statement of desire of one's own. In response, the physician resists the caregiver's treatment advocacy with an understanding check as to whether the caregiver wants to put the patient on drip treatment (line 3). This thus displays that the physician is put into the position of addressing the caregiver's treatment advocacy in the face of the caregiver's statement of desire, even though a statement does not require a subsequent response.

*(ii) Negative-format statements of desire*

Caregivers' negative-format statements of desire explicate their preference against some particular treatment; by scalar implicature, they are understood as advocating for some alternative 'stronger' treatment. For instance, a dispreference for oral medication is usually understood as a preference for IV drip treatment. Therefore, they are less direct than positive-format statements of desire for antibiotic treatment and are sometimes used together with the positive-format statements. Example 12 illustrates a case.

In this example, the caregiver complains that the child has been coughing for more than a week. The caregiver has used oral antibiotics and cough syrup for the child prior to the visit. After a physical examination, the physician reports that the child has some phlegm, and his throat is also a little red. The patient is then recommended to take a blood test. After returning from the test, the result finds no problem, and the physician prepares to make a treatment recommendation for the patient (not shown in the excerpt). At line 1, she first makes a positive comment on the patient's energy level; she then delivers a treatment recommendation in which she first acknowledges the patient's treatment history, that IV drip has been routinely used in the past; she then asks if the patient would like to take oral medication this time (line 3). In response, the grandfather states a preference against the oral medication treatment (line 4). Note that like evaluations of treatment effectiveness, statements of desire can be produced either in a sequence-responding position, as a reaction to the physician's inquiry, or a sequence-initiating position (e.g., Example 10 and Example 11). In this case, the caregiver's statement of desire is produced in the sequence-responding position. Details of the distinction between caregivers' statements of desire produced in sequence-responding positions versus sequence-initiating positions will be discussed later.

Example 12\_05\_0922\_10

Condition: Coughing

D: Doctor, GM: Grandmother

1 D: 哎，精神现在还好。

ai jinshen xianzai haihao  
yeh spirit now ok  
'Yeh, (his) spirit is ok now.'

2 GM: 哎。  
ai  
yeh  
'Yeh.'

3 D: 你每次都挂水的啊？  
ni mei ci dou guashui de a  
you every time all drip PT PT  
你吃点药，怎么样啊？  
ni chi dian yao zenmeyang a  
you eat some medicine how PT  
'You have drip every time?  
You take some oral medication, how about that?'

4 GF: 药，他不想吃药。  
yao ta bu xiang chi yao  
medicine he not want eat medicine  
'**(Oral) medicine, he doesn't want to take oral medicine.**'

5 GM: 挂水。  
gua shui  
drip  
'(He wants to) have drip.'

6 D: 挂水是啊？  
guashui shi a  
drip is PT  
'Drip, is it?'

7 GM: 挂 - 挂水快一点。  
gua guashui kuai yidian  
drip drip fast a-little  
'Drip, is faster.'

8 D: 好呢，行呢。那就给你挂吧。  
hao ne xing ne na jiu gei ni gua ba  
ok PT alright PT then just give you drip PT  
'Ok. Alright. Then (I'll) just put you on drip.'

Since the negative-format evaluations rely on scalar implicature for the understanding of the treatment advocacy, a positive-format can be used as an escalation of treatment advocacy following the negative-format desire statement. This can be seen in this example, following the grandfather's negative statement of desire for oral medication (line 4), the grandmother states a positive desire for IV drip (line 5). Subsequently, the physician concedes to offer the IV drip (line 8).

A similar case of a caregiver's negative-format desire statement for oral treatment is illustrated in Example 13. In this example, the child is diagnosed with a bronchitis after an X-ray examination. The father first asks the physician if the patient needs an IV drip (line 3). With some delay in response (lines 4 and 5), the physician recommends that the patient take oral medication, if

he has not taken oral medication regularly yet (line 6). Receiving no uptake from the father, the physician pursues the father's acceptance of the oral treatment recommendation (lines 8 and 11).

Example 13\_05\_0929\_03

Condition: Coughing, fever

F: Father, D: Doctor

- 1 F: 支气管炎 .  
zhiqiguanyan  
bronchitis  
'Bronchitis.'
- 2 ( 19.5 )
- 3 F: 这 要 挂水 吧 ?  
zhe yao guashui ba  
this need drip PT  
'Does this need drip?'
- 4 ( 2.0 )
- 5 ((Doc writing on medical records))
- 6 D: 支气管炎 ,  
zhiqiguanyan  
bronchitis  
如果你 前面 没有 好好 吃 药 呢 ,  
ruguo ni qianmian meiyou haohao chi yao ne  
if you previously not well eat medicine PT  
也 可以 从 吃 药 开始 .  
ye keyi cong chi yao kaishi  
also can from eat medicine start  
'Bronchitis, if you didn't take oral medication regularly,  
you can also start from taking oral medication.'
- 7 ( 0.9 )
- 8 D: 你 好像 就 吃 过 鱼腥草 , 是 吧 ?  
ni haoxiang jiu chi guo yuxingcao shi ba  
you probably just eat PT yuxingcao is PT  
'You seem to have taken Yuxingcao, do you?'
- 9 F: 对 .  
dui  
right  
'Right.'
- 10 ( 2.0 )
- 11 D: 吃 药 不 行 的 话 , 要 挂 , [除非 你 -  
chi yao bu xing dehua yao gua chufei ni  
eat medicine not work case need drip except you  
'If oral medication doesn't work, (he) needs drip, except you'
- 12 M : [他 不 肯 吃 药 ,  
ta bu keng chi yao  
he not willing eat medicine  
[ 别 的 不 肯 吃 ,  
biede bu keng chi  
else not willing eat  
除 了 鱼腥草 还 能 吃 吃 .  
chule yuxingcao hai neng chi chi  
except yuxingcao still can eat eat  
'He's unwilling to take oral medication,  
anything else, except that Yuxingcao, he could still take some.'
- 13 D: [ 不 肯 吃 啊 .  
bu keng chi a  
not willing eat PT  
哦 , 不 肯 吃 药 , 你 就 挂 水 .  
o bu keng chi yao ni jiu guashui  
ok not willing eat medicine you just drip

*'Unwilling to take (oral medication)?  
Ok. (If he's) unwilling to take medicine. You just have IV drip.'*

At line 11, when the physician brings up the possibility that the oral medication will not work, the mother states in overlap with the physician's ongoing utterance that the patient isn't willing to take oral medication at line 12. Upon receiving this statement of desire not to have oral medication, the physician concedes to offer IV drip treatment to the caregiver.

In sum, the caregivers' statements of desire explicitly display the caregivers' stances toward a particular treatment – the positive desire statements communicate the caregivers' preference for a particular antibiotic treatment, and the negative-format desire statements, by scalar implicature, communicate a desire for alternative treatments.

Relative to other types of advocacy, statements of desire for antibiotics in the Chinese data are more common than in the US. They are observed in 7% of the Chinese pediatric encounters, in a total of 21 instances. Among these instances of caregiver desire statements, the positive desire statements are more predominant, occurring 55% (n=12) of the time; whereas the negative desire statements occur 45% (n=9) of the time.

In addition, it should be noted here that in statements of desire, caregivers primarily appeal to their desire or patient desire for some particular treatment<sup>9</sup> (over which the caregivers have the primacy in authority), rather than the need or necessity of the treatment. This is in contrast with caregivers' evaluations of treatment effectiveness and inquiries as to the physician's view of treatment (over which the physicians have the primacy in authority). In this sense, the caregivers' statements of desire for antibiotic treatment display a higher level of agency in their action implementation and put physicians under a greater amount of normative pressure to respond to

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<sup>9</sup> In caregivers' statements of desire for antibiotic treatment, they appeal to their own desire for antibiotic treatment 55% of the time, as compared to 45% for patients' treatment desires.

their treatment advocacy. As shown in the examples above (e.g., Example 12 and Example 13), physicians almost always respond to this kind of treatment advocacy by abandoning their original treatment recommendation and changing to offer the treatment being advocated for.

#### *(4) Explicit requests for antibiotic treatment*

Lastly, an explicit request for antibiotic treatment constitute the fourth type of overt advocating action. As Stivers (2002a) finds, requests are the most direct form of overt pressure, since they both assert a parent's preference for antibiotics and obligate the physician to respond to the request. Given their overt implementation of pressure, only in very rare cases do parents use explicit requests to advocate for antibiotic treatment in American pediatric encounters (Stivers, 2002a); whereas in Chinese pediatric encounters, explicit requests for antibiotic treatment were observed in 6% of the acute visits (n=10). Although they were the least common way that caregivers advocated for antibiotic treatment, they were relatively more common in the Chinese pediatric context, as explicit requests were observed in less than 1% of the visits in the American context (Stivers, 2002a).

The following excerpt illustrates a case of a parent's explicit request in the American context (data and analysis from Stivers, 2002a). In this example, the doctor diagnoses the girl with conjunctivitis. In the interaction before the shown excerpt, the mother has inquired about whether the child needs treatment for a condition similar to "sinusitis", indexing a need for antibiotics. In response, the physician recommends against antibiotics (lines 1-3) but for decongestant (lines 4-5) to treat the child's eyes. In this environment, the mother begins to speak explicitly about antibiotics.

Example 15\_US Explicit request

(1) 2019 (Dr. 6)

1 DOC: .hh So: uh:m a- at this time I don't wanta commit 'er to:  
2 antibiotics.

3 DOC: Like two weeks, or three weeks, or whatever:?

4 DOC: .h I thi:nk I'll go ahead and treat her for the eye:s?,  
5 an' I wanta give her some decongestant.

6 DOC: Uh:m, .hh- Ya know i- She doesn't look like uh:m (.)  
7 Why don't we go ahead and try the decongestant first.

((26 lines of discussion of treatment not shown))

34 MOM: <I mean I usually don't- I- I usually wait to bring  
35 her in at least until [( ).  
36 DOC: [You wait unti- Yeah:,  
37 DOC: .hhh Uh: [m-  
38 MOM: [Cuz it's such a big deal to come here [( )

39 DOC: [Yea:h,=h  
40 I mean: if you wa :nt ya know- I mean she looks.=  
41 MOM: - > =Can I at least have thuh prescription an' I'll decide  
42 - > whether or not to fill it in a couple day:s,  
43 DOC: For the antibiotics?  
44 MOM: Ye[ah.  
45 DOC: [Uh::m. I really don't like to do tha:t,  
46 because: I mean .hh She doesn't look like she has  
47 sinusitis:. Ya know?, Uhm, if you really wanta be  
48 su :re we can go ahead and take: x rays to make  
49 su:re if it's really opacify:, cause unnecessary

After some preparatory work – presenting herself as troubles-resistant (Jefferson, 1988) (lines 34/35, 38), the mother produces the request for antibiotic prescription (lines 41-42). Although the mother's request is produced with some delicacy in its design – treating it as a minimal form of action that is significantly less than treating the child, and claims some measure of discretion, the physician treats the request as a form of pressure, and thus resists the request in several ways in lines 45-49 (e.g., seeking clarification of the requested item, providing X-ray examination as an alternative future action, and explaining the rationale to avoid inappropriate prescribing).

I now illustrate caregivers' explicit requests in Chinese pediatric encounters. In Example 16, the child's primary complaint is a cough. In data not shown in this excerpt, the patient has taken a blood test, and the test shows that the result is a little problematic, yet not very bad. The physician thus recommends treating the child with oral medication. The grandmother agrees to this treatment



proposal. The two parties then proceed to decide what specific oral medication to prescribe. The physician suggests some non-antibiotic medicine including *Yuxingcao*<sup>10</sup> and an antipyretic. The grandmother accepts these prescription recommendations. As the physician is wrapping up the treatment stage and getting ready to move toward the consultation end (line 1), the grandmother initiates a repair of the physician's turn (line 2), resisting the physician's action to exit. Following the physician's confirmation that the recommended medicine is enough (line 3), the grandmother brings up the child's fever symptom, again resisting the consultation's trajectory towards a conclusion (line 4). In response, the physician suggests the patient drink more fluid for his fever (lines 5 & 7). In this environment, the grandmother produces an explicit request for antibiotic medicine (line 8).

Example 16\_06\_0920\_14

Condition: cough, fever

D: Doctor, GM: Grandmother, GF: Grandfather

- 1 D: 好吧? 就行了哎, 就行了。  
hao ba? jiu xing le ai, jiu xing le.  
good PT just ok PT PT just ok PT  
'Ok? Then that's ok. That's ok.'
- 2 GM: 那个 就行啦?  
nage jiu xing la?  
that just ok PT  
'That is just ok? '
- 3 D: 哎 哎 哎. 我 给你-  
ai ai ai. wo gei ni-  
yeh yeh yeh I give you  
那 这 次 不 一 定 配 了。  
na zhe ci bu yiding pei le.  
then this time not definitely prescribe PT  
你 鱼 腥 草 蒲 地 兰 吃 一 个 就 可 以 了。  
ni Yuxingcao Pudilan chi yige jiu keyi le.  
you Yuxingcao Pudilan eat one just ok PT  
Yeh, yeh, yeh. I gave you-  
'Then this time it's not necessary to prescribe it.  
*Yuxingcao or Pudilan*<sup>11</sup>, you can just take one of them.'
- 4 GM: 他- 他 有 点 发 烧 的 呀,  
ta- ta youdian fashao de ya,  
he he have some fever PT PT  
'He- he has a little fever,'
- 5 D: 低 烧, 低 烧 多 喝 水, 哦,  
di shao, di shao duo he shui, ok,  
low fever low fever more drink water PT  
'Low fever, low fever, drink more water, ok?'
- 6 GM: 哦:, 多 喝 水。  
o:, duo he shui.  
ok more drink water

<sup>10</sup> *Yuxingcao*: A Chinese anti-inflammatory medicine.

<sup>11</sup> Both *Yuxingcao* and *Pudilan* are Chinese anti-inflammatory medicine.

7 D: 'Ok, drink more water.'  
 哎 哎.  
 ai ai .  
 yeh yeh  
 'Yeh, yeh.'

8 GM: 再配点消炎药.  
 zai pei dian xiaoyan yao.  
 again prescribe some antibiotic medicine  
 '**Also prescribe some antibiotic medicine.**'

9 D: 头孢了哦, 消炎药.  
 toubao le e, xiaoyan yao.  
 Cephalo PT PT antibiotic medicine  
 '(Then that's) Cephalo, ok? Antibiotic medicine.'

10 GM: 哦..  
 o:..  
 ok  
 'Ok.'

11 D: 你要开点那个- 那个,  
 ni yao kai dian nage- nage,  
 you demand prescribe some that that  
 要么开一盒头孢给你吧.  
 yaome kai yi he tou bao gei ni ba.  
 or prescribe one pack Cephalo to you PT  
 实在说不行你就吃两天  
 shizai shui bu xing ni jiu chi liang tian  
 indeed say not work you just eat two day  
 头孢吧, 好吧?  
 toubao ba, hao ba?  
 Cephalo PT good PT  
 'You want to be prescribed some of that- that,  
 Or (I'll) prescribe one pack of Cephalo to you, ok?  
 If it really didn't work, then you take two-day Cephalo, ok?'

12 GM: 好.  
 hao.  
 good  
 'Ok.'

Since the physician has indicated that the recommended medicine is already enough, and that the additional symptom (low fever) can be addressed by drinking more fluid, the grandmother's request for additional antibiotic medicine thus directly counters the physician's stance, and thereby puts the physician under pressure to prescribe oral antibiotic medication.

The physician also displays herself as under pressure for prescribing in face of such overt treatment advocacy. She first seeks the grandmother's confirmation that what she requests is Western antibiotic medicine (*Cephalo*) in line 9, thus resisting the grandmother's request by providing her another opportunity to retreat from her stance – since the caregivers' requested item '*xiaoyan yao*' is a vernacular name used for both Western antibiotics and Chinese anti-inflammatory medicine, and the caregiver has already requested once and are responded to by the physician with a prescription

for Chinese anti-inflammatory medicine, the physician is producing an understanding check as to whether the caregiver means Western antibiotics (*Cephalo* being one of them). Moreover, although she concedes to prescribe oral antibiotics, her recommendation is nonetheless designed as a contingency plan (Mangione-Smith et al., 2001) – ‘*If it really didn’t work, then you take two-day Cephalo, ok?*’ It thus reclaims some degree of the physician’s authority in making treatment decisions, yet it also gives the caregiver a great amount of discretion in using antibiotics.

Example 17 illustrates another case of a caregiver’s explicit request for antibiotics. The explicit request is similarly produced in an environment where the caregiver and the physician have reached an agreement on the primary treatment regime for the child (IV drip treatment), and the caregiver requests that the physician prescribe some oral antibiotics. In this example, the patient’s primary complaint is fever, with some presence of coughing and sore throat over the previous two days. The physician suggests a blood test for the patient, and the test returns a slightly problematic result, and a bacterial infection diagnosis is thus implied (line 1). The caregiver first inquires as to whether IV drip treatment is necessary (line 4), the physician confirms it and further offers to treat the patient with IV drip (lines 5 & 7). In this environment, the mother issues a request for an additional prescription of oral antibiotics (lines 9/11).

Example 17\_07\_1125\_25

Condition: Fever, Coughing, sore throat

D: Doctor, M: Mother

- 1 D: 血象高了啊，一万四千多呢。  
 xuexiang gao le a yiwansiqian duo ne  
 hemogram high PT PT 14000 more PT  
 ‘(His) hemogram is high. Over 14000.’
- 2 M: 四千啊？  
 siqian a  
 4000 PT  
 ‘4000?’
- 3 D: 嗯。  
 en  
 yeah  
 ‘Yeah.’
- 4 M: 要挂水吧？  
 yao guashui ba  
 need drip PT  
 ‘Need IV drip?’
- 5 D: 哎，最好挂水吧。

ai zuihao guashui ba  
 yeh best drip PT  
 因为你 也 在家 吃药 了 是 吧 ? =  
 yinwei ni zai jia chiyao le ne shi ba  
 because you also at home eat medicine PT is PT  
 'Yeah, it's best to have drips.  
 Because you also had oral medicine at home, did you?'

6 M: = 哎 , 吃 药 了 。  
 ai chi yao le  
 yeh eat medicine PT  
 'Yeh. (We) had oral medicine.'

7 D: 血 象 高 , 我 还 是 建 议 你 挂 水 。  
 xuexiang gao wo haishi jianyi ni guashui  
 hemogram high I also suggest you drip  
 'The hemogram is high. I still suggest you have drips.'

8 M: 嗯 。  
 en  
 yeah  
 'Yeah.'

((9 lines discussion about the length of the IV drip treatment omitted))

9 M: 你 再 开 点 儿 药 。  
 ni zai kai dianer yao  
 you also prescribe some medicine  
 '**Also prescribe (us) some (oral) medicine.**'

10 D: 哦 。  
 o  
 ok  
 'Ok.'

11 M: 消 炎 药 。  
 xiaoyanyao  
 antibiotics  
 '**Antibiotics.**'

12 D: 消 炎 药 你 现 在 挂 水  
 xiaoyanyao ni xianzai guashui  
 antibiotics medicine you now drip  
 就 不 要 再 吃 了 。  
 jiu buyao zai chi le  
 then don't again eat PT  
 'You are having drips,  
 (so) you don't need to take (oral) antibiotics.'

13 M: 哦 , 消 炎 药 挂 水 就 不 吃 了 。  
 o xiaoyanyao guashui jiu bu chi le  
 ok antibiotics drip then not eat PT  
 'Ok. (If he) has drips, (he) doesn't need to take (oral) antibiotics.'

14 D: 嗯 。  
 en  
 yeah  
 'Yeah.'

The request is formulated first as a request for oral medication generally (line 9); it is then appended with an increment, specifying the type of oral medication being requested – oral antibiotics (line 11). In response, although the physician does not concede to offer the requested oral antibiotics, her response displays herself as under pressure – apart from denying the request, she also

accounts for her denial with a rationale as to why the oral antibiotic prescriptions are not offered to the patient (line 12).

In sum, explicit requests are the most overt form of advocating action among the four action types. What primarily distinguishes this action from the other three is that it presents the prescription decision as not requiring the physician's endorsement – both in the sense that caregivers claim a high degree of agency and epistemic independency as to what is the best course of treatment for the child's condition, and in the sense that they display a high level of entitlement to receive the prescriptions.

As a high-stakes social action, caregivers' explicit requests occur the least frequently in the consultations among the four overt advocating actions; however, compared to the American pediatric encounters, this action is still more frequently observed in the Chinese encounters (6% vs. 1%). Given the higher frequency and high level of agency and entitlement displayed in the implementation of the requesting action, Chinese caregivers put physicians under greater pressure for over-prescribing than their American counterparts.

