

# Social Network Approaches to Recruitment, HIV Prevention, Medical Care, and Medication Adherence

Carl A. Latkin, PhD,\* Melissa A. Davey-Rothwell, PhD,\* Amy R. Knowlton, ScD,\*  
Kamila A. Alexander, PhD,† Chyvette T. Williams, PhD,‡ and Basmattee Boodram, PhD‡

**Abstract:** This article reviews the current issues and advancements in social network approaches to HIV prevention and care. Social network analysis can provide a method to understand health disparities in HIV rates, treatment access, and outcomes. Social network analysis is a valuable tool to link social structural factors to individual behaviors. Social networks provide an avenue for low-cost and sustainable HIV prevention interventions that can be adapted and translated into diverse populations. Social networks can be utilized as a viable approach to recruitment for HIV testing and counseling, HIV prevention interventions, optimizing HIV medical care, and medication adherence. Social network interventions may be face-to-face or through social media. Key issues in designing social network interventions are contamination due to social diffusion, network stability, density, and the choice and training of network members. There are also ethical issues involved in the development and implementation of social network interventions. Social network analyses can also be used to understand HIV transmission dynamics.

**Key Words:** social networks, HIV prevention, health disparities, diverse populations

(*J Acquir Immune Defic Syndr* 2013;63:S54–S58)

Social network members may influence individual HIV/sexually transmitted infection risk behaviors that facilitate infection transmission.<sup>1–3</sup> HIV-related behaviors are embedded in dynamic social structures, or networks, that link individuals to others through interactions. Network characteristics, such as size, composition, and density, have been found to be associated with HIV risk behaviors that include sharing injection equipment, drug use cessation,<sup>4–7</sup> having multiple concurrent sexual partnerships, unprotected sex, and exchanging sex for money or drugs.<sup>8–11</sup> Social network analyses have been used to explain demographic disparities in HIV/AIDS burdens among African Americans compared with other racial groups in the United

States,<sup>12</sup> the role of social capital on HIV risk behavior among injection drug users (IDUs),<sup>13,14</sup> and how overlap of drug and sexual networks foster gender differences in HIV risk.<sup>15</sup> Social network approaches have also been developed for HIV prevention interventions to reduce risk behaviors.<sup>13,16–20</sup>

## NETWORK DYNAMICS

Most network studies to date are cross-sectional, yet network membership and relationships are dynamic over the life course.<sup>21,22</sup> Although the HIV prevention literature spans the age spectrum, network analyses have largely ignored the mechanisms by which many risky health behaviors become normative during adolescence and endure through adulthood.<sup>22</sup> Indeed, network changes may occur in the intensity, function, and frequency of interaction—all of which have important implications for both the spread and prevention of HIV. For example, network instability or turnover in IDUs' network ties has been shown to promote HIV transmission.<sup>23</sup> Assessing social networks as dynamic entities requires both analytic models to account for structural and functional changes, and methods of data collecting that are amenable to modeling network changes over time.

## STRUCTURAL FACTORS AND SOCIAL NETWORKS

Social networks are located in physical and social spaces. Network members meet each other, live, and engage in risk behaviors in specific settings. Therefore, behaviors can profoundly effect and be affected by places in which they occur. Numerous studies have found public injecting among IDUs to be associated with higher risk injection practices.<sup>24</sup> On a larger scale, neighborhood factors, such as racial and socioeconomic segregation, may impact the availability of resources for network members. Gender norms influenced by incarceration patterns, drug use, and sex work may alter social ties and vulnerability to HIV transmission.<sup>25</sup> Furthermore, stigma resulting from these structural forces may limit network choices. Individuals in stigmatized groups may be hesitant to affiliate with persons who may disclose their stigmatized behaviors. Although structural factors have been hypothesized to influence social network dynamics related to HIV transmission and care, there is little empirical research on this topic.

## SOCIAL MEDIA, ELECTRONIC COMMUNICATIONS, AND SOCIAL NETWORKS

Participation in social media is a popular means for creating and maintaining network connections. In fact, most

From the \*Department of Health, Behavior, and Society, Johns Hopkins Bloomberg School of Public Health; †School of Nursing, University of Pennsylvania; and ‡Department of Epidemiology, School of Public Health, University of Illinois at Chicago.

