



# Contextual influence on condom use in commercial sex venues: A multi-level analysis among female sex workers and gatekeepers in Guangxi, China



Yiyun Chen <sup>a,\*</sup>, Xiaoming Li <sup>b</sup>, Zhiyong Shen <sup>c</sup>, Yuejiao Zhou <sup>c</sup>, Zhenzhu Tang <sup>c</sup>,  
Tania B. Huedo-Medina <sup>d</sup>

<sup>a</sup> Department of Psychology, University of Connecticut, Storrs, CT, USA

<sup>b</sup> Carman and Ann Adams Department of Pediatrics, Prevention Research Center, Wayne State University School of Medicine, Detroit, Michigan, USA

<sup>c</sup> Guangxi Center for Diseases Control and Prevention, Nanning, Guangxi, China

<sup>d</sup> Department of Allied Health Sciences, University of Connecticut, Storrs, CT, USA

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## ABSTRACT

This study aims to assess the influence of commercial sex venues on consistent condom use among female sex workers (FSWs) and to examine associations between individual and venue level factors and consistent condom use with clients. Analysis was based on a sample of 637 FSWs and 123 gatekeepers from 51 venues in Guangxi, China. Multi-level logistic regression using Bayesian simulation via Markov Chain Monte Carlo was applied to investigate whether FSWs' individual propensity to use condom with clients was statistically dependent on the venue of working. Multi-level modeling revealed considerable variability across venues in the likelihood of consistent condom use with clients among FSWs. Characteristics at both individual and venue levels helped to explain the observed variation. Certain venue-level factors exerted their influence on condom use over and above the effect of individual-level characteristics. The contextual influence exerted on condom use behaviors among FSWs may imply a potential to harness the path to individual behaviors from a higher and more dominant level, and shed light on the design of more effective sexual risk reduction intervention among venue-based FSWs.

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## 1. Introduction

In the search for factors related to poor health behaviors, an increasing attention has been given to the importance of the connections between individuals and contextual settings which shape individual behaviors (Duncan et al., 1998). The unequivocal evidence of variation in individual health-related behaviors between different social settings or “context” has led to the acknowledgement of multi-level influences that can be exerted on individual behaviors (Britton, 1990; Macintyre, 1986). The observed variability of behaviors across settings may be accounted for by the characteristics at individual level, and by the “contextual” effect associated with external social and physical environment. The latter effect may arise from extra-individual processes that do not necessarily reflect individual choices (Suzuki et al., 2012). A comprehensive

\* Corresponding author at: 406 Babbidge Road, Unit 1020, Department of Psychology, University of Connecticut, Storrs, CT 06269, USA.  
E-mail address: [star.chen@uconn.edu](mailto:star.chen@uconn.edu) (Y. Chen).

understanding of contextual level influence on health risk behaviors such as unprotected sex may help to increase the effectiveness of relevant interventions (Wellings et al., 2006).

Venue-based sexual risk reduction among female sex workers (FSWs), a population at elevated risk for infection and transmission of HIV and other sexually transmitted infections (STIs), has aroused much attention in the field of HIV/STIs behavioral prevention (Pitpitan et al., 2013). However in contrast to an increasing evidence that points to the variation in sexual risk behaviors by sex work venues (Safika et al., 2013), there has been an apparent paucity of attempts by researchers to explore the contextual influence at venue level (Pitpitan et al., 2013). As sex workers are often affiliated with a commercial sex venue (i.e., venue-based), their behaviors are highly subject to the influence of people who supervise their work (Huang et al., 2004a,b; Xia and Yang, 2005) and reinforcement by cultural norms within the venue (Hong et al., 2008). Moreover, the illegality and secrecy of sexual transaction in certain countries further enhanced FSWs' social isolation and their dependency on the place of work for resources and protection (Chen et al., 2013). Sex work venues, as a result, form an appropriate unit of analysis to incorporate elements that reflect contextual impact on sexual risk among FSWs.