In summary, in this section, I illustrated the four types of overt advocating actions that caregivers in these data use to communicate their desire for antibiotic prescriptions in pediatric interactions. These actions, although varying in their overtness and imposition on physicians' actions in their turn design, display caregivers' overall high level of agency and entitlement in antibiotic treatment decisions, putting physicians under a substantial amount of pressure for prescribing. Moreover, when compared to caregivers' behavior in the American system, it is found that caregivers in the Chinese context not only use these overt advocating actions much more frequently, but also format them more strongly and with more agency in their turn design.

Besides the turn design features of the overt advocating actions, one additional piece of evidence to support the argument that caregivers display higher level of agency and entitlement in

the Chinese pediatric context is the local sequential placement of the actions. In the following section, I turn to illustrate the local sequential positions of the overt advocating actions and what they show with regard to the caregivers' agency and entitlement.

### 3.3.2.2 Caregiver agency and entitlement: Local sequential position of advocating actions

In this section, I focus on the local sequential placement of caregivers' advocating actions as an additional support for the argument that the caregivers in the Chinese pediatric context display a high level of agency and entitlement in their advocacy for antibiotic treatment. Specifically, I show that the four types of caregivers' overt advocating actions that I described above are predominantly produced in sequence-initiation positions, rather than sequence-responding positions.

Being produced in a sequence-initiating position refers to that an overt advocating action is produced on the initiative of the caregiver, as opposed to being solicited by the physicians, in which case it is produced in a sequence-responding position. Among the four types of overt advocating actions, explicit requests and inquiries about antibiotic treatment are always produced in sequence-initiating positions; whereas statements of desire for antibiotic treatment and evaluations of treatment effectiveness can be produced in either sequence-initiating or sequence-responding positions.

In the following, I first illustrate examples of caregivers' statements of desire for antibiotic treatment and evaluations of treatment effectiveness that are produced in sequence-initiating positions and sequence-responding positions; I then compare their relative frequency in my data set. Example 18 and Example 19 are examples of caregivers' statements of desire for antibiotics produced in the sequence-responding position and sequence-initiating position, respectively; Example 20 and Example 21 are examples of caregivers' evaluations of treatment effectiveness in the sequence-responding and sequence-initiating positions, respectively.

(i) *Statements of desire for antibiotic treatment: sequence-responding position*

As mentioned briefly earlier, caregivers' statements of desire for antibiotic treatment can be produced in either sequence-responding positions or sequence-initiating positions. In other words, they can be either solicited by physicians' invitations or produced on the caregivers' own initiative. Example 18 illustrates a case in which the caregiver's statement of desire is produced in the sequence-responding position (line 4).

Example 18\_05\_0922\_10

- 1 D: 哎，精神现在还好。  
ai jinshen xianzai haihao  
yeh spirit now ok  
'Yeh, (his) spirit is ok now.'
- 2 GM: 哎。  
ai  
yeh  
'Yeh.'
- 3 D: 你每次都挂水的啊？  
ni mei ci dou guashui de a  
you every time all drip PT PT  
你吃点药，怎么样啊？  
ni chi dian yao zenmeyang a  
you eat some medicine how PT  
'You have drip every time?  
You take some oral medication, how about that?'
- 4 GF: 药，他不想吃药。  
yao ta bu xiang chi yao  
medicine he not want eat medicine  
'(Oral) medicine, he doesn't want to take oral medicine.'

As shown in the excerpt, the caregiver's statement of desire for IV drip treatment is produced in an environment where the physician invites the caregiver to indicate the caregivers' opinion about the treatment. In the sense that the statement just provides what is being required by the physician, caregivers' statements of desire of this kind are treated as produced in the sequence-responding position. A contrastive case in which a caregiver's statement of desire is produced in the sequence-initiating position is illustrated below.

(ii) *Statements of desire for antibiotic treatment: sequence-initiating position*

In this example, the caregiver's statement of desire for IV drip treatment (line 9) is produced in an environment where the patient and caregiver are exiting the room for a blood test (lines 7-8).

Example 19\_05\_0917\_20 [same with Example 10]

1 D: 查个指头血?  
cha ge zhitou xue  
examine PT finger blood  
'Take a finger blood test?'

2 (0.5)

3 GM: 行呢行呢。这个要呢。  
xing ne xing ne zhege yao ne  
alright PT alright PT this need PT  
'Alright, alright. This is needed.'

4 P: 指头血?  
zhitou xue  
finger blood  
'Finger blood?'

5 D: 对。  
dui  
right  
'Right.'

6 ((5 lines of discussion of patient age omitted))

7 GM: 好, 谢谢哦。  
hao xiexie o  
ok thanks PT  
'Ok. Thanks.'

8 ((Caregivers and patient getting ready to leave the room))

9 GM: 哎, 这个不能呆噢,  
ai zhege bu neng dai o  
yeh this can't stay PT  
一开始就要挂,  
yikaishi jiu yao gua  
beginning just need drip  
像这种小把戏哦,  
xiang zhezhong xiaobaxi o  
like this little-kid PT  
正常吃药都吃不好。  
zhengchang chiyao dou chi bu hao  
normal eat medicine all eat not well  
'Yeh, this can't wait.'  
(He) has to have drips at the very beginning.  
Little kid like him,  
Oral medication normally wouldn't work.'

Without any invitation from the physician, the caregiver states her desire for IV drip while she is exiting the room. Although the statement does not explicitly make relevant a physician's response on the next sequentially, it nonetheless puts the physician under normative pressure to address such a treatment preference. Given that the physician has not delivered the diagnosis or



initiated any discussion about treatment plan, the caregiver's statement of desire for the IV drip treatment display a high level of agency and assertiveness.

In sum, caregivers' statements of desire can be produced either in the sequence-responding position or in the sequence-initiating position; when they are produced in the sequence-initiating position, they demonstrate a much higher degree of caregiver agency and assertiveness in the treatment advocacy, compared to those in the sequence-responding position.

*(iii) Evaluations of treatment effectiveness: sequence-responding position*

Example 20 shows an example of a caregiver's evaluation of treatment effectiveness in the sequence-responding position. In this example, the patient is brought in for coughing for two days. After a physical examination, the physician starts to take the patient's medication history. Following the physician invitation to evaluate the oral medication used prior to the visit (line 2), the two caregivers each produce a negative evaluation of the oral medication (line 3 and line 4), which are understood by the physician as advocating for IV drip antibiotic treatment (line 5).

Example 20\_05\_0919\_11

- 1 ((医生处理病历))  
((physician processing medical records))
- 2 D: 你这两天觉得吃的药有用吗?  
ni zhe liang tian jue de chi de yao youyong ma?  
you these two day feel eat PT medicine effectice PT  
'Do you think the medication worked these two days?'
- 3 F: 好像: [效果: 不是那么明显的。  
haoxiang: [xiaoguo: bu shi name mingxian de.  
seems effect not is that obvious PT  
'(It) seems that the effect wasn't that obvious.'
- 4 M: [效果不太明显。  
[xiaoguo bu tai mingxian.  
effect not too obvious  
'The effect wasn't very obvious.'
- 5 D: °嗯。° 那你这个, (.) 想挂点水啊?  
°en.° na ni zhege, (.) xiang gua dian shui a?  
yeah then you this want have some drip PT  
'Yeah. Then you wanna have some drip?'
- 6 (1.0)
- 7 F: 能挂水就挂点水吧。  
neng guashui jiu gua dian shui ba.  
can have drip then have some drip PT  
'If (he) can have drip, then let's have some drip.'

8 D: 嗯.  
 en.  
 yeah  
 'Yeah.'

This case thus shows that a caregiver's evaluation of treatment effectiveness can be produced as a reaction to a physicians' invitation. When caregivers are invited to contribute their opinions about treatment, they are put in a strong position to advocate for IV antibiotics, as the physician displays a willingness to incorporate the caregivers' opinions of the treatment. Caregivers' evaluations of this sort are therefore considered and coded as occurring in a sequence-responding position, distinguishing them from the ones produced without a physician's solicitation, as shown in the following example.

*(iv) Evaluations of treatment effectiveness: sequence-initiating position*

In this example, the patient is recommended to take oral medication for his cough and fever. In this interactional environment, the caregiver produces a negative evaluation of the recommended oral medication (line 2).

Example 21\_07\_1125\_14 [same with Example 1.1]  
 Symptoms: fever, cough (not definitely)  
 D: Doctor, GM1: Grandmal, GM2: Grandma2; P: Patient

1 D: 实际上啊,你 这个  
 shijishang a, ni zhege  
 actually PT you this  
 还是要继续吃药.  
 haishi yao jixu chi yao.  
 still need continue eat medicine  
 'Actually, with this (hemogram), you still need to go on  
 taking (oral) medicine. '

2 (.)

3 D: [你 这个 血象 啊-  
 [ni zhege xuexiang a-  
 you this hemogram PT  
 'Your hemogram, '

4 GM1: [没的 用 诶,  
 [meide yong ei,  
 not working PT  
 我们吃药吃不住哎,  
 women chi yao chi bu zhu ai,  
 we eat medicine eat not down PT  
 'It won't work.'  
 Taking oral medication can't bring it down for us.'

As shown in the excerpt, the caregiver's negative evaluation of the oral medication treatment is produced in an environment where the physician is recommending the patient take oral medication (line 1), and this treatment recommendation makes relevant the caregiver's subsequent acceptance (Stivers, 2005). Rather than accepting the oral medication treatment, the caregiver evaluates the recommended treatment and thus suspends the progressivity of the sequence by initiating a new sequence about the effectiveness of the treatment.

Although the evaluation does not explicitly 'require' a response on the next, it nonetheless puts the physician under normative pressure to address the negative assessment, similar to parents' *'narrative expansions'* to physicians' comprehensive history-taking questions in which they break through the sequential mold of the prior talk to launch some new projects (Stivers & Heritage, 2001).

Thus, in the sense that the caregiver does not fulfill the sequential constraint created by the physician's prior turn, and that the evaluation of the treatment is not produced as a reaction to the physician's invitation as the one in Example 19, caregivers' evaluations of treatment effectiveness of this kind are considered to be produced in sequence-initiating position.

In addition, given that evaluations of treatment effectiveness in the sequence-initiating position are produced completely on the caregivers' own initiative, and that evaluating treatment effectiveness is perceivably a direct challenge to the physician's medical authority, caregivers' evaluations of the treatment produced in the sequence-initiating position display a higher level of agency and assertiveness in treatment decision-making than those in the sequence-responding position.

I now turn to the relative frequency of caregivers' overt advocating actions produced in these two types of local sequential positions. Table 3<sup>12</sup> shows the frequency of caregivers' overt advocating actions that are produced in sequence-initiating positions and sequence-responding positions.

**Table 3-3.**  
**Local Sequential Placement of Overt Advocating Actions (by number of actions) (N=139)**

<b>Action Type</b>	<b>Sequence-Initiating</b>	<b>Sequence-Responding</b>	<b>Total Number of Actions</b>
<b>Evaluations of Treatment Effectiveness</b>	21	17	38
<b>Inquiries about Antibiotic Treatment</b>	64	0	64
<b>Statements of Desire for Antibiotic Treatment</b>	12	10	22
<b>Explicit Requests for Antibiotic Treatment</b>	15	0	15
<b>Total Number of Actions</b>	112 (81%)	27 (19%)	139 (100%)

The results reveal that although in some cases physicians invite caregivers to display their views about treatment preference, the overt advocating actions are initiated by caregivers 81% of the time. Given that caregivers' advocating actions produced in the sequence-initiating position display a higher level of agency and assertiveness than those in the sequence-responding position, this adds to our accumulation of evidence that Chinese caregivers present themselves as having a high level of agency and entitlement in antibiotic treatment negotiation, and this thus provides further evidence that the demand-side factors (i.e., caregiver desires and behaviors) play a strong role in antibiotic over-prescription in China.

Despite the high level of agency and entitlement displayed in the caregivers' verbal design and local sequential placement of the overt advocating actions, it should be noted that these actions

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<sup>12</sup> Note that Table 3 shows all caregivers' overt advocating actions in the data set. Since caregivers might use more than one overt advocating actions in a single visit, Table 3 shows a total of 139 overt advocating actions taken by caregivers observed in a total of 100 visits.

do not seem to occur with equal frequency in all phases of the medical consultation. It thus poses the questions (1) In what interactional context do caregivers usually produce these overt advocating actions? (2) How is the use of the overt advocating action format related to its sequential placement in the consultation? and (3) What does it show about the caregivers' orientation toward physicians' authority and the physician-caregiver relationship more generally? I investigate these questions in the following section.

### 3.3.2.3 Caregiver deference to medical authority: Global sequential position of advocating actions

In this section, I now turn to examine the global sequential placement of caregivers' overt advocating actions, specifically, the position of their occurrence in the overall organization of the pediatric encounters. I show that (1) caregivers' overt advocating actions tend to occur later in the encounters; and (2) relatively more overt form of advocating actions tend to occur later in the encounters. The global sequential placement of the caregivers gives evidence that caregivers still defer to physicians' authority, despite displaying a high level of agency and entitlement in antibiotic treatment decisions. This thus suggests that caregivers orient to their rights in treatment decision making as shared with the physicians – a significant yet not complete departure from the paternalistic doctor-patient relationship.

To analyze the global sequential placement of the overt advocating actions, the actions are coded by the phase of the consultation in which they are produced. The overall phase structure of the medical consultations follow that of primary care consultations proposed by (Byrne & Long, 1976) and Robinson (2010), including: 1) problem presentation, 2) history-taking, 3) physical examination, 4) diagnosis, 5) treatment decision, and 6) closing. Table 4 describes the distribution of the caregivers' overt advocating actions across the six phases on the consultations. To examine

whether caregivers tend to use more overt advocating actions in later phases of the consultations, the six consultation phases are divided into two types, *earlier* (phases 1-3), and *later* (phases 4-6)

Table 3-4 illustrates the distribution of caregivers’ overt advocating actions by the six types of global sequential positions. Note that, like Table 3-3, Table 3-4 presents the global sequential position of all 137 overt advocating actions by caregivers observed in the 100 visits.

**Table 3-4.**  
**Global Sequential Placement of Overt Advocating Actions (N=137)**

Action Type	Problem Presentation	History-taking	Physical Exam	Diagnosis	Treatment	Closing	Total # of Actions
Evaluations	6	12	1	2	17	0	38
Inquiries	1	2	4	19	37	1	64
Statements	1	3	1	3	14	0	22
Requests	0	1	0	1	13	0	15
<b>Total</b>	8 (6%)	18 (13%)	6 (4%)	25 (18%)	81 (58%)	1 (1%)	
	<b>Earlier</b>			<b>Later</b>			
	32 (23%)			107 (77%)			139 (100%)

The results reveal that the overt advocating actions tend to occur later in the consultation – 77% of the overt advocating actions occur in last phases of the consultations, with 58% produced in the treatment phase alone.

In sum, the distributional pattern of the local and global sequential placement of caregivers’ overt advocating actions indicates that although caregivers display a high level of agency, they still orient to treatment advocacy for antibiotics as a high-stakes social action that they handle with care. This is evidenced by the fact that (1) the advocating actions are not produced in all visits; (2) when they are produced, they tend to be produced later in the consultation. This thus reveals that although caregivers orient to their rights in participating in antibiotic treatment decisions, display high level of agency in influencing the prescribing decision outcome, they nevertheless still show some degree of deference to physicians’ authority in this clinic context.

Taken together, my findings in this section reveal that, on the one hand, caregivers' overt advocating actions for antibiotic treatment display a high level of agency and entitlement in treatment decisions; while on the other hand, the caregivers' overt advocacy for antibiotic treatment is produced in a cautious manner through which they display some degree of deference to physicians' authority. This thus indicates that in the Chinese pediatric context, physicians maintain some degree of medical authority, yet their authority is very frequently challenged by caregivers' overt advocating actions, as seen in both the design and sequential environment of their production. The equalitarian relationship between the physicians and caregivers, both a cause and result in caregivers' frequent deployment of overt advocating actions, has a great influence on the antibiotic over-prescription problem in China.

Based on these qualitative findings, in the next two sections, I first present results of physicians' prescribing decisions in these pediatric encounters in the data set; I then describe results of statistical tests of the association between caregivers' deployment of overt advocating actions and the prescribing decision outcomes.

### *3.3.3 What do physicians prescribe after treatment negotiation with caregivers?*

To understand physicians' prescribing decisions in an environment where caregivers' advocacy for antibiotic treatment is both higher in frequency and more overt in form, I examine how frequently antibiotic treatments are actually prescribed to the patients in the Chinese pediatric encounters. Since the findings in earlier sections show that drip antibiotics, as a unique antibiotic treatment modality, rather than oral antibiotics, are most frequently advocated for by the Chinese caregivers (in 69% of the visits where caregivers overtly advocate for antibiotic treatment), I illustrate the prescribing outcomes in three ways to distinguish the differences in treatment modality, in terms of: (i) whether antibiotics are prescribed generally; (ii) whether oral antibiotics and only oral

antibiotics are prescribed; and (iii) whether drip antibiotics are prescribed (where oral antibiotics may or may not be prescribed). Note that the prescribing outcome of each visit is coded with the strongest type of treatment being prescribed. Thus, in a visit where both oral antibiotics and drip antibiotics are prescribed, the prescribing outcome of the visit is coded with drip antibiotics. The results of the prescribing outcomes are shown in Table 3-5.

		76 (41%)
<b>Without Antibiotics</b>		76 (41%)
<b>With Antibiotics</b>		111 (59%)
	<b>Oral Antibiotics</b>	53 (48%)
	<b>Drip Antibiotics</b>	58 (52%)
<b>Total</b>		111 (100%)
		187 (100%)

Note: Numbers in parentheses are percentages.

The results reveal that antibiotics in general are prescribed to patients in 59% of the visits. Compared to the prescribing rates of 46% from similar settings in the US pediatric context (Mangione-Smith et al., 2004), the overall antibiotic prescription rates are much higher in the Chinese context than in the American context. Moreover, it is noticeable that among the antibiotic prescriptions, over half of them are for drip antibiotics rather than oral antibiotics. Given that IV drip antibiotic treatment is never used in the American outpatient setting and is usually reserved for conditions that cannot be treated with oral antibiotics (NICE, 2013), the high prescription rates of IV drip antibiotics in the Chinese pediatric outpatient setting are particularly concerning.

### 3.3.4 Do caregivers' overt advocating actions for antibiotic treatment affect physicians' antibiotic prescriptions?

First, to test whether caregivers' use of overt treatment advocacy for antibiotics is associated with physicians' prescribing decisions, a *Chi-square* test of independence is used for all the cases in the data set (N=187). The caregivers' use of overt treatment advocacy for antibiotics is operated through a binary variable indicating whether any of the four advocating actions is observed in a visit; whereas the physicians' prescribing decisions are operated through three different binary variables,



showing (i) whether antibiotics are prescribed in general, (ii) whether oral antibiotics are prescribed in general, and (iii) whether drip antibiotics are prescribed in a visit. These three prescribing decision variables are tested against the caregivers' use of overt treatment advocacy for antibiotics variable in three tests individually. Test statistics are presented in Table 3-6.

**Table 3-6.**  
**Test statistics for use of advocating action vs. prescribing outcome (N=187)**

	No antibiotics	Antibiotics		X <sup>2</sup> (P)
Without advocating action	48	28		
With advocating action	39	72		
<b>Total</b>	87	100	187	<b>13.135 (0.0003) ***</b>

	No oral antibiotics	Oral antibiotics		X <sup>2</sup> (P)
Without advocating action	60	74		
With advocating action	27	26		
<b>Total</b>	87	100	187	0.3592 (0.549)

	No drip antibiotics	Drip antibiotics		X <sup>2</sup> (P)
Without advocating action	75	54		
With advocating action	12	46		
<b>Total</b>	87	100	187	<b>21.075 (&lt;0.0001) ***</b>

The result reveals that a caregiver using at least one of the overt advocating actions is significantly associated with physicians' prescriptions, using the binary prescribing outcome variable of antibiotic prescriptions ( $X^2 = 13.135$ ,  $df = 1$ ,  $p < 0.001$ ) and the binary prescribing outcome variable of drip antibiotic prescriptions ( $X^2 = 21.075$ ,  $df = 1$ ,  $p < 0.0001$ ); however, when caregivers' use of advocating actions in the visit is tested against physicians' prescriptions of oral antibiotics, the result does not reveal significant association. These results thus indicate that although caregivers' use of overt advocating actions seems to have a significant effect on physicians' antibiotic prescription overall, such an overall effect is primarily due to the effect of caregivers' overt treatment advocacy for drip antibiotics, rather than oral antibiotics.