Supported by the grants from the National Institutes of Health (R01DA016555 and R01DA022961). Additional support for the supplement was provided by R13 MH-081733-01A1.

The authors have no conflicts of interest to disclose.

Correspondence to: Carl A. Latkin, PhD, Johns Hopkins Bloomberg School of Public Health, 624 N. Broadway, Baltimore, MD (e-mail: clatkin@jhsph.edu).

Copyright © 2013 by Lippincott Williams & Wilkins

adults (77%) and nearly all teenagers (93%) interact online as of 2010.<sup>26,27</sup> Therefore, it is feasible to collect a wealth of social network data and deliver HIV/sexually transmitted infection interventions with minimal expenditures and unlimited geographic reach. Social media sites, such as Facebook, have highlighted the potential utility of social network approaches to HIV research, prevention, and care. For instance, social network sites may represent a convenient way to recruit participants for either face-to-face or online programs. However, research among African American and Hispanic men who have sex with men has found that recruitment using social media may lead to biased samples.<sup>28</sup>

Nonetheless, the use of social media sites by the public also elicits basic research questions about the nature of these social networks. For an individual who has 400 “friends” on Facebook, do all these friends influence behavior? What is the relative behavioral influence of social networking sites in comparison with face-to-face communication? What are the social network structures within a large social networking site that would be most effective to target? How does information and behavior change diffuse within these types of social networks? Chiasson et al<sup>29,30</sup> have discussed a range of methodological and ethical challenges that researchers who utilize the Internet for recruitment and intervention delivery should consider. It is likely that future social network interventions will combine programs that utilize both face-to-face and online approaches.

## **VOLUNTEER COUNSELING AND TESTING AND SOCIAL NETWORKS**

Almost one fourth of those living with HIV are unaware of their status.<sup>31</sup> Recent studies have found that only about half of urban at-risk African American men have been tested for HIV in the previous year.<sup>32,33</sup> Effective strategies to identify new HIV infections are imperative because those unaware of their HIV infection status are thought to be the source for more than half of all new infections.<sup>34</sup> Compared with partner notification, offering volunteer counseling and testing within identified social networks has been shown to be more efficient at identifying new HIV cases.<sup>35</sup> Network-based strategies can also alleviate some of the barriers to HIV testing.<sup>36</sup> Downing et al<sup>37</sup> found that peer support was a major motivator for HIV testing. Nonetheless, although some studies have begun using social network methodology to increase HIV testing, no randomized controlled trials (RCTs) have utilized social network approaches.<sup>38,39</sup>

## **SUPPORT NETWORKS, HIV MEDICAL CARE, AND MEDICATION ADHERENCE**

Social network members provide critical material resources (eg, transportation to medical appointments) and emotional support to people living with HIV, especially those who are impoverished. Social support is a consistent and strong predictor of health care utilization and medication adherence.<sup>40–42</sup> Moreover, the presence of specific network members (ie, sex partner) has been associated with earlier initiation of HIV medical care in a national US sample,<sup>43</sup> although having a large number of sources of support has

been associated with access to care among IDUs.<sup>44</sup> Additionally, there seems to be a differential impact of having a main partner by gender among impoverished populations, with having a main partner being associated with better adherence among men but worse adherence among women.<sup>45</sup> Peer support programs have been developed to promote HIV medication adherence.<sup>46–48</sup> An important question for such programs is whether to use existing social networks or to develop new network ties. The use of existing relationships is more likely to be sustainable than developing new relationships, yet it is likely that the effectiveness of these 2 different approaches will be context specific and a function of the ability of the current network to provide support for medication adherence.

## **SOCIAL NETWORKS AND MICROBIOLOGY**

It is possible to link different social networks through the genetic strain analyses and to examine the associated social network factors such as density, centrality, and betweenness with genetic strain factors.<sup>49,50</sup> Potentially, genetic strain analyses can be used to develop HIV prevention interventions based on pathways and infection dynamics. It may also be possible to examine how antiretroviral treatments may impede transmission through networks and whom in the network to target for maximum impact.