Among contextual level factors identified in sex work venues, the role of gatekeepers has been repetitively proposed as a critical structural element to affect FSWs' behaviors (Chen et al., 2012; Li et al., 2010b). Gatekeepers in commercial sex industry refer to individuals who manage sex workers, commonly known as madams, managers, bosses, brothel owners or pimps (Yang et al., 2005). They not only act as intermediaries of sex trade, but also as protectors for sex workers (Kerrigan et al., 2003; Morisky et al., 2005; Zhang et al., 2013). Gatekeepers are the point personnel in a venue that take charge of the complex interactions between FSWs and other relevant social parties (e.g. clients, law enforcement authorities, health professionals, etc.). The highly imbalanced gatekeeper-FSWs-power relationship, consolidated by institutional factors like stigmatization and criminalization, renders gatekeepers with undue control and influence over FSWs. Their attitudes and preference, which could be easily turned into venue-level norms and policies, sits at the core of structural-level factors that exert influence over FSWs' behavioral choices. Previous studies found FSWs' perception of gatekeepers' attitude and support for condom use positively associates with consistent condom use with clients (Li et al., 2010a). Gatekeepers who provide condoms in the workplace contribute to increased condom use (Morisky et al., 2006). In contrast, lack of gatekeeper support and abusive relationships with gatekeepers both interfered with consistent condom use (Yang et al., 2005). However in none of the previous studies, gatekeepers' information was actually obtained directly from gatekeepers. Instead, relevant measures of gatekeepers were retrieved indirectly through FSWs, an approach that may reduce the accuracy of the measures.

In response to the insufficient understanding of the contextual influences of sexual risk behaviors among FSWs and the absence of direct measures from gatekeepers of sex work venues, the current study adopted a multi-level analytical approach utilizing information obtained directly from gatekeepers, to decompose the influence on sexual risk behaviors into corresponding levels. We used a sample of FSWs and gatekeepers recruited in China, a country that has experienced a resurgence of commercial sex since early 1980s along with its economic development. Commercial sex is illegal in China despite the fact that it has grown into a full-blown business. Although sex workers and clients can only be caught "at the scene" according to the law, sex workers are still under threat of periodic strike-down campaign from the government (Tucker et al., 2010). While accurate numerations of commercial sex venues and FSWs are not available, the estimated number of FSWs is between 1 to 10 million in China (Hong and Li, 2008; Huang et al., 2004a,b).

Based on existing literature regarding contextual influence on personal behaviors, we assume that there will be a substantial variation in sexual risk behaviors across different venues, and such variability can be explained by the personal-level characteristics of FSWs as well as factors operationalized at the venue level. In addition, venue-level factors may exert influence on sexual risk behaviors over and above personal-level attributes. We would test these assumptions by decomposing individual and contextual level influence on FSWs condom use behaviors in the current study.

## 2. Method

### 2.1. Participants and procedures

Participants were recruited from two famous tourist cities in Guangxi, China. There were an estimated 2000 FSWs in approximately 150 commercial sex venues in each city. Commercial sex industries in two cities are similar in terms of their size and structure. Our recruitment covered a range of different types of commercial sex settings, including night clubs, hotels, saunas, karaoke, bars, hair salons, and massage parlors. In collaboration with local centers for disease control and prevention (CDC), we used a two-stage convenience sampling strategy. The first stage of recruitment was carried out at the venue level, and after obtaining consent from venue owners and relevant gatekeepers, we continued with second stage recruitment of FSWs within each venue. In proportion to the size of venues, we recruited more participants in certain larger venues such as night clubs and recreational centers that typically have hundreds of FSWs than in other smaller venues (e.g. hair salons, massage parlors, etc.) which usually only have a few to a dozen of FSWs. Participants who consented to participate were asked to complete a self-administered questionnaire, which was specifically tailored to each group (FSWs or gatekeepers). The survey was carried out in a private room or space at the participating venues and trained interviewers were available to provide assistance upon requests. The interviewers were local CDC staff who had experience in working with FSWs and their gatekeepers. All interviewers received intensive training on research ethics and interview skills prior to the field data collection. The study protocol was approved by the Institutional Review Boards at the Wayne State University

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