Second, to test whether caregivers' use of overt advocating action affects physicians' antibiotic prescriptions, I conduct *Chi-square* tests of association between caregiver use of each of the four advocating actions and the prescribing outcome (using the binary variable of antibiotic

prescription and the binary variable of drip prescription, respectively), in cases where caregivers use the overt advocating action and cases in which no advocating action is used. Table 3-7 shows the test statistics.

**Table 3-7.**  
Test statistics of use of advocating action vs. prescribing outcomes

	No antibiotic	Antibiotic	N	Fisher-P	X <sup>2</sup> (P)
Without request	48	39			
With request	0	12		<b>&lt;0.001 ***</b>	NA
<b>Total</b>	<b>48</b>	<b>51</b>	<b>99</b>		

	No oral antibiotics	Oral antibiotics	Fisher-P	X <sup>2</sup> (P)
Without request	60	27		
With request	6	6	0.207	<b>0.960 (0.327)</b>
<b>Total</b>	<b>66</b>	<b>33</b>	<b>99</b>	

	No drip	Drip	Fisher-P	X <sup>2</sup> (P)
Without request	75	12		
With request	6	6	0.007 ***	<b>7.019 (0.008) ***</b>
<b>Total</b>	<b>81</b>	<b>18</b>	<b>99</b>	

	No antibiotic	Antibiotic	Fisher-P	X <sup>2</sup> (P)
Without desire statement	48	39		
With desire statement	5	11	0.104	<b>2.213 (0.137)</b>
<b>Total</b>	<b>53</b>	<b>50</b>	<b>103</b>	

	No oral antibiotics	Oral antibiotics	Fisher-P	X <sup>2</sup> (P)
Without desire statement	60	27		
With desire statement	14	2	<b>0.225</b>	<b>1.470 (0.225)</b>
<b>Total</b>	<b>74</b>	<b>29</b>	<b>103</b>	

	No drip antibiotics	Drip antibiotics	Fisher-P	X <sup>2</sup> (P)
Without desire statement	75	12		
With desire statement	7	9	0.001 ***	<b>12.507 (&lt;0.001) ***</b>
<b>Total</b>	<b>82</b>	<b>21</b>	<b>103</b>	

	No antibiotic	Antibiotic	Fisher-P	X <sup>2</sup> (P)
Without inquiry	48	39		
With inquiry	16	35	0.008 ***	<b>6.398 (0.011) **</b>
<b>Total</b>	<b>64</b>	<b>74</b>	<b>138</b>	

	No oral antibiotics	Oral antibiotics	Fisher-P	X <sup>2</sup> (P)
Without inquiry	60	27		
With inquiry	37	14	0.703	<b>0.063 (0.801)</b>
<b>Total</b>	<b>97</b>	<b>41</b>	<b>138</b>	

	No drip antibiotics	Drip antibiotics	Fisher-P	X <sup>2</sup> (P)
Without inquiry	75	12		
With inquiry	30	21	0.000 ***	<b>11.788 (0.001) ***</b>
<b>Total</b>	<b>105</b>	<b>33</b>	<b>138</b>	

	No antibiotic	Antibiotic	Fisher-P	X <sup>2</sup> (P)
Without evaluation	48	39		
With evaluation	7	14	0.091	<b>2.414 (0.120)</b>
<b>Total</b>	<b>55</b>	<b>53</b>	<b>108</b>	

	No oral antibiotics	Oral antibiotics	Fisher-P	X <sup>2</sup> (P)
Without evaluation	60	17		
With evaluation	17	4	0.420	0.674 (0.412)
<b>Total</b>	77	21	108	

	No drip antibiotics	Drip antibiotics	Fisher-P	X <sup>2</sup> (P)
Without evaluation	75	12		
With evaluation	11	10	0.002 **	9.939 (0.002) **
<b>Total</b>	86	22	108	

Note: Test statistics of both Fisher's Exact Test and Chi-square Test are provided.

The results reveal the following: (1) all but one caregiver overt advocating action (i.e. evaluation) are significantly associated with physicians' antibiotic prescriptions (whether any antibiotics are prescribed or not); (2) all but one caregiver overt advocating action (i.e., inquiry) are *not* significantly associated with physician's prescriptions of oral antibiotics; and (3) all but one caregiver overt advocating action (i.e., request) are significantly associated with physicians' prescriptions of drip antibiotics. These combined indicate that each type of caregiver advocating actions affects the physicians' prescriptions of antibiotics to different extents, and the effect on physicians' prescriptions of drip antibiotics is stronger than oral antibiotics.

Third, to test whether the number of overt advocating actions that caregivers use in a visit has an effect on physicians' prescribing outcomes, I also use a *Chi-square* test of independence to examine the associations between the number of advocating actions used and the prescribing outcomes (in terms of physicians' prescriptions of antibiotics, oral antibiotics, and drip antibiotics). However, the results do not reveal statistically significant associations.

In sum, the results of the statistical tests of associations between caregivers' use of overt advocating actions in the medical visit and physicians' prescribing decisions reveal that: (1) caregivers' overt advocating actions for antibiotic treatment significantly affect physicians' prescribing decisions – either as a group or individually – indeed all but one advocating actions are associated with antibiotic prescribing, and every one without exception is associated with prescriptions of drip antibiotics; (2) caregivers' overt advocating actions have a larger effect on

physicians' prescriptions of IV drip antibiotics than on prescriptions of antibiotics in general. This finding thus echoes other findings that in the Chinese pediatric encounters, caregivers are primarily advocating for IV drip antibiotics rather than oral antibiotics, which they can easily obtain from street vendors without a physician's prescription.

### **3.4 Discussion**

In this chapter, we have seen that the high prevalence of antibiotic over-prescription, and in particular, the overuse and inappropriate use of drip antibiotic treatment in the Chinese pediatric setting are greatly influenced by demand-side factors, i.e., caregivers' desire and behaviors that they use to advocate for antibiotic treatment in medical interactions. Through a conversation analytical study of caregivers' overt advocating actions in the video-recorded naturally occurring acute pediatric visits, we can see that Chinese caregivers not only commonly communicate their desire for antibiotic treatment to physicians, but also do so much more overtly and more frequently than their American counterparts (Stivers, 2000, 2002c, 2002b, 2006, 2007). The turn design and sequential placement of their overt advocating actions demonstrate that caregivers display a high level of agency and entitlement in their advocacy for antibiotic treatment; yet at the same time, they still display some degree of deference to physicians' medical authority and thus orient to their rights in the antibiotic treatment decision as shared with physicians. Findings from this chapter thus provide counter-evidence for the predominant theory that supply-side factors (i.e., financial incentives for physicians to over-prescribe) are the primary contributors to the high prevalence of antibiotic over-prescription and inappropriate use of IV drip antibiotics (Currie, Lin, & Zhang, 2011; Li et al., 2012; Yip et al., 2014). Findings of this chapter thus shed light to the following themes:

### *3.4.1 Caregiver advocacy and antibiotic over-prescription*

Although research from Western high-income countries have been showing that patients/caregivers pressure can play a crucial role in antibiotic over-prescription (J. Heritage & Stivers, 1999; John Heritage, Elliott, Stivers, Richardson, & Mangione-Smith, 2010; John Heritage & Maynard, 2006; Macfarlane et al., 1997; R Mangione-Smith et al., 2006, 1999, 1999; Rita Mangione-Smith et al., 2015; Stivers, 2005, 2007; Stivers et al., 2003b), the effects of patient/caregiver attitudes and their behaviors in medical interactions on antibiotic over-prescription have not been examined systematically in the Chinese clinical context. Following the line of research on parent behaviors to communicate pressure for antibiotic prescribing in the American pediatric settings, I focused on caregivers' overt treatment advocacy for antibiotic prescriptions in similar settings in the Chinese system. The comparative study of the caregivers' treatment advocacy for antibiotics in the two countries revealed that the difference between caregivers' behaviors in the two countries are striking – the caregivers in the Chinese setting not only advocate for antibiotic treatment more overtly but also more frequently. This thus suggests that physicians in the Chinese pediatric settings are facing a substantial amount of caregiver pressure for antibiotic prescribing and the amount of pressure is larger than their counterparts in the American system.

### *3.4.2 Caregiver advocacy and overuse of IV drip antibiotics*

The other major finding of this chapter is that not only caregivers' advocacy for antibiotic prescription was common, but also the treatment advocacy was primarily about IV drip antibiotics in the Chinese pediatric setting – an antibiotic treatment modality that is not available to the patients in the American outpatient pediatric settings. This finding echoes the prior research findings on high use of infusions in the Chinese clinical context (Y. Li et al., 2012; Reynolds & McKee, 2011; Yuan, 2014) and is in line with the finding from the survey study that caregivers' self-reported desires for

IV antibiotics were the most common compared to other types of prescriptions (Chapter 2). Although there has not been clinical research investigating the effect of antibiotic use through IV administration on bacterial resistance and health outcomes of younger patients more specifically, considering this treatment modality is suggested only for conditions that cannot be treated with oral agents according to the US and UK clinical guidelines, it suggests that caregivers' frequent advocacy for IV antibiotics in the Chinese pediatric setting is profoundly problematic and consequential.

### *3.4.3 Caregiver agency and entitlement in antibiotic treatment advocacy*

In addition to the higher frequency of the Chinese caregivers' overt advocating actions, my findings also revealed that caregivers in the Chinese pediatric settings oriented to a high level of agency and entitlement in advocating for antibiotic prescriptions. Through detailed conversation analysis of the caregivers' advocating actions in the naturally occurring pediatric interactions, it shows that caregivers displayed a high level of epistemic independency, e.g., by evaluating effectiveness of treatment, nominating some particular treatment plan in their inquiries, stating a desire for, or even explicitly requesting for antibiotic treatment. Given that many of these activities are conventionally regarded as within the domain of the physicians' expertise, caregivers deploying these actions can be considered challenges to the physicians' medical authority.

### *3.4.4 Caregiver deference to medical authority and physician-caregiver relationship*

Despite that caregivers displayed a high level of agency and entitlement in advocating for antibiotic prescriptions in the Chinese context, it should be noted that they nonetheless deferred to the physicians' medical authority in the medical interaction to some extent. This can be evidenced by the fact that they still orient to their advocacy for antibiotic treatment as a high-stakes social actions

in that (1) they tend to use less overt forms of advocating actions more frequently, and (2) the advocating actions, particularly more overt forms of actions are more frequently produced in last phases of the consultations. Taken together, it thus suggests that the Chinese caregivers orient to their rights in treatment decision, including antibiotics, as shared with the physicians in the pediatric clinical context.

#### *3.4.5 Supply-side vs. demand-side debate*

With the above said, the findings of my studies thus are not to say China's antibiotic over-prescription problem is solely driven by the demand-side factors, that the supply-side factors do not play any role in this process. Results from this study should be interpreted in terms of to what extent demand-side factors, i.e., caregiver desires and behaviors in medical interactions contribute to the high prevalence of antibiotic over-prescription in China.

As we shall see in the next chapter, in responding to the observed overt treatment advocacy from the caregivers, physicians could react in a manner that is either more or less acquiescing; however, in the face of the caregivers' overt advocacy, they give in to such communicative pressure easily in many cases, which result in a substantial increase of inappropriate prescribing in terms of the difference between what they originally recommend to prescribe and what are ultimately prescribed to the patient after the treatment negotiation.

Given that past understanding of the problem was one-sidedly restricted to the role of the supply-side factors and that a substantial amount of social and economic resources was put forward to address the over-prescription solely from the supply-side, our findings thus highlight the long-neglected role of the demand-side factors, by explicating the process through which antibiotic over-prescription is enacted in the naturally-occurring physician-patient/caregiver interactions. Both my perspective and method are different from the existing studies that were either conducted with

pseudo-patient using experimental research design (e.g., Currie, Lin, & Zhang 2011), or retrospective study of the effects of supply-side factors on antibiotic over-prescription by changing incentive structures (e.g., Yip et al., 2014).



## Chapter 4

### Physician Prescribing Behavior in Pediatric Interaction

#### 4.1 Introduction

In the previous two chapters, we saw how caregivers' desires for antibiotic prescriptions, their self-medication behaviors prior to the visit, as well as their communication behaviors in the pediatric visit have an impact on physicians' behaviors and prescribing outcomes. Moreover, when compared to a similar setting in the American system, I showed that caregivers not only advocated for antibiotics from their physicians more frequently but also did so more overtly and while embodying a higher level of agency and entitlement. These results indicate that physicians in the Chinese system are in an environment where they face a significantly higher level of pressure from caregivers to prescribe antibiotics inappropriately. Yet, to understand how antibiotic prescriptions are handed out to patients and to evaluate whether antibiotic over-prescribing is also being driven by physicians to some extent – by acquiescing to caregivers' pressure – I will now examine physicians' prescribing behaviors in pediatric encounters. In this section, I focus on physicians' prescribing behaviors in acute pediatric encounters.

In particular, given the fact that caregivers frequently overtly advocate for antibiotic treatment, here I ask how physicians react to such overt pressure for antibiotic prescriptions – Do physicians respond to such caregiver advocacy for antibiotic treatment with enthusiasm by invariably acquiescing to pressure? Or do they maintain their stance toward what the proper course of treatment is for the patient's condition by resisting caregiver pressure? Moreover, apart from looking at physicians' reactions to caregivers' treatment advocacy, I also ask how physicians recommend treatment in an environment where there is no direct caregiver pressure for antibiotic prescriptions – How often do physicians recommend antibiotic treatment for their patients in their initial treatment

recommendations? Or do they primarily prescribe only following caregivers' pressure and thus offer antibiotic prescriptions as a change of plans? In addition, given that treatment recommendations are conventionally regarded as within the domain of physicians' professional expertise, it would be natural to assume that physicians can exploit their professional authority to promote antibiotic prescriptions in their treatment recommendations. Yet, it also remains unclear whether physicians in the Chinese pediatric encounters tend to use more authoritarian ways to make treatment recommendations. Answering these questions has important implications for determining the role of demand-side and supply-side factors as contributors to the high prevalence of antibiotic over-prescription in China. In the following, I will briefly review what is known and unknown about the questions raised above.

#### *4.1.1 Background*

##### *4.1.1.1 Physicians' response to caregivers' overt treatment advocacy and antibiotic over-prescribing*

The existing literature, mostly from high-income western countries where no clear financial incentives are tied to physicians' antibiotic prescribing, has been primarily concerned with parent or caregiver behaviors used to communicate pressure. Physicians commonly cite patient desires or expectations for antibiotics as the biggest reason behind the inappropriate prescription of antibiotics (Akkerman, Kuyvenhoven, Wouden, & Verheij, 2005; Barden, Dowell, Schwartz, & Lackey, 1998; Linder & Singer, 2003; Macfarlane, Holmes, Macfarlane, & Britten, 1997; Mangione-Smith et al., 2001, 2004; Mangione-Smith, Elliott, Stivers, McDonald, & Heritage, 2006; Mangione-Smith, McGlynn, Elliott, Krogstad, & Brook, 1999; Mangione-Smith et al., 2015; Scott et al., 2001; Stivers, 2002a, 2002b, 2005b, 2007) and they give in to perceived parental pressure at least part of the time (Mangione-Smith et al., 1999; Stivers, Mangione-Smith, Elliott, McDonald, & Heritage, 2003).

However, less is known about physicians' prescribing behaviors and their responses to patient or caregivers' pressure for antibiotic prescriptions in a more local situated context. One ethnographic study of physician-patient communication in the US clinic context reported that while patients were observed to pressure physicians for antibiotic prescriptions, clinicians were observed to rationalize their antibiotic prescriptions by reporting medically acceptable reasons and diagnoses to patients (Scott et al., 2001). Relatedly, a series of conversation analytic studies of physician-parent interaction in American pediatrics found that physicians' communication behaviors, such as online-commentary during physical examinations (Heritage & Stivers, 1999; John Heritage, Elliott, Stivers, Richardson, & Mangione-Smith, 2010; Mangione-Smith, Stivers, Elliott, McDonald, & Heritage, 2003), alternative ways of responding to parent covert advocating actions such as candidate diagnoses (Stivers, 2002b), and use of particular treatment delivery formats (Mangione-Smith et al., 2006; Stivers, 2005a) have important implications for reducing inappropriate antibiotic prescribing by shaping parents' expectations (Heritage et al., 2010; Mangione-Smith et al., 2006; Mangione-Smith et al., 2015). This body of research thus suggests that (1) physicians' prescribing behaviors at least partially contribute to antibiotic over-prescribing, and (2) a better understanding of physicians' prescribing behaviors, particularly their responses to caregiver advocacy and their treatment recommendation actions in a pressure-saturated environment is important for developing effective interventions to reduce over-prescribing in the clinic context.

#### 4.1.1.2 Physicians' prescribing behaviors and antibiotic prescriptions

Physicians' communication behaviors no doubt have a significant effect on prescribing outcomes. The question remains as to *how* they shape the prescribing outcomes – What are the actions that tend to increase inappropriate prescriptions? What might lead to reduced rates of prescribing? Despite their significance, physicians' prescribing behaviors and their implications for

the over-prescription problem have been relatively understudied. A brief review of current findings on physicians' prescribing behaviors in the American pediatric setting is presented below.

*Online commentary* has been shown to be an effective way to shape parents' views of the treatment plan and reduce inappropriate antibiotic prescribing (Heritage & Stivers, 1999). This communication behavior involves the physician describing what s/he is seeing, feeling, or hearing while examining the patient. By characterizing patient signs as mild or non-existent (e.g., *I don't see anything in that ear.* or *Her nose isn't too bad.*), physicians not only indicate a 'no-problem' diagnosis and imply no need for antibiotic treatment, but also reveal the grounds for this judgment (Heritage & Stivers, 1999). It is found that physician use of this action is significantly associated with perceived parent expectations (Heritage & Stivers, 1999; Mangione-Smith et al., 2003); when physicians used 'no-problem' online commentary, they were significantly less likely to prescribe antibiotics than if they used 'problem' online commentary, citing problematic exam findings (Mangione-Smith et al., 2003). The research thus suggests that training physicians to more consciously and consistently apply 'no problem' online commentary in appropriate situations is most likely to reduce inappropriate antibiotic prescribing effectively, as this prepares families for a non-antibiotic treatment recommendation.

*Formats of treatment recommendation actions* also have implications for patient/parent responses. Treatment recommendation delivery formats can be categorized into two types: (1) positive treatment recommendations – physicians' affirmative suggestions of what should be done for the patient's problem (e.g., *You can give her a teaspoonful of honey just before bedtime until the cough clears up.*) and negative recommendations – physicians' treatment recommendations against a particular treatment (e.g., *What we have here is just a virus, so antibiotics won't help.*) (Stivers, 2005a). Stivers found that physicians' use of the two treatment recommendation formats was highly consequential for parent response. She observed that negative treatment recommendations were significantly associated with

parent resistance (Stivers, 2005a) and higher rates of inappropriate antibiotic prescriptions (Mangione-Smith et al., 2015); while on the other hand, use of positive treatment recommendations was associated with a 52% reduction in the risk of antibiotic prescribing for viral ARTIs, and the combined use of positive and negative treatment recommendations was associated with an 85% reduction in the risk of inappropriate prescribing (Mangione-Smith et al., 2015).

*Prescribing styles* as indicators of the doctor-patient relationship also influence prescribing outcomes. Studies of physicians' prescribing styles can be traced back to microanalysis of physicians' behavior in terms of whether they take into account patients' views and address their concerns effectively – patient-centered style versus doctor-centered style (Byrne & Long, 1976). More recently, prescribing styles have been discussed through analysis of physicians' treatment recommendation actions as well as their responses in cross-cultural contexts and in various clinical settings. Almost all of these studies show that there has been a growing trend towards patient-centered prescribing styles, which represents a departure from the traditional paternalistic doctor-patient relationship and an even distribution of rights and responsibilities between physicians and patients in treatment decision-making (Lindström & Weatherall, 2015; Stivers, 2005a; Stivers et al., 2017). For example, Stivers (2005b) shows that although treatment is conventionally regarded as within the domain of the physician's professional expertise, parent passive resistance can be used as a resource to negotiate treatment because there is a mutual orientation to parent acceptance of the physician's treatment recommendation as mandated for reaching a treatment decision. Similarly, Lindström & Weatherall (2015) raise the point that in medical interactions, both physicians and patients leverage their own epistemic and deontic rights to negotiate treatment decisions – specifically, while physicians normally do so by foregrounding their epistemic authority in medical expertise, patients can do so by mobilizing their personal experience and sometimes medical knowledge. Moreover, in a study of physicians' treatment recommendations in US and UK primary

care settings, Stivers, Heritage, Barnes, et al. (2017) systematically analyzed physicians' different treatment recommendation formats (i.e., pronouncements, proposals, suggestions, offers, and assertions) and found that these different formats primarily vary in the dimensions of epistemic authority and deontic authority embodied in their action design – pronouncements and proposals display physicians' more epistemic and deontic authority; whereas offers and assertions show the reverse. Distinguishing physicians' prescribing styles is important, as it not only displays what kind of relationship exists between the physicians and the patients, but also sheds light on what kind of patient responses physicians' recommendation actions may engender (Thompson & McCabe, 2017) and has a potential effect on the inappropriate prescribing of antibiotics (Mangione-Smith et al., 2015; Stivers, 2005b).