## **ISSUES IN SOCIAL NETWORK INTERVENTION STUDY DESIGN**

To date, it has been well-established that social networks can be used to promote HIV risk reduction. At-risk individuals can be taught how to spread risk reduction messages and behaviors within their social networks. An important issue with network intervention research is contamination, whereby individuals in the experimental intervention group talk to and encourage those in the control group to alter their behaviors. This scenario is more problematic with social network-based research than traditional RCTs developed for individual-focused interventions. For example, it is unlikely that a blood pressure medication will impact the blood pressure of network members. In contrast, HIV risk behaviors are most often social, and interventions are designed to alter the behaviors of more than one individual. Consequently, the differences between groups may be attenuated by contamination. One approach to minimize contamination is to conduct network interventions with groups that do not interact. Moreover, appropriate methods of evaluating behavior change interventions are needed for network research designs.

Small, dense networks that are peripheral and disconnected from other networks are ideal for RCTs when the network is the unit of analysis. For public health interventions, dense and highly connected larger networks are ideal for the diffusion of information and behavior change. In addition to network density, another key network factor is turnover. If there is rapid network turnover, it is unlikely that there will be sufficient interaction between network members for the diffusion of behavior change, but if there is no network turnover, then the amount of diffusion will be limited to existing ties.

## SOCIAL NETWORKS AND RECRUITMENT

One type of social network recruitment is through respondent-driven sampling (RDS). RDS approaches often recruit a more diverse sample than convenience sampling. There has been debate as to the biases of RDS and whether the assumptions that RDS are based upon are adequately met. RDS recruitment produces chains, yet the linkages between these chains are often unknown. Collecting network data concurrently with RDS recruitment may enhance our understanding of the structural social network features of RDS samples. An example of using a targeted network sampling approach to reach young injectors may include recruitment of older injectors to delineate the injectors in their social network using a network inventory and then request that they recruit younger injectors in their network. This process can continue until there is a plateau or the recruitment goals are met.

Another method of recruitment through social networks is the random walk method.<sup>51</sup> In this approach, once individuals delineate their networks, the investigator chooses at random 1 or more network members for the next stage of recruitment. This sampling technique has the advantage of true random selection of network members, but it may be limited in capacity to recruit those network members who are randomly selected.

## SOCIAL NETWORK INTERVENTIONS

Social network interventions tend to be cost-effective because they reach the people in the intervention and those individuals indirectly involved. Social network interventions tend to be sustainable when they are able to change social norms that are associated with both sex and drug behaviors.<sup>52–54</sup> Additionally, these interventions can serve a positive role for individuals who are members of disenfranchised and stigmatized groups in the community.

What are the best methods to utilize networks to promote HIV prevention? One approach aims to impede the spread of HIV by altering the network's structure. However, this approach may also inhibit the spread of information through the network. Therefore, network interventions may capitalize on existing social networks to disseminate behavior change. Another approach creates new social networks, such as online support networks and self-help groups. Qualitative studies suggest that online support groups are a viable avenue for people living with HIV to gain social support.<sup>55,56</sup>

When attempting to use networks to promote HIV prevention, it is important to probe the mechanisms of behavior change. This is critical for developing appropriate interventions. Are social networks conceptualized as channels through which information and behavior change flows? Or are they treated as reservoirs for social norms that influence behaviors? There is evidence that social networks can be used to change social norms and HIV-related risk behaviors, but less is known about the approaches to behavior change that are most effective at altering network-wide risk behaviors.

There are additional key research questions including whether network approaches will work in settings where major structural factors, such as access to clean injection

equipment or laws that prohibit and stigmatize same sex sexual behaviors, impede behavior change. Moreover, some individuals join specific social networks that define themselves in opposition to health promotion messages, such as barebackers, and hence these individuals may not be influenced by those network members who encourage risk reduction.

Social influence and information are key aspects of network-based behavioral interventions. However, individuals differ on receptivity to social influence. Some network members may have limited economic or social power to engage in risk reduction. On an individual level, mental health and substance use may influence risk behaviors and an individual's ability to change their risk behaviors. Given the multiple levels of direct and indirect influence on risk behaviors, social network interventions should not be viewed as simply substitutes for structural approaches or individual level interventions, but they can be used in conjunction with community-wide prevention activities.