*Initiator of discussion of antibiotic treatment* is a significant indicator of patient/parent expectations for antibiotic prescriptions. In a sample of American pediatric encounters, physicians initiate discussions of antibiotic treatment 74% of the time; whereas parents initiate these conversations 8% of the time (Mangione-Smith et al., 2001). What is striking about this finding is that parent initiation of discussions of antibiotic treatment is a significant predictor of physicians' perceptions of parental expectations for antibiotics – when parents initiate discussions about antibiotics, physicians are four times more likely to believe that they expect antibiotics than if no such initiation occurs. This is consequential for antibiotic over-prescription, as another study reported that when physicians perceive parental expectations for antibiotics, they are 31.7% more likely to prescribe inappropriately (Mangione-Smith, Elliott, Stivers, McDonald, & Heritage, 2006).

#### 4.1.2 Roadmap

In this chapter, to answer the overarching question about to what extent demand-side factors contribute to the antibiotic over-prescription problem in China, I focus on physicians'

prescribing behavior in the acute pediatric visits in my data set (N=187). Using Conversation Analysis as the primary methodology, my objectives in this chapter include (1) to examine how often antibiotics are recommended to the patients by the physicians, (2) to investigate how treatment recommendations are delivered by the physicians, (3) to examine how physicians respond to caregivers' overt advocacy for antibiotic treatment, and (4) to test the effect of physicians' treatment recommendation actions on caregivers' responses and the ultimate prescribing outcomes. In the following, I first introduce the data and methods that I use to investigate physicians' prescribing behaviors; this is followed by a description and illustration of the findings; lastly, I conclude the chapter with a discussion of these findings.

## 4.2 Data and Methods

I investigate physicians' treatment recommendation actions based on the 187 acute visits in my data set. Conversation Analysis is used as a primary method to identify and analyze physicians' treatment recommendation actions. In this study, I restrict my analysis to the turns in which discussion of treatment plans for the patient's condition are first brought up in the consultation. Based on the taxonomy proposed by Stivers et al. (2017), I then classify the identified treatment recommendation actions into three types, including (i) pronouncements, (ii) proposals, and (iii) offers.<sup>13</sup>

Based on the conversation analytic study of the treatment recommendation actions, descriptive analysis is done to show 1) the types of medical treatment being recommended, 2) the types of treatment recommendation actions that physicians use, and (3) the physicians' responses to the caregivers' overt advocacy for antibiotics. Results are reported in frequencies and percentages.

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<sup>13</sup> The physicians' treatment recommendation actions will be discussed in the Results section.

Then, a bivariate analysis is conducted to examine the associations between (1) physicians' treatment recommendations and caregivers' responses, and (2) physicians' treatment recommendations and the prescribing outcomes of the visits, using a *Chi-square test of independence* and *Fisher's exact test*. Results are determined at a significance level of 0.05.

After examining the data in my corpus, I find that (1) physicians do not “sell” antibiotics as hard as one would expect based on the financial incentives that some have considered to drive overprescribing; (2) when delivering treatment recommendations, physicians do not display a high level of authority in mandating caregivers' acceptance; and (3) over-prescribing is not implemented through physicians' promotions of antibiotic treatment; instead they are mostly made by physicians in response to caregiver pressure. In addition, the statistical test results suggest that physicians' use of treatment recommendation action format is sensitive to the type of treatment that they recommend; although their use of particular recommendation action formats and the treatment type that they recommend are not significantly associated with caregivers' immediate responses to their recommendations, they are significantly associated with the prescribing outcome of the visits. These results will be illustrated in greater detail in the following section.

### **4.3 Results**

If supply-side factors drive antibiotic over-prescribing in China, one would expect to see that (1) physicians recommend antibiotic treatment for patients' conditions whenever possible; (2) physicians claim a high level of authority when making their recommendations to put patients on antibiotic treatment; and lastly, (3) physicians readily embrace caregivers' advocacy for antibiotic treatment. However, when I examine physicians' actual prescribing behaviors in interactions with families, I find the opposite: (1) although antibiotics are ultimately prescribed to patients in almost 60% of cases, they are initially recommended to patients in only 40% of cases; (2) in delivering



treatment recommendations, authoritarian forms of recommendation actions are used less frequently than forms that orient to caregivers' rights in treatment decision-making; and even when relatively authoritarian actions are used, they are often mitigated; relatedly, (3) although treatment recommendations have been conventionally considered to exist within the physician's domain of expertise, in 21% of cases, caregivers initiate the discussion of treatment options; among them, a majority are about antibiotic treatment; lastly, (4) in response to caregivers' overt advocacy for antibiotic treatment, physicians resist - at least initially - in a majority of the cases. Taken together, these results reveal that supply-side factors are not a major driving force in the high prevalence of antibiotic over-prescription in China; instead, demand-side factors play an important role, which has long been underestimated. I illustrate these findings in more detail in the sections below.

#### 4.3.1 *Treatments recommended by physicians*

To understand how often physicians recommend antibiotic treatment to patients, I examine the types of treatment being recommended by the physicians in their initial treatment recommendations. Since the physicians and the caregivers typically first decide the modality of the treatment (e.g., oral treatment, IV drip treatment, or hospitalization), it is sometimes unspecified as to whether antibiotics are involved in their initial treatment recommendations. I thus present the distribution of the treatments being recommended across the following eight categories (Table 4-1).

**Table 4-1.**  
**Type of treatment Initially recommended by physicians (n=147)**

Treatment	Frequency	Percentage
Oral - unspecified	31	21%
Oral - non-antibiotic	53	36%
Oral - antibiotic	24	16%
Drip - unspecified	20	14%
Drip - non-antibiotic	0	0%
Drip - antibiotic	5	3%

Hospitalization	10	7%
Other or unspecified	4	3%
<b>Total</b>	<b>147</b>	<b>100%</b>

Note: \*Among the 187 acute pediatric visits, physicians initiate discussions of treatment plans in 147 visits; the remaining 40 visits in which caregivers initiate discussions of treatment were excluded from this analysis.

The results show that in the 147 acute pediatric encounters in which physicians initiate the discussions of treatment plans, physicians explicitly suggest oral antibiotics in only 16% of the cases and drip antibiotics in 3% of the visits.

It should be noted that although it is not always clear whether physicians' recommendations for treatment modalities involve antibiotics or not, their recommendations of IV drip treatments and hospitalization are always understood as including antibiotics.<sup>14</sup> For this reason, I sort the eight categories of treatment recommendations into the following four types: (i) non-antibiotic treatment (including oral-unspecified, oral non-antibiotic), (ii) oral antibiotic treatment, (iii) drip antibiotic treatment (including drip-unspecified, drip antibiotic, hospitalization), and (iv) treatment of other or unspecified types. Table 4-2 shows the distribution of the four types of treatment being recommended by physicians in accordance with this categorization.

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<sup>14</sup> This understanding is based on the concept of 'scalar implicature' (Drew, 1992; Horn & Ward, 2006; Sacks, 1992) and the 'pecking order of treatment modality,' which are discussed in Chapter 3. The idea is that treatment modalities that are commonly available to patients include oral non-antibiotic treatment, oral antibiotic treatment, drip antibiotic treatment, and hospitalization; and these treatment modalities are ranked in ascending order in terms of their perceived strength and effectiveness. Therefore, even when it is not specified in physicians' recommendations of drip treatment, both parties understand that IV drip treatment and hospitalization usually involves antibiotics.

**Table 4-2.**  
**Type of treatment Initially recommended by physicians (n=147)**

Treatment	Frequency	Percentage
Non-antibiotic	84	57%
Oral - antibiotic	24	16%
Drip - antibiotic	35	24%
Other or unspecified	4	3%
<b>Total</b>	<b>147</b>	<b>100%</b>

Note: \*Among the 187 acute pediatric visits, physicians initiate discussions of treatment plans in 147 visits; caregivers initiate discussions of treatment in the other 40 visits.

Based on this coding scheme, the results show that antibiotic treatment is recommended to patients in 40% of the visits (oral antibiotics and drip antibiotics, combined); whereas non-antibiotic treatment is recommended in 57% of the visits. Thus, in their initial treatment recommendations, the physicians do not recommend antibiotic treatment as frequently as one would expect them to, if they were driven primarily by financial incentives. However, when compared to the ultimate prescribing outcomes, it is found that physicians' antibiotic prescriptions increase to 59% of the visits. Table 4-3 shows the prescribing outcomes of the visits in our data set.

**Table 4-3.**  
**Type of Treatment Initially Recommended & Ultimately Prescribed by Physicians (n=187)**

	Initial Recommendations		Ultimate Prescriptions	
	Frequency	Percentage	Frequency	Percentage
Oral - non-antibiotic	84	57%	76	41%
Oral - antibiotic	24	16%	53	28%
Drip - antibiotic	35	24%	58	31%
Other or unspecified	4	3%	0	0%
<b>Total</b>	<b>187</b>	<b>100%</b>	<b>187</b>	<b>100%</b>

Note: \*In all of the 187 cases, patients were prescribed with some specific type of treatment.

As shown in the table, although antibiotics are initially recommended to the patients in 40% of the cases, they are prescribed to patients (in either oral or drip form) in 59% of the cases – an almost 50% increase. The findings thus indicate that the physicians do not drive antibiotic

prescriptions enthusiastically; instead, their prescribing decisions are greatly influenced by their interactions with the caregivers.

Although no population-based estimation of bacterial prevalence among children with acute respiratory tract infections (ARTIs) in China has been identified yet, a few regional and condition-specific studies have shown that the bacterial prevalence rate is unlikely to vary significantly between children in China and children in the US. For example, a study reported that bacteria were isolated in 69.4% cases among Acute Otitis Media (AOM) pediatric patients in Suzhou, China, (Ding et al., 2015), and the national estimate of bacterial prevalence among AOM pediatric patients in the US was 64.7% (Kronman, Zhou, & Mangione-Smith, 2014); in addition, among pharyngitis patients, the Group A Streptococcus (GAS) incidence rate was reported to be 29.8% in a Beijing-based study (Wu et al., 2016), and the same US-based study of bacterial prevalence reported that GAS was isolated in 20.2% of the episodes (Kronman et al., 2014). Given that antibiotic prescribing rates were similar in the two country settings – 59% in my data set in China and 56.9% in the US settings (Kronman et al., 2014), where there were no clear supply-side incentives, and that physicians recommended antibiotics in an even lower 40% of cases in their initial treatment recommendations, physicians in the Chinese pediatric contexts did not seem to drive the over-prescription problem as one would expect them to, if they were primarily prescribing for financial gain.

#### *4.3.2 Physicians' treatment recommendation actions*

A second line of inquiry in the investigation of whether the supply-side factors are major contributors to the high prevalence of antibiotic over-prescription in China is physicians' actions in delivering treatment recommendations. If physicians are primarily prescribing for financial profit, one would expect physicians to push hard for caregivers' acceptance of their recommendations of antibiotic treatment. In the clinic environment, where physicians are regarded as professionals and

have epistemic primacy in determining what is the best course of treatment for the patient's conditions, they could easily achieve this goal by asserting a high level of authority in delivering the treatment recommendations and thus leaving caregivers not much freedom in choosing. However, this also seems not to be the case. In the next subsection, I examine physicians' treatment recommendation actions and ask the question: What prescribing styles do physicians use – do physicians make their treatment recommendations in a more authoritarian way that involves caregivers minimally in the treatment decision-making process, or is it otherwise?

#### *4.3.2.1 Distributional pattern of treatment recommendation actions*

To examine physicians' prescribing style, I analyze physicians' treatment recommendation actions – their distribution and their action design in the interactions. Following the taxonomy of treatment recommendation actions proposed by Stivers et al., (2017), the physicians' treatment recommendation actions are identified and sorted into three types,<sup>15</sup> including (i) pronouncements, (ii) proposals, and (iii) offers. The three types of treatment recommendation actions fall on a descending scale of deontic and epistemic authority, allowing a varying degree of caregiver involvement in the treatment decision. With a pronouncement, we would see evidence that physicians are adopting a stance of high authority and leaving little room for caregivers to negotiate

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<sup>15</sup> In their work, Stivers, Heritage, Barnes, et al., (2017) categorize physicians' treatment recommendation actions in the US and UK primary care setting into five categories, including (i) pronouncements, (ii) proposals, (iii) suggestions, (iv) offers, and (v) assertions. In this study, we adapt this taxonomy and sort physicians' recommendation actions into three types. Details of the adaptation and the definition of the new category will be discussed below.

or advocate for an alternative (though they still might do this). With proposals or offers, physicians adopt a stance that they are prepared to yield to, or at least consider, caregivers' opinions.

Descriptive analysis of the recommendation actions shows that the less authoritarian treatment recommendation actions (i.e., offers and proposals) are used by physicians more frequently in the pediatric encounters than the more authoritarian kinds (i.e., pronouncements), suggesting that physicians typically adopt a stance towards caregivers as “drivers” of the treatment decision. Table 4-4 shows the distribution of the three types of treatment recommendation actions.

**Table 4-4.**  
**Physicians' treatment recommendation actions (n=147)**

<b>Action</b>	<b>Frequency</b>	<b>Percentage</b>
Pronouncements	61	42%
Proposals	65	44%
Offers	21	14%
<b>Total</b>	<b>147</b>	<b>100%</b>

Note: \*Among the 187 acute pediatric visits, physicians initiate discussions of treatment plans in 147 visits; caregivers initiate discussions of treatment in the other 40 visits.

As shown in the table, among the 147 physician-initiated treatment recommendations for the patients' conditions, the proposal format is the most frequently used – observed 44% of the time; this is followed by pronouncements, which make up 42% of the cases; additionally, in 14% of the cases, physicians use offers to make treatment recommendations. Proposals and offers, the less authoritarian formats of recommendation actions (this will be explained in the next subsection), account for a total of 58% of the cases; whereas pronouncements, as a more authoritarian format of treatment recommendation action, account for 42% of the cases. It thus indicates that overall, physicians treat their relationships with caregivers as egalitarian when it comes to treatment decisions.

In the US clinic setting, by comparison, it is found that the most frequently used treatment recommendation action format is pronouncement – observed in 65% of the cases; whereas

proposals, suggestions, and offers, combined, accounted for 30% of the cases.<sup>16</sup> This finding thus shows that overall, physicians tend to rely on less authoritarian ways of recommending treatment in Chinese pediatric settings than in the US.

I now examine more closely physicians' treatment recommendation actions by the type of treatment that they recommend, in terms of (i) non-antibiotic treatment, (ii) oral antibiotic treatment, and (iii) drip antibiotic treatment. Table 4-5 shows the distribution.

**Table 4-5.**  
**Physicians' treatment recommendation actions & treatment recommended (n=143)**

	Non-Antibiotics	Oral Antibiotics	Drip Antibiotics	Antibiotics (combined)
Pronouncements	39 (46%)	12 (50%)	10 (29%)	22 (37%)
Proposals	42 (50%)	10 (42%)	13 (37%)	23 (39%)
Offers	3 (4%)	2 (8%)	12 (34%)	14 (24%)
Total	84 (100%)	24 (100%)	35 (100%)	59 (100%)

Note: \*Among the 187 acute visits, 40 in which caregivers first initiated treatment discussions were excluded; 4 in which the treatment being recommended was unclear were also excluded.  
† Numbers in parentheses are percentages of the column totals.

The results reveal that when physicians recommend antibiotic treatment, they use the authoritarian forms of recommendation actions less frequently – antibiotic treatment recommendations in the form of pronouncements account for only 37% of the cases; whereas the least authoritarian form of recommendation action, i.e., offers, occur 24% of the time. When this is compared to the US primary adult care setting, it is found that physicians' antibiotic treatment recommendations in the form of pronouncements in the US are much more frequent – accounting for over 90% of the cases (Stivers et al., 2017).

<sup>16</sup> Treatment recommendations in the format of assertions make up the remaining 5% of the US cases.

Moreover, it should be noted that when physicians recommend drip antibiotic treatment to patients, pronouncements account for the lowest percentage of recommendations, with less authoritarian formats, i.e., proposals and offers, occurring 37% and 34% of time, respectively. This relative distribution of the different treatment recommendation actions is quite different in cases where the physicians recommend either non-antibiotic treatment or oral antibiotic treatment to the patients.

This thus suggests that (1) physicians in Chinese pediatric encounters demonstrate an overall lower level of authority, when compared to their American counterparts; and (2) when physicians in the Chinese context make treatment recommendations for antibiotics, particularly drip antibiotics, they display a lower level of authority than in their recommendations for non-antibiotic treatment.

This distributional pattern in physician-initiated treatment recommendation actions presents a general indication of how physicians make treatment recommendations in the pediatric encounters. To better understand physicians' treatment recommendations, and particularly their prescribing style – whether and how they involve caregivers in treatment decisions, I illustrate the three types of treatment recommendation actions in greater detail in the next subsection.

#### 4.3.2.2 Treatment recommendation actions, caregiver involvement, and physicians' authority

As briefly mentioned above, the physicians' treatment recommendation actions are categorized into three types, including (i) pronouncements, (ii) proposals, and (iii) offers, falling on a descending scale of deontic and epistemic authority, with a corresponding increasing degree of caregiver involvement. I now illustrate these three types of physician-initiated treatment recommendation actions – their definitions, their counterparts in the American clinic context, as well as their turn designs. More importantly, I show how the physicians' use of these different



recommendation actions displays their orientation toward the rights and responsibilities associated with treatment decisions as shared with the caregivers.

(i) *Pronouncements*

Pronouncements are recommendations formulated in a way in which physicians assert full agency over treatment recommendations, as defined in Stivers et al. (2017). The recommendation is delivered as though the decision has already been made and the caregivers have no choice in the matter. An example of a pronouncement in an American clinic setting is illustrated below.

```
Example_1_Pronouncement(2)_US
1 DOC:  Okay. So, (0.2) uh::m, (0.6) <I'm goi:ng to:>
2       start you on Bactrim,
3 DOC:  We [can do uh three day course of Bactrim,]
4 PAT:  [          ((nodding))          ]
5 DOC:  [uhm:, ]=
6 PAT:  [°Okay.°/((nodding))
7 DOC:  =an:d uh: (0.2) I need tuh know how you're
8       feeling, . . .
```

This example shows a case typical of pronouncement in US consultations. In this case, the physician uses a *I'm going to do X* format to make the treatment recommendation. This turn design shows that 1) the physician treats the treatment recommendation as a settled fact which requires no overt response or endorsement from the patient, and 2) the physician highlights her own role in instigating the treatment recommendation. This action format thus represents a rather authoritarian way that physicians deliver treatment recommendations.

In the Chinese pediatric context, this action format is also used by physicians to deliver treatment recommendations. With the pronouncements, the physicians present the treatment being recommended as a settled fact and caregivers' endorsement or acceptance is thus treated as not necessary. Example 2 illustrates a case.

```
Example_2_05_0922_01
Condition: Coughing
1      D:  你是一个细菌性的感染哦。
         ni shi yi-ge xijunxing de ganran o
         you BE one bacterial PT infection PT
```

2           GF:        'Your (condition) is a bacterial infection, ok?'

              哦 , 细菌性 感染 .

              o xijunxing ganran

              ok bacterial infection

              'Ok. (A) bacterial infection.'

3           D:        细菌性 感染 , 要 挂水的 哦 .

              xijunxing ganran **yao guashui de o**

              bacterial infection **need drip PT PT**

              'A bacterial infection. (It) need to have drip.'

4           GM:        哦 ,

              o

              ok

              'Ok.'

In Example 2, the patient is diagnosed with a bacterial infection. After delivering the diagnosis (line 1 and line 3), the physician makes a recommendation to put the patient on IV drip treatment (line 3). Primarily conveyed through the modal auxiliary word *yao* ('need to'), the recommendation is designed in a way that it states the *necessity* of using the IV drip treatment for the patient's condition rather than the possibility of choosing this treatment. More specifically, the *necessity* encompasses two dimensions: (1) it orients to the physician's epistemic certainty regarding the treatment being recommended, based on the physician's professional judgment of the patient's condition; and (2) it is also concerned with the social function of obligation in pushing the patient/caregiver to act in accordance with the recommendation – a deontic obligation (Bybee & Fleischman, 1995; Lyons, 1977). In sum, the action design of pronouncement thus displays the physician's high level of epistemic authority and high level of deontic authority in recommending treatment.

A similar case is shown in Example 3. In this example, the patient is visiting for persistent coughing and vomiting. In the interaction prior to the excerpt shown, the caregiver stated that prior to the visit, she had already given the patient some non-antibiotic medicine. After a physical examination of the patient's throat (line 1), the physician recommends cough syrup and oral antibiotics (line 2).

Example 3\_05\_0917\_14  
Condition: Coughing, vomit  
1           ((Physician examining patient's throat))

- 2 D: 你咳嗽的话要加点止咳糖浆吃吃，  
 ni kesou de-hua yao jia dian zhike tangjiang chi chi  
 you cough case need add some anti-cough syrup eat eat  
 加点消炎药了。  
 jia dian xiaoyanyao le  
 add some antibiotics PT  
**'You're coughing. In that case,  
 (you) need to have some cough syrup.'**
- 3 M: 好的。  
 hao de  
 good PT  
 'Ok.'

As shown in the excerpt, the physician's treatment recommendation also treats the decision as already made and implies that the caregiver does not have much choice in the matter. Similarly, this effect is achieved through the modal auxiliary verb *yao* ('need to'), which conveys the necessity of using the recommended treatment both on epistemic grounds and on deontic grounds. It thus also displays the physician's high level of epistemic authority and deontic authority in the treatment decision.

Example 4 shows another example of a physicians' pronouncement, in which the physician claims an even higher level of deontic authority as compared to Example 1. In this case, the patient is brought in for coughing and severe wheezing at the time of the visit. The physician recommends hospital admission for the patient's condition (line 1).

Example 4\_03\_10221\_27

Condition: Coughing, wheezing

- 1 D: 你这个必须得住院，啊？  
 ni zhege bixu dei zhuyuan a  
 you this must ought-to hospitalize ok  
 这没啥说的。  
 zhe mei sha shuo de  
 this no what say PT  
**'Yours, this, (he) must be admitted, ok?  
 There is nothing more to say.'**
- 2 M: 住院吧，行。  
 zhuyuan ba xing  
 hospitalize PT alright  
 '(Let him) be admitted, alright.'

Similar to the physicians' treatment recommendations in Example 1 and Example 2, in this case, the physician also presents the treatment recommendation as a settled matter, in which the caregiver does not have much freedom to choose. This is primarily conveyed through the lexicon

choices of *bixu* ('must') and *dei* ('ought to'), two modality auxiliary verbs which not only convey the highest possible level of epistemic certainty in the speaker's judgment on the treatment plan, but also the highest possible level of deontic obligation for the patient/caregiver to act in accordance. Compared to the modal auxiliary verb *yao* ('need to') in Example 1, although the two choices do not differ greatly in terms of the level of embodied epistemic authority, the level of embodied deontic authority is significantly higher in physician's lexical choice of *bixu* ('must') and *dei* ('ought to') in determining the treatment. In addition, the physician also explicitly states that '*there is nothing much to say*,' which demarcates her stance toward the recommendation as an objective fact. This example thus demonstrates a case of pronouncement, in which the physician displays the highest level of epistemic and deontic authority in my data set.

The above examples show how physicians' treatment recommendations can be delivered in the format of a pronouncement, which treats caregivers' endorsement and participation as minimally relevant in the decision-making process. However, this is not to say that physicians completely disregard caregivers' views and their rights in participating in treatment decision-making. A detailed examination of their action design reveals that physicians commonly downgrade their epistemic and deontic authority through various mitigation devices, even in extreme cases where the physicians display their highest possible level of authority in treatment recommendations (e.g., Example 3).

Specifically, as shown in Example 4, although the physician displays the highest possible level of deontic authority by using the modal auxiliary verb *bixu* ('must'), she still appends a second TCU, *a* ('ok?'), following the treatment pronouncement (line 1), thereby reducing the forcefulness in her action design. Similarly, in Example 3, the physician's treatment pronouncement is also produced with mitigation devices such as (1) use of reduplicated words *chi chi* ('eat eat'), and (2) prefacing the pronouncement with an evidential basis – '*in the case that you are coughing*'; both displaying reduced forcefulness in action design; (3) mitigation can also be achieved with sentence

final particles – instance, in Example 2, the sentence final particle *o* appended to the physician’s pronouncement also works to reduce the forcefulness of the physician’s action (Li & Thompson, 1981, p312); additionally, (4) although pronouns are not often articulated in spoken Mandarin Chinese – a phenomenon called Zero-anaphora (Chen, 1987; C. Li & Thompson, 1979; Tao, 1996), when subject pronouns are included, it displays speakers’ stance toward more agency in producing their social actions, similar to the phenomena discussed in other languages and cultures (Ahearn, 2001; Durant, 1990, 1990; Duranti, 2005). Therefore, compared to physicians’ pronouncements in Example 3 and Example 4, in which the subject pronoun *ni* (*you*) was included in the action design, the physician’s pronouncement in Example 2 in which the subject pronoun was not included displayed physicians’ mitigated assertiveness.

In sum, the physicians’ pronouncements present the treatment recommendation as settled rather than open for discussion. This action type thus represents an overall authoritarian format of physicians’ treatment recommendation, yet they are also usually mitigated through various forms of turn design.

#### *(ii) Proposals*

The second type of physician treatment recommendation action is the proposal. Proposals are recommendations produced with a reduced level of physician authority over treatment decisions. What primarily distinguishes proposals from pronouncements is that proposals explicitly invite caregivers’ endorsements of the recommendation; pronouncements do not. In so doing, physicians present treatment decisions as neither entirely up to the physicians nor entirely at caregivers’ discretion. Thus, the treatment decision is oriented to as a domain of shared rights and responsibilities – a collaborative endeavor between physicians and caregivers.

In the US clinic settings, Stivers and colleagues (2017) identified two types of treatment recommendation actions that are relevant to the type of action that I describe here, including ‘proposals’ and ‘suggestions.’ According to their definitions, with ‘proposals,’ physicians recommend in a way that specifically invites the endorsement or collaboration of the patient; whereas with ‘suggestions,’ physicians recommend in a way that leaves the decision largely in the hands of the patient, while nonetheless asserting agency over making the recommendation (Stivers et al., 2017). Although ‘proposals’ are distinct from ‘suggestions’ in that ‘with suggestions physicians relinquish their deontic authority over the decision,’ while ‘proposals enact a sharing of deontic authority over the recommendation’ (Stivers et al., 2017); nevertheless, both actions are formulated as neither entirely up to the physician nor as entirely at the patient’s discretion. Moreover, they are relatively more difficult to separate as actions in Mandarin, particularly because pronouns are not often (Chen, 1987; C. Li & Thompson, 1979; Tao, 1996). For these reasons, I combine proposals and suggestions into one category of treatment recommendation action, using “proposals”<sup>17</sup> as a gloss for the category. Next, I provide examples of ‘proposals’ and ‘suggestions’ as defined in the US clinic setting; I then illustrate physicians’ proposals as one type of treatment recommendation action in the Chinese pediatric encounters.

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<sup>17</sup> “Proposal” is used to name this combined group of treatment recommendation actions with no connotation of the degree of deontic authority embodied in their action design as compared to “suggestion.” It is used to characterize the same core feature of this group of actions, that physicians assert some degree of authority over recommending the treatment – either epistemic or deontic, or both, yet the decision is not entirely up to any one party.

Example 5 is a case of a physicians' 'proposals' in the US clinic setting. The patient presented with a severe rash and hives several days ago. The physician recommends *plain Allegra* for the condition.

Example 5\_(6) US

1 PAT: ... and that's the only thing that was- that's  
 2 d'ifferent. = [hh  
 3 DOC: [hh Why don't we try this. (.) Why  
 4 don't we put you on thuh <plain Allegra, >  
 5 PAT: Mka[y,  
 7 DOC: [hh Uh once daily dose of uh hun[dred=  
 8 PAT: [Kay.  
 9 DOC: =an' eighty milligra:m, an' [that should prevent =  
 10 PAT: [Mkay,  
 11 DOC: =his rash from coming out, ...

The recommendation utilizes a proposal format of *Why don't we*, highlighting two aspects of proposals: (1) it conveys the forthcoming recommendation as not yet settled, but designed for further discussion; (2) the lexical choice of *try* conveys that it is unclear whether the recommended medication will be effective in alleviating the condition, thus presenting the recommendation with an epistemic hedge and reduced deontic authority. It is argued that in contrast with pronouncement, where the recommendations are delivered as entirely determined at the time of delivery, the 'proposal' invites collaboration in the decision-making process (Stivers, Heritage, Barnes, et. al, 2017).

Example 6 shows a case of physicians' 'suggestions' in the US clinic setting. In this case, the patient has presented with recurrent nose bleeds. Just prior to this extract, the patient has renewed complaints about nasal drainage, for which the physician suggests *Claritin* as a viable treatment (line 4).

Example 6\_(4) US

1 DOC: Theh- other possibility: i- it might be  
 2 just post nasal dri:p.  
 3 PAT: Well that's what ^I think. you know, but:\_  
 4 DOC: >Ya know< you could try ^Claritin for that.  
 5 PAT: Yeah °I've got some Claritin.°  
 6 DOC: Okay. (1.0) ((other line of questioning))

The recommendation is delivered in the format of *you could try*, highlighting two aspects of suggestions: (1) it highlights the patient's sole discretion in the treatment decisions, (2) it highlights the optionality of the recommendation. Despite the fact that suggestions can take other formats, such as *I would get*, or *you can try*, it is argued that all suggestions treat the recommendation as optional, in direct contrast with pronouncements (Stivers et al., 2017).

We now turn to physicians' treatment recommendation actions in the format of proposals in the Chinese pediatric context. As mentioned earlier, by using the action format of proposals, physicians display their orientation toward the treatment decision as a collaborative endeavor and a domain of shared rights and responsibilities with the patients. In the Chinese-speaking context, this is frequently done by physicians soliciting explicit acceptance from the caregivers (e.g., using question tags such as *haoba? ('ok?')*), different from the pronouncements, in which the caregivers' acceptance is only normatively oriented to as relevant but not explicitly sought by the physicians as so. I illustrate this point in Examples 7-8.

In Example 7, the patient has presented with coughing. The diagnostic test finds the result slightly abnormal (line 1); given this condition, the physician recommends oral treatment for the child (line 2).

Example 7\_06\_0920\_14

Condition: Coughing

- 1 D: 血象 有点 高 .  
 xuexiang youdian gao  
 hemogram a-little high  
 '(Her) hemogram is a little high.'
- ((four lines of discussion of child's immunity omitted))
- 2 D: 还好 , 吃 药 , 好 吧 ?  
 haihao chi yao hao ba  
 alright eat medicine good PT  
 '(It's) alright. **Take some oral medication, ok?**'
- 3 GM: 嗯 , 好 . 他 喊 嘴 疼 哎 .  
 en hao ta han zui teng ai  
 yeah good he shout mouth ache PT  
 'Yeah, ok. He complained about pain in his mouth.'

As shown in the excerpt, the physician recommends the oral treatment in a way that (1) she asserts epistemic authority over the judgment of what is the proper course of treatment for the



patient's condition, and yet (2) she withdraws some degree of deontic authority over the recommendation by explicitly inviting the caregiver to endorse and accept the recommended treatment (in contrast with physicians' pronouncements). Particularly, the effect of (1) is achieved through the physician nominating an explicit treatment plan for the patient's condition (this in particular is different from physicians' offers, which we will explain later); while the effect of (2) is primarily conveyed through the question tag *baoba* ('*ok*') at the turn final, creating a conditional relevance for the caregiver's acceptance, under the sequential constraints of the question-answer adjacency pair and action type of proposal-acceptance. It thus displays the physician's orientation that the treatment decision is not solely decided by him/her alone, but is a joint activity in which rights and responsibilities are shared with the caregivers.

In Example 7, I demonstrated a case where the physician displayed a relatively full epistemic authority but reduced deontic authority over their treatment recommendation. In the following example, I now turn to show a case in which the physician can also retreat, at least partially, from full epistemic authority over the treatment recommendation.

In Example 8, the patient presented with a sore throat and coughing that has lasted for two days. At line 2, the physician recommends putting the patient on oral treatment and the caregiver's acceptance is explicitly sought with the question tag *a* ('*ok?*').

Example 8\_04\_1127\_08  
 Condition: Sore throat, coughing  
 D: Doctor, M: Mother

1 ((Physician writing on medical records))  
 2 D: 在家可以先吃点药, 啊?  
     zai jia keyi xian chi dian yao a  
     at home could eat first some medicine a  
     '**(You) could take some oral medication first, ok?**'  
 3 M: 嗯 .  
     en  
     yeah  
     '*Yeah.*'

The recommendation is formulated in a way that (1) it presents the recommendation as optional; and (2) it emphasizes the caregiver/patient's agency or discretion in the treatment decision.

Specifically, these two effects are primarily achieved through using the modal auxiliary verb *keyi* ('could'). The semantic meaning of *keyi* is similar to 'may/might' and/or 'can/could' in English. Bybee and Fleischman (1995) argue that 'may/might' conveys deontic permission (*you may come in now*) and 'can/could' conveys permission and root-possibility, more essentially in the domain of epistemic possibility (p5). Following this line of reasoning, on the one hand, *keyi* ('could') highlights the 'optionality' aspect of the recommendation by presenting it as one among other options; on the other hand, it also conveys the meaning that the physician is giving the caregiver permission to choose that treatment. Thus, physicians' recommendations in such a format display both their reduced epistemic authority and reduced deontic authority. Moreover, in this case, the physician also presents her recommendation as tentative with the lexical choice of *xian* ('first') in the action design; this further downgrades the physician's epistemic and deontic authority over the recommendation. In addition, to further solicit the caregiver's response, the physician also appends a question particle *a* at the turn end. These turn design features further show that the physician's proposals orient to the caregivers' involvement and endorsement as essential in the treatment decision.

In sum, with recommendations in the format of a proposal, physicians display their recommendations as in need of caregivers' involvement and endorsement. Compared to recommendations that are delivered in the format of pronouncements, proposals display a reduction in physicians' deontic authority over the recommendation. Pronouncements present the recommendation as a settled decision, while proposals present the treatment as not yet decided. In addition, as mentioned briefly, proposals are also distinct from offers in that they maintain some epistemic authority over the recommendation, whereas offers do not necessarily do so. We now turn to physicians' offers as a third type of recommendation action in the next section.

(iii) *Offers*

The third way for physicians to recommend treatment is to offer the treatment that caregivers desire. This action typically involves physicians inquiring about caregivers' views of their treatment preference; their views are then incorporated into the physicians' recommendations, or the caregivers may lean in to request the treatment that they desire.

Offers as a form of treatment recommendation action are also observed in the US clinic setting. According to Stivers and colleagues (2017), what characterizes offers as a distinctive treatment recommendation action is that with offers, physicians imply a willingness to prescribe and highlight the role of patient preferences rather than medical necessity. This can be illustrated in Example 9 – a case of an offer in the US clinic setting.

In this case, the patient presented with ear pain. Besides an antibiotic (data not shown) and a decongestant (lines 1-2), the physician also recommends a nasal steroid spray at lines 5-7.

Example\_9\_US\_(8)

```
1 DOC: And uh: for your congestion .hh I
2     would recommend taking Sudafed.
3     (.)
4 PAT: Sudafed?
5 DOC: =An:d I can >if you'd li:ke< I can give you uh-
6     uh: sample of uh nasal steroid spray, if you're
7     also really stuffy up you[r nose,
8 PAT: [O:kay.
9 DOC: [You want that too?,=
10 PAT: [Uh huh,
11 PAT: =Ye[:s:.
12 DOC: [Okay °great.°
```

The recommendation is delivered in a way that highlights the occasioned nature of this recommendation by pointing to the patient's potential desire for the offered treatment with the practice *if you'd like*; addition, by using the modal auxiliary *can*, the physician also displays the recommendation as conditional on the patient's indication of a desire for the offered treatment (Stivers et al., 2017). These features thus display the physician's orientation toward the patient as the primary instigator of the recommendation. This is very similar to physicians' offers in the Chinese pediatric context.

Examples 10-12 illustrate three cases of physicians' offers in the Chinese pediatrics encounters. In Example 10, the patient has presented with coughing. During history taking, the caregiver stated that they had put the patient on oral medication (including non-prescribed oral antibiotics) for two days. After the caregivers evaluate the (in)effectiveness of the oral medication they had used for the child (lines 2-3), the physician inquires about whether the caregivers want to put the child on IV drip treatment.

Example 10\_05\_0919\_11

Condition: Coughing for two days

- 1 D: 你这两天觉得吃的药有用吗?  
ni zhe liang tian jue de chi de yao youyong ma?  
you these two day feel eat PT medicine effective PT  
'Do you think the medication worked in these two days?'
- 2 F: 好像: [效果: 不是那么明显的。  
haoxiang xiaoguo bu shi name mingxian de  
seems effect not is that obvious PT  
'(It) seems that the effect wasn't that obvious.'
- 3 M: [效果不太明显。  
xiaoguo bu tai mingxian  
effect not too obvious  
'The effect wasn't very obvious.'
- 4 D: °嗯.° 那你这个, (.) 想挂点水啊?  
°en.° na ni zhege, (.) xiang gua dian shui a?  
yeah then you this want have some drip PT  
'Yeah. Then you wanna have some drip?'
- 5 (1.0)
- 6 F: 能挂水就挂点水吧。  
neng guashui jiu gua dian shui ba.  
can have drip then have some drip PT  
'If (he) can have drip, then let's have some drip.'
- 7 D: 嗯。  
en.  
yeah  
'Yeah.'

Although the physician's inquiry about the caregiver's treatment preference appears to be an understanding check of the caregivers' treatment advocacy for IV drip treatment conveyed through their negative evaluations of the oral treatment in the prior turns, is actually understandable as an offer of the treatment because it indicates the physician's willingness to prescribe. In response, the caregiver provides a transformative answer, switching the agenda of the physician's prior turn from providing a sought answer to requesting the offered treatment (Stivers & Hayashi, 2010). The caregiver's response thus clearly registers his understanding that the physician's inquiry about the

treatment preference implies a willingness to prescribe conditioned by the caregiver's indication of the treatment preference. Taken together, the physician's offer thus displays a relinquishment of epistemic and deontic authority over the treatment decision, as the recommendation is primarily made to cater to the caregivers' desires.

Example 11 illustrates a similar case. In this example, the patient has presented with recurrent coughing during the past month. The physician suggests the patient take an X-ray test to see if there is pneumonia (line 1); the caregiver rejects the diagnostic test recommendation (lines 3-11). Subsequently, the physician offers a treatment recommendation by asking about the caregiver's treatment preferences (line 13).

Example 11\_05\_0929\_06

Condition: Coughing

- 1 D: 晓得吧?  
xiaode ba  
know PT  
你还想拍个片子啊?  
ni hai xiang pai ge pianzi a  
you still want take a photo PT  
'(You) know? You still want to take a photo?'
- 2 ( 1.0 )
- 3 M: 拍片子啊?  
pai pianzi a  
take photo PT  
'Take a photo?'
- 4 D: 嗯.  
en  
yeah  
'Yeah.'
- 5 ( 1.8 )
- 6 M: 拍片子是什么?  
pai pianzi shi shenme  
take photo is what  
那个x光的.  
nage x-guang de  
that x-ray PT  
What is a photo?  
'That X-ray photo?'
- 7 D: 对.  
dui  
right  
'Right.'
- 8 M: 要不算了先.  
yao bu suan le xian  
or forget-it first  
'Or (we) won't do it first.'
- 9 D: 暂时先[不拍].  
zanshi xian bu pai  
temporary first not take

10 M: '(You) don't take it for the moment?'  
 [ 嗯 , 先 不 拍 .  
 en xian bu pai  
 yeah first not take  
 ' Yeah, we won't take it first.'

11 D: 行 .  
 xing  
 alright  
 'Alright.'

12 ( 2.6 )

13 D: 你 想 怎 么 样 啊 ?  
 ni xiang zenmeyang a  
 you want what PT  
 想 挂 水 还 是 吃 药 啊 ?  
 xiang gua shui hai shi chi yao a  
 want hang liquid or eat medicine PT  
 'What do you want?'  
 (Do you) want to have drips or take oral medicine?'