## CURRENT MODELS OF SOCIAL NETWORK INTERVENTIONS

Social network-based interventions are designed to teach individuals about HIV risk reduction. These individuals then diffuse the information, behaviors, and skills to their network members. Two common network-based interventions in HIV prevention are Peer Education and Popular Opinion Leader.

The Peer Education model is based on the premise that individuals in all positions in a social network can influence other members and that every member can be trained in leadership, communication, and social influence skills. In this approach, individuals are trained to be peer educators who disseminate risk reduction information and resources to their social network members. This model has been successfully implemented with drug users, adolescents, and heterosexual women.<sup>16–19</sup> Interventions utilizing the Popular Opinion Leader identify key individuals who are trained in HIV risk reduction and then asked to spread this information to their peers. This model has been widely used with gay men in bar settings,<sup>20</sup> although some of the outcomes are mixed.<sup>57</sup>

## ETHICAL ISSUES

Social network analyses are not without ethical issues to consider.<sup>58</sup> A perennial issue relates to the types of information that can be ethically obtained about individuals who are listed as network members. During network intervention implementation, the question of who needs to consent to be involved in a network intervention study remains unanswered. Network interventions that use negative social influence approaches such as shame, ridicule, or embarrassment also present pervasive challenges. Furthermore, there is concern that peer educators may not follow researchers' scripts while promoting HIV prevention with their network members.

Social influence is a key approach for using social networks in encouraging HIV behavior change. But what if network members refuse to reduce high-risk behaviors? One alternative is to exclude or extrude high-risk individuals. Yet

will they simply join other networks and increase the level of risk in those networks?

## CONCLUSIONS

Social networks are a promising approach to sustainable and cost-effective behavior change and for reaching hidden populations. There is convincing evidence that risk behaviors are linked to network factors and that risk behaviors are clustered within networks. Although there has been great progress in social network research in HIV prevention and care, there remain major research questions to address. These questions include (1) how to most effectively harness the potentially powerful social influence processes within social networks; (2) how to best delineate the relationship between macrostructural factors and network dynamics; (3) discerning which models to assess network change over time; and (4) how to more fully understand HIV transmission dynamics. It is also important to ensure that our research methods are aligned with the complexities of social network dynamics. Social network approaches have the potential for harnessing powerful and sustainable programs that have substantial reach. The goal of the next generation of network interventions ought to be to optimally use the power of networks to reduce HIV transmission and optimize HIV medical care.