14 M: 嗯 : , 你 看 这 个 ,  
 en ni kan zhege  
 yeah you look this  
 现 在 吃 的 话 , [ 这 个 药 -  
 xianzai chi dehua zhege yao  
 now eat case this medicine  
 ''  
 Yeah, in your opinion,  
 if (we) take oral medicine now, this medicine-

15 D: [ 现 在 没 有 用 了 .  
 xianzai meiyou yong le  
 now no use PT  
 'It's not useful now.'

The physician's offer is formulated in a way that casts the caregiver's role as central to the treatment decision. This is done first by asking an open-ended question about what the caregiver wants for treatment – '*what do you want?*' – and second, by using an alternative question to invite the caregiver to choose from the two options presented – '*(do you) want to have drips or oral medication?*' It should be noted that compared to the physician's offer in Example 10, where the physician uses a polar question – asking the caregiver about one treatment, like the physician's questions here does – the open-ended question and the alternative question embody a further downgrading of the physician's epistemic and deontic authority over the treatment decision. In particular, with the polar question, the physician nominates one treatment and thus at least weakly endorses it by allowing the caregiver to confirm and thus decide; whereas with the alternative question and open-ended question, the physician displays no preference for any particular treatment, thus letting the caregiver take sole responsibility in the treatment decision.

Example 12 presents another case of a physician's offer, in which the physician uses only an open-ended question to ask about the caregiver's treatment preference. In this case, the patient has presented with a fever and cough over the past few days. In lines 1 to 5, the physician takes the patient's medication history and the caregiver states that she has given the patient non-prescribed oral antibiotics for two to three days prior to the visit. Subsequently, the physician produces an understanding check as to whether the oral antibiotics have not been effective and whether the caregiver wants to have IV drip treatment at line 6.

Example 12\_05\_0917\_05

Condition: Fever, cough for two days

M: Mother, D: Doctor

- 1 M: 消炎药我在家也给他吃的。  
xiaoyanyao wo zai jia ye gei ta chi de  
antibiotics I at home also give him eat PT  
'I also gave him (oral) antibiotics to take at home.'
- 2 D: 吃的什么啊？  
chi de shenme a  
eat PT what PT  
'What did (he) take?'
- 3 M: 头孢。  
toubao  
Cephalo  
'Cephalo.'
- 4 D: 吃了几天了啊？  
chi le ji tian le a  
eat PT how-many day PT PT  
'How many days did he take?'
- 5 M: 吃了两三天。  
chi le liang san tian  
eat PT two three day  
'(He) took it for two to three days.'
- 6 D: 不管用是啊？那你想怎么办呢？  
bu guanyong shi a na ni xiang zenme ne  
not working is PT then you want what PT  
'Not working, is it? **Then what do you want?'**
- 7 M: 这要挂水吧？  
zhe yao gua shui ba  
this need drip liquid PT  
'Does this need drips?'
- 8 D: 挂点吧，好吧？  
gua dian ba hao ba  
drip some PT good PT  
别往气管方向发展。  
bie wang qiguan fangxiang fazhan  
don't to trachea direction develop  
'Have some drips, ok?  
Don't let it develop toward his trachea.'
- 9 M: 那就给他挂下吧，  
na jiu gei ta gua xia ba  
then just give him drip once PT  
看他这两天咳得太厉害了。

kan ta zhe liang tian ke de tai lihai le  
look him this two day cough PT too hard PT  
'Then just give him a little drips.  
He looks coughing too hard these two days.'

With the format '*What do you want?*', the physician avoids presenting any option to the caregiver. Compared to the alternative question in Example 11 and the polar question in Example 10, the open-ended format of the offer is less restrictive, thus facilitating the caregiver's statement of preference openly. In this case, the caregiver overtly advocates for IV drip treatment by inquiring about the treatment in the next turn (line 7); this advocacy for IV drip treatment is then granted by the physician at line 8.

Moreover, besides deploying the syntactic structure of a question in exploring caregivers' treatment preferences, what is also common to the physicians' offers is that in these cases, the physicians uniformly appeal to the caregivers' *wants* or *desire* in the recommendation actions. In the three examples shown above, the lexicon choice of *xiang* ('*want/desire*') are all present. This turn design feature thus characterizes the physicians' offers as primarily based on caregivers' indications of preferences and desires for treatment, rather than medical necessity and appropriateness.

These examples thus show that with offers, physicians orient to caregivers' sole responsibilities in treatment decision-making. Compared to proposals, in which physicians orient to their responsibilities as shared with caregivers, offers display physicians' downgraded epistemic authority and abdication of deontic authority in treatment decisions; compared to pronouncements, in which physicians take the primary responsibility in treatment decision-making and present the treatment decision as settled, offers stand in direct contrast. Therefore, physicians' offers display their lowest epistemic and deontic authority over the treatment decision, and the decision is primarily based on caregivers' preferences.

In this section, I illustrated the three types of treatment recommendation actions that the physicians use in the pediatric encounters in my data set. Specifically, I showed how these different



formats of recommendation actions displayed physicians' orientation toward rights and responsibilities as shared with the caregivers in treatment decision making; moreover, when compared to physicians' prescribing style in the American clinic context, physicians in the Chinese context demonstrated an overall lower level of medical authority in treatment decision making. The rather egalitarian relationship between physicians and caregivers thus indicates that when making treatment recommendations in this clinic setting, the Chinese physicians are not relying on their medical authority to facilitate caregivers' acceptance of any particular treatment, including the antibiotic treatment. However, on the other hand, such an egalitarian relationship might also give way to the caregivers' higher-frequency and more overt forms of treatment advocacy for antibiotics, which is indirectly linked to the over-prescription in this clinic setting.

One piece of evidence related to this point is that in the Chinese pediatric context, a considerably large proportion of the treatment discussions are initiated by the caregivers, rather than the physicians; in addition, among these caregiver-initiated treatment discussions, a majority of them are about antibiotics. I illustrate this finding in more detail in the next subsection.

#### *4.3.3 Caregiver-initiated discussions of treatment plan*

In the above subsections, I showed that when physicians initiate treatment recommendations, they tend to use less authoritarian forms of actions, and the majority of their treatment recommendations are for non-antibiotics (57%-60%). Despite varying in their degree of endorsement and authority embodied in their action designs, these recommendations are all initiated by physicians; nevertheless, in 21% of the visits in my data set, caregivers initiate the discussion of treatment plans. In this section, I focus on the treatment discussions that are initiated by the caregivers. My point is that although treatment recommendations are conventionally considered to be within the domain of physicians' professional expertise, the caregivers, in many cases, take the

initiative to discuss treatment options and thus display their orientation as having the right to influence physicians' prescribing behaviors. In the following, I first illustrate two examples of such caregiver-initiated treatment discussions; I then show how frequently these discussions are about antibiotics.

Example 13 illustrates a case of a caregiver-initiated discussion of treatment plans. In this case, the patient presented with a cough and fever over the past two days. After a physical examination (not shown in the data), the physician takes the history of the patient's symptoms in more detail (lines 1-5). After some extensive detailing of the patient's symptoms by the two caregivers, the caregiver initiates the discussion of the treatment plan by inquiring about IV drip treatment (line 7).

Example 13\_06\_0913\_21

condition: coughing, fever for two days

- 1 D: 上午 还好 是 吧 ?  
shangwu hai hao shi ba  
morning still good is PT  
'He's doing ok in the morning, is he?'
- 2 M: 上午 咳 得 蛮 凶 的 .  
shangwu ke de man xiong de  
morning cough PT rather bad PT  
'He coughed rather bad in morning.'
- 3 GM: 昨天 下午 还 好 , 下午 都 : 都 .  
zuotian xiauwu hai hao xiauwu dou dou  
yesterday after still good afternoon all all  
'(He was) ok yesterday afternoon. In the afternoon, it's all, all.'
- 4 M: 都 蛮 凶 的 , 半 夜 都 咳 .  
dou man xiong de ban ye dou ke  
all rather bad PT half night all cough  
'He coughed rather bad (in the afternoon).'
- 5 GM: 都 咳 , 反 正 都 咳 .  
dou ke fanzheng dou ke  
all cough anyhow all cough  
'(He) coughs (all the time). (He) coughs (all the time) anyhow.'
- 6 ( 2.2 )
- 7 M: 他 要 挂 水 吧 ?  
ta yao gua shui ba  
he need drip fluid PT  
'Does he need drips?'
- 8 D: 今 天 要 么 就 给 你 挂 水 啊 ?  
jintian yaome jiu gei ni gua shui a  
today or just give you drip fluid PT  
'Otherwise (I'll) just give you some drips today?'
- 9 ( 0.3 )
- 10 M: 哈 哈 , 我 也 不 想 给 他 挂 呀 .  
ha-ha wo ye bu xiang gei ta gua ya

Hahhah I also not think give him drip PT  
 'Hahhah. I don't want to give him drips either.'  
 11 D: 是的 哎 , 听着 也 没有 很 严重 ,  
 shi-de ai ting zhe ye mei you hen yanzhong  
 yes PART listen PT also not very serious  
 但是 有 痰 了 .  
 danshi you tan le  
 but have phlegm PT  
 你 把 沙丁胺醇 和 酮替芬 加 上去 ,  
 ni ba Shadinganchun he Tongtifen jia shangqu  
 you get Salbutamol and Antihistamine add onto  
 'Yes. He doesn't sound very serious.  
 But (he's) got phlegm.  
 You add Shadinganchun<sup>18</sup> and antihistamine<sup>19</sup> to it.'

The caregiver's inquiry about the drip treatment is understood by the physician as overtly advocating for the drip treatment (inquiry as an overt advocating action has been discussed in the previous chapter), as following the inquiry, the physician offers the patient the inquired treatment (line 8). The physician's offer of the drip treatment is delivered in a way that it clearly registers the offer as occasioned by the caregivers' treatment advocacy. This is primarily conveyed through the lexicon *yaome* ('otherwise'), which has the meaning of conditionality, or even concession, dependent on the caregiver's action. Note that the following two aspects of the caregiver's response to the physician's offer at line 10: (1) the caregiver treats her overt advocacy for the IV drip treatment as somewhat delicate and problematic, as evidenced by turn-initial laughter tokens (Haakana, 2002; Jefferson, 1985; Osvaldsson, 2004); and (2) the caregiver registers her understanding of the physician's stance that prescription of the IV drip treatment is not what the physician intends to give, but is instead occasioned by her advocacy – this can be evidenced by her lexical choice of *ye* ('also') in the turn design. As shown in the example, when caregivers initiate the discussion of treatment plans, they put physicians in a position to address whatever stance they take toward the treatment.

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<sup>18</sup> Salbutamol: It can treat or prevent bronchospasm.

<sup>19</sup> Antihistamine: It can treat discomfort caused by allergies.

In Example 14, I illustrate another example in which the caregiver initiates the treatment recommendation ahead of the physician. In this case, the patient has presented with a cold over the past week and fever during the last night. Through lines 1 to 3, the physician delivers the diagnosis that the child is having a viral cold. In the face of the caregiver's diagnosis resistance (line 2), the physician further supports it by explicating the details of the test results and by concluding that *'There is nothing big going on.'* (line 3). Following this, the caregiver initiates the discussion of the treatment plan, asking whether IV drip treatment is needed (line 4).

Example 14\_08\_0925\_23

Condition: Cold last week, fever last night

D: Doctor, M: Mother

- 1 D: 还是病毒感冒。  
hai shi bingdu ganmao  
still is viral cold  
'It's still a viral cold.'
- 2 M: 病毒感冒，是啊？  
bingdu ganmao shi a  
viral cold is PT  
'A viral cold?'
- 3 D: 对对对。  
dui dui dui  
right right right  
白细胞种类中性都正常，  
bai xibao zhonglei zhongxing dou zhengchang  
white cell type neutral all normal  
就C反应蛋白高稍微高一点点，  
jiu C fanying danbai gao shaowei gao yidiandian  
没啥说法。  
mei sha shuofa  
no what saying  
'Right, right, right.'  
White cell type, neutral cell (results) are all normal.  
Only c-reactive protein is high, slightly a little high.  
There is nothing big going on.'
- 4 M: 要挂水吗？  
yao gua shui ma  
need drip fluid PT  
'(Does he) need drips?'
- 5 D: 可以不挂。吃药。  
keyi bu gua chi yao  
can no drip eat medicine  
'(You) could have no drip. (You can) take oral medication.'
- 6 M: 哦，行。  
o xing  
ok alright  
'Ok. Alright.'

In response to the caregiver's question, the physician first answers – *'You could have no drips;'* this is then followed with a positive-format recommendation to put the patient on oral treatment

(line 5). It should be noted that the physician displays herself as under pressure following the caregiver's initiation of the treatment discussion. This can be evidenced by the physician's design of the recommendation against the IV drip treatment in that, with the modal auxiliary verb *keyi* ('could'), the physician presents the negative-format recommendation as optional for the patient. Although the negative-format treatment recommendation is immediately appended with a positive-format recommendation for the oral treatment, this formulation of optionality still opens the possibility for the caregiver to negotiate for the IV drip treatment.

Example 15 illustrates a similar case of caregiver-initiated discussion of treatment plans. The patient is brought in for coughing during the night. After a physical examination of the patient's throat, the physician delivers a tentative diagnosis of the patient's condition at line 1. Following this tentative diagnosis, the caregiver initiates the discussion of the treatment plan at line 3.

Example 15\_07\_1125\_17

Condition: Coughing for one night

D: Doctor, M: Mother

- 1 D: 可能还是个支气管有问题。  
keneng hai shi ge zhixiguan you wenti  
perhaps still is PT bronchus have problem  
'Perhaps it's still the problem of the bronchus.'
- 2 ( 1.0 )
- 3 M: 挂点水。  
gua dian shui  
drip some fluid  
'**Have some drips.**'
- 4 D: 不要挂水吧，  
bu yao gua shui ba  
no need drip fluid PT  
你又不发烧，好吧？  
ni you bu fashao hao ba  
you also not fever good PT  
'No need for drips, ok?  
You don't have fever, ok?'
- 5 M: 不挂水不行啊，  
bu guasui bu xing a  
no drip fluid not working PT  
吃药吃了两天不行哎。  
chi yao chi le liang tian bu xing ai  
eat medicine eat PT two day not working PT  
'It won't work if he doesn't have drips.  
He has taken oral medicine for two days, and it didn't work.'
- 6 D: 我建议你还是吃 - 吃点个阿奇霉素。  
wo jianyi ni hai shi chi chi dian-ge Aqimeisu  
I suggest you still is eat eat some Azithromycin  
'I suggest you still take- take some Azithromycin.'

The caregiver's initiation of the treatment discussion is formulated in the form of a request for IV drip treatment. Since the explicit request is the most overt and imposing type of caregiver treatment advocating action (as discussed in Chapter 4), it puts the physician under pressure to prescribe the treatment. Nevertheless, even in the face of such an overt form of treatment advocacy, the physician here rejects the caregiver's request. It should be noted that although the physician rejects the request, she still displays herself as under pressure. First, in response to the request, the physician formulates her turn with a transformative answer, changing the original agenda of the caregiver's turn from granting/rejecting the request to assessing the need for the requested treatment. Second, the transformative answer is also produced with a final particle *ba*, working to reduce the forcefulness of the action. Third, the physician accounts for her rejection by providing a rationale as to why the requested treatment is not needed – ‘*You don't have fever.*’ Lastly, with a question tag *baoba* (‘*ok*’), the physician further solicits the caregiver's acceptance.

In this case, following the physician's rejection of the request, the caregiver again advocates for the IV drip treatment by using a second overt advocating strategy – negative evaluation of the oral treatment (line 5). Despite the caregiver's continued pressure for the IV drip prescription, the physician maintains her original stance, by changing to offer a positive-format recommendation for oral treatment (line 6). Nonetheless, it is noted that her re-offering of the oral treatment recommendation nominates Azithromycin, an oral antibiotic, as the primary medicine; in addition, the lexicon choice of *haishi* (‘*still*’) demarcates her stance as in conflict with the caregiver's. This thus shows that the physician's offering of the oral antibiotic is at least partially due to the caregiver's pressure for prescribing.

The findings from the above show that caregivers took initiative to discuss treatment plans for their children, and they did so in 21% of the visits in the data set. This percentage is high considering that treatment plans are conceptualized as being within the domain of physicians'

expertise and authority. In addition, what is also relevant here is the question: What treatment do the caregivers usually bring up in their initiation of the treatment discussions? Table 4-6 illustrates this.

**Table 4-6.**  
**Caregiver-initiated discussions of treatment plans (n=40)**

Treatment	Frequency	Percentage
Non-antibiotic	18	45%
Oral antibiotic	4	10%
Drip antibiotic	17	43%
Other or unspecified	1	2%
Total	40	100%

As shown in the table, among the caregiver-initiated treatment discussions, the caregivers topicalize antibiotic treatment over half of the time (among them, oral antibiotics are topicalized 19% of the time (n=4), and drip antibiotics are topicalized 81% of the time (n=17)). This result reveals that caregiver-initiated discussions of treatment are not only primarily about antibiotic treatment in general, but are more commonly about drip antibiotic treatment.

In sum, across the data set, caregivers initiate discussions of treatment in 21% of the cases (n=40). Among them, more than half of them are caregivers bidding for antibiotic treatment, particularly IV drip antibiotic treatment. These results thus suggest that in a context where the physicians and the caregivers orient to a rather even distribution of rights and responsibilities in treatment decisions, the caregivers demonstrate a high level of agency and entitlement in obtaining prescription medicine such as antibiotics, even though treatment recommendations are conventionally regarded as being within the domain of physicians' professional expertise, and the decision of the prescription primarily falls on physicians' use of such expertise. The results in this section thus further provide evidence that the problem of antibiotic over-prescription in China is not solely driven by physicians promoting antibiotic treatment to their patients relentlessly; instead, the physicians' abdication of their medical authority in treatment decisions and their egalitarian

relationship with the caregivers in this particular clinic setting at least partially contribute to the problem of antibiotic over-prescription.

In the next section, I more closely examine how the physicians abdicate medical authority in antibiotic treatment decision making; particularly, I examine how physicians' permissive attitudes toward caregivers' overt advocacy for antibiotic treatment contribute to the antibiotic over-prescription problem.

#### *4.3.4 Physicians' responses to caregivers' overt advocacy for antibiotic treatment*

In the previous section, I showed that the discussions of the treatment plan were initiated by the caregivers in a considerably high proportion of the visits in the data set; among these caregiver-initiated discussions of treatment, over half were for antibiotic treatment. This result ties back to the findings on caregivers' overt advocacy for antibiotic treatment in Chapter 4 – the caregivers were observed to advocate for antibiotic treatment overtly and frequently, and to put the physicians under pressure for over-prescribing. Although the excerpts shown in the previous chapter presented a rough sketch of how the physicians react under such pressure, I have not yet discussed how frequently the physicians grant or resist the caregivers' overt advocacy for antibiotic treatment. Answering this question will provide an important piece of evidence to show how the over-prescription problem is not primarily driven by physicians selling hard, but is enacted through physicians caving in to caregivers' pressure to prescribe.

To systematically examine physicians' responses to caregivers' overt advocacy for antibiotic treatment, I analyze physicians' turns immediately following the caregivers' overt advocating actions (as discussed in Chapter 4). Since caregivers' evaluations of treatment effectiveness do not require a specific type of response in terms of sequential organization normatively, physicians' responses to caregivers' evaluations of treatment effectiveness were not included for analysis. Specifically,



physicians' responses to other types of overt treatment advocating actions, including (i) *explicit requests for antibiotics*, (ii) *statements of desire for antibiotics*, and (iii) *inquiries about antibiotics*, are analyzed in terms of the actions undertaken – whether they *grant* or *resist* caregivers' overt advocacy for antibiotic treatment. Table 4-7 shows the distribution of the physicians' responses to the caregivers' overt advocacy for antibiotic treatment.

**Table 4-7.**  
**Physicians' responses to caregiver overt advocacy for antibiotic treatment (n=101)**

Response	Frequency	Percentage
Grant	35	35%
Resist	66	65%
<b>Total</b>	101	100%

Note: \*Results are based on physicians' responses to caregivers' inquiries about antibiotic treatment, statements of desire and explicit requests for antibiotic treatment.

†Results are based on the number of caregivers' overt advocating actions, rather than the number of visits.