## REFERENCES

- Friedman SR, Neaigus A, Jose B, et al. Sociometric risk networks and risk for HIV infection. *Am J Public Health*. 1997;87:1289–1296.
- Perisse AR, Costa Nery JA. The relevance of social network analysis on the epidemiology and prevention of sexually transmitted diseases. *Cad Saude Publica*. 2007;23(suppl 3):S361–S369.
- Parker M, Ward H, Day S. Sexual networks and the transmission of HIV in London. *J Biosoc Sci*. 1998;30:63–83.
- Lakon CM, Ennett ST, Norton EC. Mechanisms through which drug, sex partner, and friendship network characteristics relate to risky needle use among high risk youth and young adults. *Soc Sci Med*. 2006;63:2489–2499.
- Bohnert AS, Bradshaw CP, Latkin CA. A social network perspective on heroin and cocaine use among adults: evidence of bidirectional influences. *Addiction*. 2009;104:1210–1218.
- Neaigus A, Friedman SR, Jose B, et al. High-risk personal networks and syringe sharing as risk factors for HIV infection among new drug injectors. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1996;11:499–509.
- Latkin CA, Kuramoto SJ, Davey-Rothwell MA, et al. Social norms, social networks, and HIV risk behavior among injection drug users. *AIDS Behav*. 2010;14:1159–1168.
- Barrington C, Latkin C, Sweat MD, et al. Talking the talk, walking the walk: social network norms, communication patterns, and condom use among the male partners of female sex workers in la Romana, Dominican Republic. *Soc Sci Med*. 2009;68:2037–2044.
- El-Bassel N, Gilbert L, Wu E, et al. A social network profile and HIV risk among men on methadone: do social networks matter? *J Urban Health*. 2006;83:602–613.
- Howard DL, Latkin CA. A bridge over troubled waters: factors associated with non-injection drug users having injection drug-using sex partners. *J Acquir Immune Defic Syndr*. 2006;42:325–330.
- Neblett RC, Davey-Rothwell M, Chander G, et al. Social network characteristics and HIV sexual risk behavior among urban African American women. *J Urban Health*. 2011;88:54–65.
- Kottiri BJ, Friedman SR, Neaigus A, et al. Risk networks and racial/ethnic differences in the prevalence of HIV infection among injection drug users. *J Acquir Immune Defic Syndr*. 2002;30:95–104.
- Rhodes T, Singer M, Bourgois P, et al. The social structural production of HIV risk among injecting drug users. *Soc Sci Med*. 2005;61:1026–1044.
- Galea S, Ahern J, Karpati A. A model of underlying socioeconomic vulnerability in human populations: evidence from variability in population health and implications for public health. *Soc Sci Med*. 2005;60:2417–2430.
- Montgomery SB, Hyde J, De Rosa CJ, et al. Gender differences in HIV risk behaviors among young injectors and their social network members. *Am J Drug Alcohol Abuse*. 2002;28:453–475.
- Davey-Rothwell MA, Tobin K, Yang C, et al. Results of a randomized controlled trial of a peer mentor HIV/STI prevention intervention for women over an 18 month follow-up. *AIDS Behav*. 2011;15:1654–1663.
- Latkin CA, Sherman S, Knowlton A. HIV prevention among drug users: outcome of a network-oriented peer outreach intervention. *Health Psychol*. 2003;22:332–339.
- Tobin KE, Kuramoto SJ, Davey-Rothwell MA, et al. The STEP into action study: a peer-based, personal risk network-focused HIV prevention intervention with injection drug users in Baltimore, Maryland. *Addiction*. 2011;106:366–375.
- Campbell C, MacPhail C. Peer education, gender and the development of critical consciousness: participatory HIV prevention by South African youth. *Soc Sci Med*. 2002;55:331–345.
- Kelly JA, St Lawrence JS, Stevenson LY, et al. Community AIDS/HIV risk reduction: the effects of endorsements by popular people in three cities. *Am J Public Health*. 1992;82:1483–1489.
- Rothenberg RB, Potterat JJ, Woodhouse DE, et al. Social network dynamics and HIV transmission. *AIDS*. 1998;12:1529–1536.
- Umberson D, Crosnoe R, Rezek C. Social relationships and health behavior across life course. *Annu Rev Sociol*. 2010;36:139–157.
- Costenbader EC, Astone NM, Latkin CA. The dynamics of injection drug users' personal networks and HIV risk behaviors. *Addiction*. 2006;101:1003–1013.
- Latkin C, Mandell W, Vlahov D, et al. My place, your place, and no place: behavior settings as a risk factor for HIV-related injection practices of drug users in Baltimore, Maryland. *Am J Community Psychol*. 1994;22:415–430.
- Williams CT, Liu W, Levy JA. Crossing over: drug network characteristics and injection risk along the China-Myanmar border. *AIDS Behav*. 2011;15:1011–1016.
- Jones S, Fox S. Pew Internet project data memo. Pew Internet and American Life Project: A Project of the Pew Research Center Web site. Available at: <http://www.pewinternet.org/Reports/2009/Generations-Online-in-2009.aspx>. Updated January 28, 2009. Accessed September 1, 2011.
- Taylor P, Keeter S, eds. Millennials: a portrait of generation next: confident, connected, open to change. Pew Research Center: Numbers, Facts, and Trends Shaping Your World Web site. Available at: <http://pewsocialtrends.org/files/2010/10/millennials-confident-connected-open-to-change.pdf>. Updated 2011. Accessed September 1, 2011.
- Sullivan PS, Khosropour CM, Luisi N, et al. Bias in online recruitment and retention of racial and ethnic minority men who have sex with men. *J Med Internet Res*. 2011;13:e38.
- Chiaffon MA, Parsons JT, Tesoriero JM, et al. HIV behavioral research online. *J Urban Health*. 2006;83:73–85.
- Chiaffon MA, Hirshfield S, Rietmeijer C. HIV prevention and care in the digital age. *J Acquir Immune Defic Syndr*. 2010;55(suppl 2):S94–S97.
- Campsmith ML, Rhodes PH, Hall HI, et al. Undiagnosed HIV prevalence among adults and adolescents in the united states at the end of 2006. *J Acquir Immune Defic Syndr*. 2010;53:619–624.
- Petroll AE, DiFrancesco W, McAuliffe TL, et al. HIV testing rates, testing locations, and healthcare utilization among urban african-american men. *J Urban Health*. 2009;86:119–131.
- German D, Villanti A, Towe V, et al. Unrecognized HIV infection among injection drug users in Baltimore. Presented at: CDC National HIV Prevention Conference 2011.
- Marks G, Crepez N, Janssen RS. Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA. *AIDS*. 2006;20:1447–1450.
- Kimbrough LW, Fisher HE, Jones KT, et al. Accessing social networks with high rates of undiagnosed HIV infection: the social networks demonstration project. *Am J Public Health*. 2009;99:1093–1099.
- Lally MA, Montstream-Quas SA, Tanaka S, et al. A qualitative study among injection drug using women in Rhode Island: attitudes toward testing, treatment, and vaccination for hepatitis and HIV. *AIDS Patient Care STDS*. 2008;22:53–64.