The results reveal that in response to the caregivers' overt advocacy for antibiotic treatment, the physicians resist 65% of the time. This result thus suggests that, on the one hand, the physicians do not grant the caregivers' antibiotic treatment enthusiastically, as one would expect them to do if they were primarily prescribing for financial gain; on the other hand, the fact that physicians acquiesce to the caregivers' overt advocacy for antibiotic treatment over one third of the time indicates that the physicians are partially responsible for the high prevalence of antibiotic over-prescription.

In sum, the results from this subsection present further evidence that the problem of antibiotic over-prescription in China cannot be explained solely by the supply-side theory that prevails in the existing literature; instead, the problem of antibiotic over-prescription in China is a more complicated process that involves both supply-side factors and demand-side factors – the latter of which has long been unnoticed or underestimated. A fuller understanding of the

contributors of the problem and the process through which the problem is enacted paves the way for developing effective measures of intervention to reduce over-prescription.

#### *4.3.5 Relationship between action types, treatment types, and prescribing outcomes*

In the previous sections, I have illustrated several different facets of treatment recommendations in the Chinese pediatric encounters, including (1) the types of treatment being recommended by the physicians, (2) the types of action format that physicians use to deliver the treatment recommendations, (3) the initiator of the discussion of the treatment plan. Specifically, I showed that (1) physicians recommend non-antibiotic treatment more frequently than antibiotic treatment in their initial recommendations; (2) they use less authoritarian forms of treatment recommendation actions more frequently than otherwise; and (3) they do not always get to initiate the discussion of treatment plans. All these results suggest that they are not promoting antibiotic treatment to the patients as hard as one would expect if they were prescribing for financial benefit.

Given these findings about the physicians' prescribing actions and the caregivers' responses, I now turn to explore the following questions: (1) Are physicians' treatment recommendation action forms associated with the types of treatment that they recommend? (2) Are caregivers' responses associated with the physicians' treatment recommendations, in terms of (i) the types of treatment being recommended and/or (ii) the types of action format that are used? (3) Are the prescribing outcomes of the visits associated with the physicians' treatment recommendations, similarly in terms of (i) the types of treatment being recommended and/or (ii) the types of action format that are used? And lastly, (4) Are caregiver-initiated treatment discussions associated with physicians' antibiotic prescriptions? Results of the statistical tests of these relationships are presented below.

#### 4.3.5.1 Treatment recommendation action formats and types of treatment recommended

To examine the relationship between the physicians' treatment recommendation action formats and the types of medical treatment that they recommend, I use *Fisher's Exact Test of Correlation* between a 3-level categorical variable indicating the type of treatment being recommended (1=non-antibiotic, 2=oral antibiotic, 3=drip antibiotic) and a 3-level categorical variable indicating the physicians' recommendation action format (1=pronouncements, 2=proposals, 3=offers), among cases in which the physicians initiate the treatment discussions (n=147). Table 4-8 shows the distribution of the physicians' treatment recommendation actions by the types of treatment being recommended.

**Table 4-8.**  
**Physicians' treatment recommendation actions & treatments being recommended (n=143)**

	Non-antibiotics	Oral antibiotics	Drip antibiotics	Total
Pronouncements	39 (46%)	12 (50%)	10 (29%)	61 (43%)
Proposals	42 (50%)	10 (42%)	13 (37%)	65 (45%)
Offers	3 (4%)	2 (8%)	12 (34%)	17 (12%)
Total	84 (100%)	24 (100%)	35 (100%)	143 (100%)

Note: \*Among the 187 acute visits, 40 in which caregivers first initiated treatment discussions were excluded; 4 in which the treatment being recommended was unclear were excluded.  
† Numbers in parentheses are percentages of the column totals.

Statistical test results show that the physicians' treatment recommendation actions are significantly associated with the types of treatment that they recommend for the patients ( $p < 0.001$ ). In other words, when the physicians recommend some particular treatment, they are more likely to use a particular format of recommendation action. Due to relatively small sample size, I was not able to conduct logistic regression to estimate the relative odds ratios of the physicians' use of particular treatment recommendation actions and the types of treatment being recommended. However, as we discussed earlier, the percentage of physicians' pronouncements is lower for antibiotic treatment than for non-antibiotic treatment; moreover, the proportion of less authoritarian forms of

recommendation actions is much higher for drip treatment than oral antibiotic or non-antibiotic treatment.

#### 4.3.5.2 Physicians' treatment recommendations and caregivers' responses

To examine whether certain treatment recommendations by physicians are more likely to engender certain types of responses from the caregivers, I test the associations between caregivers' responses to physicians' treatment recommendations – whether it is acceptance or resistance, and (i) physicians' treatment recommendation action format, and (ii) the type of treatment being recommended by the physician, respectively. Table 4-9 and Table 4-10 shows the distribution of the caregivers' responses by the physicians' treatment recommendation actions, and the caregivers' responses by the type of treatment that the physicians recommend.

**Table 4-9.**  
Treatment recommendation actions and caregiver responses (n=147)

	Acceptance	Resistance	Total
<b>Pronouncements</b>	39 (64%)	22 (36%)	61 (100%)
<b>Proposals</b>	35 (54%)	30 (46%)	65 (100%)
<b>Offers</b>	12 (57%)	9 (43%)	21 (100%)
<b>Total</b>	86 (59%)	61 (41%)	147 (100%)

**Table 4-10.**  
Type of treatment being recommended and caregivers' responses (n=143)

Recommendation	Acceptance	Resistance	Total
<b>Non-antibiotic</b>	50 (60%)	34 (40%)	84 (100%)
<b>Oral antibiotic</b>	15 (63%)	9 (37%)	24 (100%)
<b>Drip antibiotic</b>	18 (51%)	17 (49%)	35 (100%)
<b>Total</b>	83 (58%)	60 (42%)	143 (100%)

Note: Among the 147 cases in which physicians initiate treatment recommendations, 4 cases are excluded because it is unclear whether antibiotics are included.

Results from the *Chi-square test of independence* show that the caregivers' responses are not significantly associated with either the physicians' recommendation action formats or the type of treatment being recommended by the physicians. This suggests that neither the format nor the

content of the physicians' treatment recommendation influences the caregivers' immediate response. This might be due to the fact that caregivers' advocacy for antibiotic treatment is pervasive in Chinese pediatric encounters – although I have shown in Chapter 3 that caregivers' advocacy for antibiotic treatment tends to occur later in consultations, in many cases they do overtly advocate for antibiotic treatment before the treatment phase; therefore, at the time when physicians make treatment recommendations, their treatment recommendation actions may have already taken into account caregivers' stances toward the treatment and may be designed accordingly so as to avoid potential resistance or rejection.

#### 4.3.5.3 Physicians' treatment recommendations and caregivers' responses

To examine whether the prescribing outcome is associated with the physicians' treatment recommendations – the action format and/or the type of treatment being recommended – a *Chi-square test of independence* and *Fisher's Exact Test* are used respectively. Table 4-11 and Table 4-12 illustrate the distribution of the prescribing outcomes of the visits by the physicians' treatment recommendation action format and the type of treatment being recommended respectively.

**Table 4-11.**  
Physicians' treatment recommendation actions and prescribing outcome (n=147)

	Non-antibiotic Rx	Oral antibiotic Rx	Drip antibiotic Rx	Total
<b>Pronouncements</b>	29 (48%)	19 (31%)	13 (21%)	61 (100%)
<b>Proposals</b>	30 (46%)	16 (25%)	19 (29%)	65 (100%)
<b>Offers</b>	5 (24%)	3 (14%)	13 (62%)	21 (100%)
<b>Total</b>	64 (44%)	38 (26%)	45 (30%)	147 (100%)

**Table 4-12.**  
Type of treatment being recommended and prescribing outcome (n=143)

Recommendation	Non-antibiotic Rx	Oral antibiotic Rx	Drip antibiotic Rx	Total
<b>Non-antibiotic</b>	60 (71%)	13 (16%)	11 (13%)	84 (100%)
<b>Oral antibiotic</b>	0 (0%)	24 (100%)	0 (0%)	24 (100%)
<b>Drip antibiotic</b>	3 (9%)	0 (0%)	32 (91%)	35 (100%)
<b>Total</b>	63 (44%)	37 (26%)	43 (30%)	143 (100%)

Note: Among the 147 cases in which physicians initiate treatment recommendations, 4 cases are excluded because it is unclear whether antibiotics are included.

The test results show that both the physicians’ recommendation action formats ( $p=0.023$ ) and the type of treatment being recommended ( $p<0.001$ ) are significantly associated with the prescribing outcome of the visits. Therefore, physicians’ initial treatment recommendation actions, both in terms of how the recommendation is delivered and what treatment is recommended, have a significant influence on the prescribing outcome. Given that physicians are observed to recommend non-antibiotic treatment more often than antibiotic treatment (59% vs. 41%), it suggests that the high antibiotic prescribing rate (60%) in the data set cannot be explained by physicians “selling” antibiotics enthusiastically through their treatment recommendations.

4.3.5.4 Initiator of treatment discussions and prescribing outcomes

To examine whether the initiator of the treatment discussion affects the prescribing outcome, I test their association. Table 4-13 shows the distribution of the prescribing outcome by the initiator of the treatment discussion in the visit.

**Table 4-13.**  
**Initiator of treatment discussion and prescribing outcome (n=187)**

	Non-antibiotic Rx	Oral antibiotic Rx	Drip antibiotic Rx	Total
<b>Physician</b>	64 (44%)	38 (26%)	45 (31%)	147 (100%)
<b>Caregiver</b>	12 (30%)	15 (38%)	13 (33%)	40 (100%)
<b>Total</b>	76 (41%)	53 (28%)	58 (31%)	187

Results from the *Chi-square test* show that there is no significant association between the type of prescription that the patient receives and who initiates the discussion of treatment in the visit ( $X^2=2.960$ ,  $df=2$ ,  $p=0.227$ ). Moreover, since more than half of the caregiver-initiated treatment discussions are about antibiotics, I also test if the caregiver-initiated discussion about antibiotic

treatment is associated with the physicians' antibiotic prescriptions. Table 4-14 shows the distribution of the prescribing outcome by caregivers' initiation of antibiotic treatment.

**Table 4-14.**  
**Caregiver-initiation of discussion about antibiotics and prescribing outcome (n=187)**

	<b>Antibiotic Rx</b>	<b>Non-Antibiotic Rx</b>	<b>Total</b>
No	74 (45%)	92 (55%)	166 (100%)
Yes	2 (10%)	19 (90%)	21 (100%)
<b>Total</b>	<b>76 (41%)</b>	<b>111 (59%)</b>	<b>187 (100%)</b>

Fisher's exact test results reveal that caregivers' initiation of antibiotic treatment is significantly associated with physicians' prescriptions of antibiotics ( $p < 0.01$ ). In addition, I also test the association between the caregivers' initiation of discussions of drip antibiotics and the physicians' prescriptions of drip antibiotics. Table 4-15 shows the distribution of the caregivers' initiation of discussions of antibiotic drip treatment by the physicians' prescriptions of drip antibiotics.

**Table 4-15.**  
**Caregiver-initiation of discussion about drip antibiotics and prescribing outcome (n=187)**

	<b>Non-drip treatment</b>	<b>Drip antibiotics</b>	<b>Total</b>
No	125 (74%)	45 (26%)	170 (100%)
Yes	4 (57%)	3 (43%)	7 (100%)
<b>Total</b>	<b>129 (69%)</b>	<b>48 (31%)</b>	<b>187 (100%)</b>

The test results also reveal that the caregivers' initiation of discussions about drip antibiotic treatment is significantly associated with the physicians' prescriptions of drip antibiotic treatment ( $p < 0.0001$ ). Therefore, these findings indicate that the caregivers' initiation of discussions of antibiotic treatment, and particularly, drip antibiotic treatment, significantly affects physicians' prescriptions.

These results are consistent with the findings from the American pediatric setting – when parents initiate discussions of antibiotic treatment, physicians are four times more likely to prescribe antibiotics (Stivers et al., 2003). It thus further adds to our accumulation of evidence that antibiotic

over-prescribing in the Chinese pediatric context, although not solely driven by physicians' "hard selling," is at partially attributable to physicians responding to caregivers' pressure.

In sum, in this section, I show four things: (1) the physicians' design of their treatment recommendation actions is associated with the type of medical treatment that they recommend; (2) the physicians' treatment recommendations – both their design and their content, affect the prescribing outcomes of the visits; (3) yet, they do not seem to have an effect on the caregivers' immediate responses; and lastly, (4) although the caregivers' initiations of treatment discussions are not significantly associated with physicians' prescribing decisions in general; their initiations of antibiotic treatment discussions, and in particular, drip antibiotic treatment discussions, significantly affect the physicians' prescriptions of the antibiotic treatment and drip antibiotic treatment. These findings indicate that, on the one hand, the physicians – how they design their treatment recommendation and what they recommend for the patient – affects the prescribing outcome; on the other hand, the prescribing outcome can be significantly influenced by the caregivers' initiation of antibiotic treatment discussion. Given the other findings from this study, that (i) the physicians do not recommend antibiotic treatment as frequently as expected (40% of the time), and (ii) the caregivers frequently advocate for antibiotic treatment – either by taking initiative to discuss antibiotics as treatment plans ahead of the physicians (21%), or by overtly advocating for them throughout different stages of the medical encounters (54%), these test results thus provide further supporting evidence that the antibiotic over-prescription problem in China is attributable to both demand-side factors and supply-side factors.

#### *4.3.6 Caregiver advocacy, physician responses, and prescribing outcomes*

Given the findings of physician-caregiver communication behaviors in treatment negotiation so far, I estimated a series of logistic regression models to examine the effect of the following



communication behaviors on antibiotic prescribing outcomes: (i) caregivers' overt advocacy for antibiotics, (ii) physicians' responses to caregivers' advocacy for antibiotics, in a stepwise procedure. The effect parameters of these variables on antibiotic prescriptions are shown in Table 4-16.

**Table 4-16.**  
**Effect parameters of physician-caregiver actions on antibiotic prescriptions (n=187)**

	<b>Model 1</b>				<b>Model 2</b>			
	<i>b</i>	<i>p</i>	OR	95%CI	<i>b</i>	<i>p</i>	OR	95%CI
<b>Intercept</b>	-0.21	0.34	0.813	0.53-1.24	-0.21	0.34	0.81	0.53-1.24
<b>Caregiver advocacy</b>	1.15	<0.001 ***	3.165	1.74-5.87	2.22	<0.001 ***	9.23	3.30-33.08
<b>Physician resistance</b>					-1.46	0.01 **	0.23	0.06-0.68

Notes: † 0 '\*\*\*\*', 0.001 '\*\*\*', 0.01 '\*\*', 0.05.

Results from multivariate logistic regression revealed that caregivers' advocacy for antibiotic treatment is a significant predictor of physicians' antibiotic prescriptions ( $p < 0.001$ ). In cases where caregivers advocated for antibiotic treatment, physicians were over 9 times more likely to prescribe antibiotics to patients than in cases where caregivers did not advocate antibiotic treatment from physicians (OR=9.23, 95%CI: 3.30-33.08), controlling for physicians' response to caregivers' advocacy. In addition, the results also showed that physicians' response to caregivers' treatment advocacy has a significant effect on the prescribing outcome. Compared to cases in which physicians granted caregivers' advocacy for antibiotics, the likelihood of antibiotics being prescribed to patients reduced by 77% if physicians resisted caregivers' advocacy for antibiotics (OR=0.23, 95%CI: 0.06-0.68). The effects of caregivers' advocacy and physicians' resistance to caregivers' advocacy were even stronger on IV drip antibiotic prescriptions, in particular. Table 4-17 shows the effect estimates.

**Table 4-17.**  
**Effect parameters of physician-caregiver actions on IV drip antibiotic prescriptions (n=187)**

	<b>Model 3</b>		<b>Model 4</b>	
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	<i>b</i>	<i>p</i>	OR	95%CI	<i>b</i>	<i>p</i>	OR	95%CI		
<b>Intercept</b>	-1.71	<0.001	***	0.18	0.11-0.29	-1.59	<0.001	***	0.20	0.12-0.33
<b>Advocacy for IV drip</b>	2.04	<0.001	***	7.66	3.89-15.64	2.64	<0.001	***	14.03	5.77-38.70
<b>Physician resistance</b>						-1.03	0.03	*	0.36	0.13-0.88

Notes: † 0 '\*\*\*', 0.001 '\*\*', 0.01 '\*', 0.05.

The results revealed that compared to cases in which caregivers did not advocate for IV drip antibiotic treatment, physicians were over 14 times more likely to prescribe IV drip antibiotic treatment to patients, controlling for physicians' response to caregivers' advocacy (OR=14.03, 95%CI: 5.77-38.70,  $p < 0.001$ ). However, the effect of physicians' resistance to caregivers' advocacy for IV drip treatment was smaller on IV drip antibiotic prescriptions than on antibiotic prescriptions in general. Compared to cases in which physicians granted caregivers' advocacy for IV drip antibiotic treatment, the likelihood of IV drip antibiotic treatment being prescribed to patients was reduced by 64%, controlling for caregivers' advocacy.

#### 4.4 Discussion

In this chapter, I focused on the question: 'To what extent do physicians' prescribing behaviors contribute to antibiotic over-prescribing in China? My findings showed that (1) the physicians did not promote antibiotic treatment as hard as one would expect to see (in 40% of their initial treatment recommendations); (2) the physicians did not promote antibiotic prescriptions in a way that displayed a high level of authority in mandating the caregivers' acceptance of their recommendations; (3) in contrast, although discussions of treatment options were conventionally considered as within the physicians' domain of expertise, the caregivers initiated discussions of treatment plans in a considerably large proportion of the visits (21%), and among them, drip antibiotic treatment accounted for 81% of the cases; lastly, (4) when looking at the physicians'

responses to the caregivers' overt advocacy for antibiotic treatment, it was found that the physicians more frequently resisted it (65%) than granted it (35%).

In addition, results from multivariate logistic regression models that take into account caregivers' advocacy for antibiotic treatment and physicians' responses to caregivers' treatment advocacy showed that caregivers' advocacy significantly increased the likelihood of antibiotic prescribing, and their advocacy for IV drip antibiotic treatment has an even stronger effect on physicians' IV drip antibiotic prescriptions. On the other hand, the results also showed that physicians' response to caregivers' advocacy for antibiotic treatment also had a significant impact on the prescribing outcome – in cases where physicians resisted caregivers' treatment advocacy, the likelihood of antibiotics being ultimately prescribed to patients decreased by 77% for antibiotics and 63% for IV drip antibiotics.

These findings thus provide evidence from different angles that the high prevalence of antibiotic over-prescription in the Chinese pediatric context is not solely driven by supply-side or demand-side. Specifically, while the physicians did not recommend antibiotics to the patients in an unreasonably high percentage of cases, their responses to caregivers' treatment advocacy for antibiotic treatment demonstrated some degree of resilience. However, in an environment where caregivers' pressure is more pervasive and more overt compared to the US (as seen in Chapter 3), the percentage of antibiotics in their ultimate prescriptions increased greatly from that of their original treatment recommendations.

In addition, the findings from this chapter also demonstrate that in the Chinese pediatric encounters, caregivers and physicians orient to a relatively lower level of physicians' medical authority over treatment decisions compared to similar settings in the US. This can be seen in both caregivers' behaviors and physicians' behaviors in the interactions. On the one hand, caregivers displayed an orientation to a high level of agency and entitlement in their actions – (1) more overt

forms and higher frequency of treatment advocacy as described in Chapter 3, (ii) relatively common initiation of discussions of treatment plans, as well as (iii) relatively frequent resistance to physicians' treatment recommendations, as seen in this chapter. On the other hand, physicians also display an orientation toward a rather symmetrical social relationship with the caregivers, if not more deference to caregivers' rights in their own prescribing behaviors, as evidenced by the fact that (i) they use authoritarian actions to recommend antibiotic treatment much less frequently than the American physicians, and (ii) they display an even lower level of authority when they make recommendations for antibiotic treatment than non-antibiotic treatment.

Such an understanding of the physician-caregiver relationship in this particular setting is important, because in a context where shared-decision-making in the clinic context is increasingly called for, given the trends of consumerism and marketization, setting the boundaries of rights and obligations between physicians and patients can be hard and is consequential for patients' health outcomes. In the case of antibiotic prescribing, physicians' abdication of medical authority by catering to patients' caregivers' preferences and desires leads to overuse and inappropriate use of antibiotics and bacterial resistance at the population-level, which goes beyond individuals. In sum, the findings in this chapter suggest that intervention measures to reduce antibiotic over-prescribing will only be effective if they take into account both supply-side factors and demand-side factors.

## Chapter 5

### Discussion

#### 5.1 Introduction

Motivated by the gap in our understanding of contributors to antibiotic over-prescribing in China, this dissertation initially set out to focus on the role of demand-side factors in antibiotic over-prescribing in the Chinese pediatric setting. Yet a more detailed examination of the social and policy context, and of the interactional process between physicians and caregivers on antibiotic prescribing in particular, revealed that the over-prescribing issue needs to be understood as one in which physicians and caregivers respond to each other, as well as to the social and policy context in which they are situated. I discuss my primary findings and their implications in the following areas.

#### 5.2 Demand-side factors: Caregiver desire and pressure for antibiotic prescriptions

First, prevalent use of non-prescribed antibiotics among caregivers for their children's common cold symptoms contributes to the overuse and inappropriate use of antibiotics. My findings in Chapter 2 that showed that caregivers commonly used non-prescribed antibiotics before they took their children to visit physicians. These findings echo the existing research on the high prevalence of antibiotic self-medication in China (Bi, Tong, & Parton, 2000; Lv et al., 2014). Additionally, in line with Bi and colleagues' findings (2000) that older child age predicted a higher likelihood of self-medication behavior, my study also showed similar results. Relatedly, although my survey study did not specifically examine caregivers' knowledge of antibiotics, nonetheless, it revealed that caregiver higher educational attainment was significantly associated with a lower likelihood of caregiver use of non-prescribed antibiotics, echoing Lv and colleagues' (2014) findings that caregivers' higher knowledge of antibiotics predicted a lower likelihood of self-medication

behavior. Apart from child age and caregiver education, my study also identified caregiver place of residence as a significant predictor of antibiotic self-medication – compared to respondents residing in urban and developed areas, those living in less urban and developed areas were significantly more likely to use non-prescribed antibiotics before their visit and were more likely to report a desire for antibiotic prescriptions during the medical visit. These findings thus have important implications for developing effective intervention measures among key population groups to reduce antibiotic overuse.

Second, in Chapter 2, I found that the high prevalence of antibiotic self-medication not only constituted an important contributor to the irrational use of antibiotics but was also related to physicians' over-prescribing in the clinical context. Results from mediation analysis showed that caregivers' pre-visit antibiotic self-medication behavior was not only directly associated with their desires for antibiotic prescriptions in the medical visit, but also indirectly associated with physicians' antibiotic prescribing during the visit. These findings thus highlight the role of demand-side factors, i.e., their health-seeking behaviors and attitudes, in antibiotic overuse in both the clinical context and community setting. Effective enforcement of policies regulating access to non-prescribed antibiotics is strongly recommended.

Third, antibiotic over-prescribing is also attributable to caregivers' pressure for antibiotic prescriptions in clinical interactions. Besides examining the role of caregivers' pre-visit behaviors and attitudes related to the use of antibiotics, I also investigated caregivers' behaviors used to communicate their desires in naturally occurring pediatric interactions in Chapter 3. Evidence from both qualitative and quantitative analysis of caregivers' actions in medical encounters showed that caregivers not only communicated their desire for antibiotics frequently, but also their desire was often communicated rather overtly in medical interactions. When caregivers advocated for antibiotics in medical interactions, physicians were over 9 times more likely to prescribe antibiotics;

moreover. This thus suggested that when physicians prescribed in Chinese pediatric encounters, they faced a substantial amount of pressure from caregivers for antibiotic prescribing.

Furthermore, my findings also echo the existing finding with respect to the alarming incidence of antibiotic prescriptions in IV drip modality (Li et al., 2012; Reynolds & McKee, 2011; Yuan, 2014). Both qualitative and quantitative evidence pointed to the fact that in the Chinese pediatric context, caregivers not only have a preference for antibiotics in the IV drip modality, their treatment advocacy in medical interactions were mostly about IV drip antibiotic prescriptions. When examining the effect of caregiver advocacy for antibiotics on the prescribing outcome, it was found that caregiver advocacy for antibiotic treatment has a stronger effect on physicians' IV drip prescriptions – when caregivers advocated for IV drip antibiotics, physicians were 14 times more likely to prescribe IV drip antibiotics to patients. Thus, this finding further highlights the importance of reducing antibiotic prescriptions, and particularly, in IV drip treatment modality.

### **5.3 Supply-side factors: Physician prescribing under pressure**

It should be noted that although my findings showed that demand-side factors, i.e., caregiver attitudes and behaviors, significantly contributed to antibiotic over-prescribing in the Chinese pediatric clinical setting, they should not be interpreted as the sole contributors to the problem. The findings in Chapter 4 showed that physicians' prescribing behaviors at least partially contributed to the high prevalence of antibiotic over-prescription in the Chinese pediatric setting by responding to caregiver treatment advocacy. Although physicians did not “sell” antibiotics to patients by frequently and enthusiastically recommending them to patients, they nevertheless oriented toward antibiotics as negotiable with caregivers and gave in to caregivers' pressure for antibiotic prescriptions in many cases. The result that antibiotics were initially recommended to patients 40% of the time but were ultimately prescribed to patients 59% of the time suggests that even when

physicians do not initially set out to recommend antibiotics to patients, they may still end up prescribing them, most likely due to caregivers' treatment advocacy. When examining the effect of physicians' responses to caregivers' advocacy for antibiotic treatment on antibiotic prescriptions, the results further showed that (1) physicians more frequently resisted caregivers' advocacy than granted it in their initial responses (65% vs. 35%); and (2) their resistance to caregivers' advocacy had a significant effect on the ultimate prescribing outcome – in cases where physicians resisted caregivers' treatment advocacy, the likelihood of antibiotic prescribing was reduced by 77%. These results suggest that physicians did not drive antibiotic prescribing enthusiastically, yet over-prescribing can and does result from their responses to caregivers' treatment advocacy.

It was also worth noting that between 2011-2013, a number of hospitals in 16 cities were selected as pilot sites to experiment on the effect of incentives structure reform as a part of the major health system reform since 2009. The primary objective of the reform was to reduce the proportion of drug expenditure as a share of total health expenditure. Although it was not part of my research design, it turned out that data in my data set fell into two types in terms of hospital setting: (1) hospitals with incentive structure reform (54% of acute visit data), (2) hospitals without incentive structure reform (46% of acute visit data). After examining the difference in physicians' prescribing behaviors in terms (i) percentage of antibiotics in initial treatment recommendation, (ii) resistance to caregiver advocacy, and (iii) antibiotic prescribing rates, there were no significant associations detected between the two settings. There are two plausible explanations: (1) financial incentives did not affect physicians' prescribing behaviors as most existing literature argued, or (2) the reformed incentive structures did not affect physicians' prescribing behaviors as they were supposed to. Since I did not have access to information regarding the specific measures of incentive structure reform at the two pilot hospital sites and it was unclear whether the new incentive structure removed the perverse incentives that were tied to drug prescribing, especially antibiotic



prescribing, I cannot draw any definite conclusion about these theories.

Therefore, my findings that (1) caregiver advocacy for antibiotic treatment significantly contributed to antibiotic prescribing, and (2) physicians did not promote antibiotics to patients enthusiastically but might prescribe more than necessary by responding to caregivers' advocacy were in line with the previous findings on physicians prescribing under pressure from Western high-income countries (John Heritage, Elliott, Stivers, Richardson, & Mangione-Smith, 2010; Linder & Singer, 2003; Macfarlane, Holmes, Macfarlane, & Britten, 1997; R Mangione-Smith et al., 2001, 2004; R Mangione-Smith, Elliott, Stivers, McDonald, & Heritage, 2006; R Mangione-Smith et al., 2006; Rita Mangione-Smith et al., 2015; Stivers, 2002, 2007; Stivers, Mangione-Smith, Elliott, McDonald, & Heritage, 2003). Thus, it is also recommended that intervention efforts address demand-side factors, which have been less understood and attended to.

Relatedly, what was also implicated in my findings was the role of policy changes and the social environment in shaping population health outcomes (i.e., antibiotic over-prescription and bacterial resistance). In reviewing the historical context and the status quo of the health system and the policy imperatives related to antibiotic prescribing, from the Mao era (1949-1978) to the post-Mao era (1979-2009), I found that policy changes and incentive structures had a profound effect on shaping individual-level attitudes and behaviors among physicians and caregivers. Specifically, since the dawn of the post-Mao era in 1979, the health system has undergone enormous transformations shifting from a centrally-planned system toward an increasingly market system. This policy change has greatly influenced physicians' prescribing and patients'/caregivers' health-seeking attitudes and behaviors. As a result, a medical culture that is characterized by the excessive provision of and expectation of services was shaped and now seems hard to eradicate. This process and its associated consequences are similar to that of medicalization in American society, in which the medicalization process is increasingly more driven by commercial and market interests rather than by professional

claim-makers (Conrad, 1975, 2005; Conrad & Leiter, 2004; Kravitz et al., 2005; Timmermans & Buchbinder, 2010).

### **5.3 Taken together: Physician-patient/caregiver relationship and over-prescribing**

When we take together physicians' and caregivers' social actions in the medical interactions, another implication of my findings is concerned with the physician-caregiver relationship and its consequences for antibiotic over-prescribing. The findings showed that, on the one hand, caregivers frequently and overtly advocated for antibiotic prescriptions, thus displaying their orientation toward their high entitlements and shared rights in antibiotic treatment decision-making; on the other hand, physicians prescribed in a low-authoritarian style, demonstrating their orientation toward antibiotic treatment decisions as negotiable and toward caregivers as having rights in treatment decisions. Such a relatively symmetric distribution of rights and obligations between physicians and caregivers in prescribing decisions, although they may appear promising for positive patient satisfaction, though in fact such a correlation is not inevitable (Mangione-Smith et al., 2001), can be essentially problematic in cases such as antibiotic prescribing, where physicians should uphold their professional authority in gatekeeping inappropriate prescriptions. Thus, careful deliberation on the boundaries of physician-patient rights and obligations in the clinical setting is important for improved health service outcomes, including both higher patient satisfaction and reduced antibiotic over-prescribing.

In addition, findings in this dissertation also shed light on the similarities and differences between China and the US in terms of antibiotic over-prescribing practices. Using a comparative conceptualization and research design based on the pioneering research from the American pediatric setting (Mangione-Smith et al., 2006, 2006; Mangione-Smith et al., 2015; Stivers, 2002, 2007, Stivers et al., 2017, 2003), my results revealed that, first, compared to the American system, physicians in

the Chinese pediatric setting faced a substantially greater amount of pressure from caregivers for antibiotic prescribing; second, the type of antibiotic treatment modality being advocated for by the caregivers was also strikingly different in the two countries – while American caregivers primarily negotiated with their physicians for oral antibiotics, Chinese caregivers primarily advocated for IV drip antibiotics; lastly, physicians and caregivers in the two countries also displayed rather different orientations toward their relative rights and obligations in treatment decisions, hence their different orientations toward the physician-patient relationship and professional authority in medical institutions. Understanding these nuanced differences between the two countries in antibiotic over-prescribing practices is important for identifying key areas for improvement and developing tailored intervention measures.

#### **5.4 Limitations**

There are several limitations related to the research design of this study. First, due to difficulties in data collection, the survey study on caregiver use of non-prescribed antibiotics and their desire for antibiotic prescriptions prior to their medical visits (Chapter 2) was not conducted among the same participants of the study on physician-caregiver interaction in pediatric encounters (Chapter 3 and Chapter 4). Although the results would not likely be much different if the survey study was conducted among the caregivers whom we video-recorded and analyzed in terms of their interactional behaviors, future research that links participants' pre-visit health-seeking behaviors and attitudes to their interactional behaviors in the visit has the potential to yield additional important findings. Relatedly, in the study of physician-caregiver behaviors in medical interactions, I did not collect the socio-demographic information of the patients and their caregivers, nor did I collect clinical information related to the visits such as diagnosis, prescriptions, and expenses that were

input into the electronic medical record system; future research that takes into account such information is also likely to produce important findings.

Second, the sampling method that we used in the studies was purposive sampling. Thus the samples were not random, and results should be interpreted with caution. Although a non-probability sampling method was used, we aimed to provide more generalized findings by combining the purposive sampling method with multi-stage and stratified sampling methods. Specifically, in the community-based survey, we recruited participants in multiple geographic sites across the country that were sorted into four tiers based on their administrative classification and different levels of socio-economic development, including both urban areas and rural areas. In the studies of physician-caregiver interaction in the clinic settings, we recruited physicians and caregivers from all three tiers of healthcare institutions in the country's health service delivery system, including tertiary hospitals, secondary hospitals, and community health centers in urban settings. The findings from the studies thus were not restricted to one or a few particular settings.

## **5.5 Contributions**

In sum, this dissertation potentially contributes to the existing literature in the following ways: First, this study is among the first to systematically examine physician-patient/caregiver treatment advocating actions in medical interactions and the effects of demand-side factors on antibiotic over-prescribing in China. Although the high prevalence of the antibiotic over-prescribing problem has drawn a lot of research attention in recent years, the existing studies have predominantly focused on supply-side factors and thus have directed intervention efforts to reform supply-side incentive structures. Findings from this dissertation thus provide a better understanding of the problem by highlighting the role of demand-side factors in antibiotic prescribing.

Second, using mixed methods, this dissertation provides both quantitative and qualitative evidence to support the argument that demand-side factors play an important role in the antibiotic over-prescribing problem. Specifically, findings from the survey study presented quantitative evidence of the associations among caregivers' pre-visit self-medication behavior, their desires for antibiotic prescriptions, and the prescriptions they receive from physicians in medical visits; whereas findings from the conversation analytic study of physician-caregiver interactions explicated the process through which the over-prescribing of antibiotics was enacted in medical encounters. Thus, on the one hand, the findings provide a quantifiable estimation of the associations between caregiver self-reported behaviors and attitudes and physicians' antibiotic prescriptions; while on the other hand, they also provide insights into how antibiotic over-prescriptions can be reduced by improving specific physician-caregiver interactional behaviors.

## **5.6 Action recommendations**

To conclude, based on these findings, I thus make the following action recommendations: First, policy and regulations regarding retail sales of antibiotics (including both sales by street vendors and those on online retail markets) should be strictly enforced. Given the high prevalence of self-medication with antibiotics in the community setting and findings that this behavior is associated with shorter courses of treatment than is standard and inappropriate choices of drugs and dosage, all likely resulting in treatment failure and antibiotic resistance (Morgan et al., 2011), if this contributor to antibiotic overuse is not addressed, any efforts that aim to reduce resistance rates through reducing over-prescription in the clinical setting would become futile.

Second, health education campaigns that aim to improve public knowledge about the rational use of antibiotics should be launched and priority should be given to key population groups

such as caregivers who have lower educational attainment, have older children, and reside in less urban and developed regions.

Third, intervention measures such as antibiotic stewardship can be implemented to promote rational antibiotic prescribing. Studies in various settings have shown the positive effects of measures such as providing physicians with clinical guidelines, on-site training, or computerized clinical decision-aid systems in reducing prescription rates (Huang et al., 2017; Sharp et al., 2017; Wei et al., 2017; Zou et al., 2014). These practices can be used more broadly across health institution settings.

Last but not the least, training physicians in communication skills for prescribing and responding to caregiver treatment advocacy has the potential to yield positive results in reducing antibiotic prescribing. Clinic-based studies have shown that physicians' communication practices such as deploying online commentary during physical examinations (Heritage & Stivers, 1999; Heritage et al., 2010; Mangione-Smith, Stivers, Elliott, McDonald, & Heritage, 2003), using positive-format treatment recommendation delivery formats (Stivers, 2005), as well as providing future contingency plans when recommending non-antibiotic treatments can effectively reduce the likelihood of inappropriate prescribing (Mangione-Smith et al., 2015). Given my findings that physicians' antibiotic prescribing was found to be significantly associated with caregivers' advocacy, and that physicians' resistance significantly reduced the likelihood of antibiotic prescribing, these communication practices can be incorporated into the process of clinical interaction to effectively shape caregiver prescription expectations.

## **APPENDIX 1**

### **Questionnaire of Caregiver Pre-visit Behavior and Attitudes [Chinese version]**

## 医患用药行为调查研究

我们想调查您的孩子最近一次因感冒/发烧/咳嗽/流鼻涕等症状去医院就诊的经历:

1) 请选择就诊种类 (在合适的选项前打✓):

初诊 (症状为新近出现, 未经医生诊疗)       复诊 (已经医生诊疗)

2) 您的孩子的年龄: \_\_\_\_\_

3) 您的孩子有以下哪些症状 (可多选):

发烧       流鼻涕       嗓子痛       呕吐  
 咳嗽       气喘       肚子痛       食欲不好  
 其它\_\_\_\_\_

4) 去医院就诊之前, 您是否已经使用以下药物帮助孩子控制病情:

口服药-非消炎类       口服药-中药消炎类       口服药-西药消炎类  
 其它\_\_\_\_\_       未使用任何药物

5) 去医院就诊, 您希望医生为您的孩子做以下哪些 (可多选):

身体检查       开口服药-非消炎类       告知诊断结果  
 开口服药-中药消炎类       挂水-消炎类       告知病因  
 开口服药-西药消炎类       挂水-非消炎类       告知缓解病情方法  
 无特别期待, 听从医生建议       其它\_\_\_\_\_

6) 此次就诊, 医生是否为您的孩子使用了消炎类药物:

口服-西药消炎类       挂水-消炎类  
 口服-中药消炎类       未使用任何消炎类药物

7) 您在此次就诊经历感受如何 (请在答案上打✓):

	很差	较差	一般	较好	很好
1. 医生的技术水平.....	1	2	3	4	5
2. 医生的服务态度.....	1	2	3	4	5
3. 与医生交流的时间.....	1	2	3	4	5
4. 就诊的等候时间.....	1	2	3	4	5
5. 诊疗服务及药品的费用.....	1	2	3	4	5

8) 您与孩子是什么关系:  母子(女)       父子(女)       其他\_\_\_\_\_

9) 您的最高学历:

初中及以下       高中       专科       本科       硕士及以上

10) 您的家庭月收入:

2000 以下       4000-5900       8000-9999  
 2000-3999       6000-7999       10000 以上

11) 孩子的医疗保险种类:

学少医疗保险       商业医疗保险  
 社会基本医疗保险       无保险

12) 您的年龄: \_\_\_\_\_

13) 您的职业: \_\_\_\_\_



## **APPENDIX 2**

### **Questionnaire of Caregiver Pre-visit Behavior and Attitudes [English translation version]**

## Survey of Doctor-Patient Medication Use Behavior

We would like to learn about your child's MOST RECENT medical visit experience for cold-like problems.

1) Please choose the type of visit (Put  in front of the right answer):

- New visit                       Follow-up visit

2) Please tell us the age of your child: \_\_\_\_\_

3) What symptoms did your child have (you can choose more than one item):

- Fever                       Runny nose                       Sore throat  
 Vomit                       Cough                       Short of breath  
 Stomach ache     Loss of appetite Other: \_\_\_\_\_

4) Before your visit, did you use any of the following medicine to manage your child's problem? (You can choose more than one item):

- Oral non-antibiotic medicine                       Oral Chinese anti-inflammatory medicine  
 Oral western antibiotic medicine                       Other: \_\_\_\_\_  
 None

5) Before your visit, what did you expect your doctor to do (you can choose more than one item):

- Physical examination                       Non-antibiotic medicine                       Cause of illness  
 CN oral anti-inflammatory                       Drip – antibiotic                       Diagnosis  
 Western oral antibiotics                       Drip – non-antibiotics                       Symptom medicine  
 Other: \_\_\_\_\_                       Nothing particular

6) What antibiotic treatment did the doctor put your child on? (You can choose more than one item):

- Chinese oral anti-inflammatory medicine                       Western oral antibiotics  
 Drip                       None

7) We would like to learn about your perception of the medical visit:

(Please tick on the appropriate answer)	Awful	Bad	Ok	Good	Excellent
a. Doctor's professional skills.....	1	2	3	4	5
b. Doctor's service attitude .....	1	2	3	4	5
c. Communication time with doctors .....	1	2	3	4	5
d. Waiting time .....	1	2	3	4	5
e. Expenses for services and medicine .....	1	2	3	4	5

8) Your relationship with the child:

- Mother                       Father                       Other \_\_\_\_\_

9) Your education level:

- Middle school and below                       High school                       Associate degree                       College degree  
 Master degree and above

10) Monthly income of your family:

- Below 2000                       4000-5999                       8000-9999  
 2000-3999                       6000-7999                       10000 above

11) Insurance of your child:

- School children insurance                       Commercial medical insurance                       Social basic insurance  
 No insurance                       Others \_\_\_\_\_

12) Your age: \_\_\_\_\_

13) Your occupation: \_\_\_\_\_

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