37. Downing M, Knight K, Reiss TH, et al. Drug users talk about HIV testing: motivating and deterring factors. *AIDS Care*. 2001;13:561–577.
38. Fuqua V, Chen YH, Packer T, et al. Using social networks to reach black MSM for HIV testing and linkage to care. *AIDS Behav*. 2012;16:256–265.
39. Vargo S, Agronick G, O'Donnell L, et al. Using peer recruitment and OraSure to increase HIV testing. *Am J Public Health*. 2004;94:29–31.
40. Gardenier D, Andrews CM, Thomas DC, et al. Social support and adherence: differences among clients in an AIDS day health care program. *J Assoc Nurses AIDS Care*. 2010;21:75–85.
41. Johnson CJ, Heckman TG, Hansen NB, et al. Adherence to antiretroviral medication in older adults living with HIV/AIDS: a comparison of alternative models. *AIDS Care*. 2009;21:541–551.
42. Knowlton AR, Arnsten JH, Gourevitch MN, et al. Microsocial environmental influences on highly active antiretroviral therapy outcomes among active injection drug users: the role of informal caregiving and household factors. *J Acquir Immune Defic Syndr*. 2007;46(suppl 2):S110–S119.
43. Samet JH, Freedberg KA, Stein MD, et al. Trillion virion delay: time from testing positive for HIV to presentation for primary care. *Arch Intern Med*. 1998;158:734–740.
44. Knowlton AR, Hua W, Latkin C. Social support networks and medical service use among HIV-positive injection drug users: implications to intervention. *AIDS Care*. 2005;17:479–492.
45. Knowlton AR, Yang C, Bohnert A, et al. Main partner factors associated with worse adherence to HAART among women in Baltimore, Maryland: a preliminary study. *AIDS Care*. 2011;23:1102–1110.
46. Simoni JM, Huh D, Frick PA, et al. Peer support and pager messaging to promote antiretroviral modifying therapy in Seattle: a randomized controlled trial. *J Acquir Immune Defic Syndr*. 2009;52:465–473.
47. Deering KN, Shannon K, Sinclair H, et al. Piloting a peer-driven intervention model to increase access and adherence to antiretroviral therapy and HIV care among street-entrenched HIV-positive women in Vancouver. *AIDS Patient Care STDS*. 2009;23:603–609.
48. Simoni JM, Pantalone DW, Plummer MD, et al. A randomized controlled trial of a peer support intervention targeting antiretroviral medication adherence and depressive symptomatology in HIV-positive men and women. *Health Psychol*. 2007;26:488–495.
49. Lee SS, Tam DK, Tan Y, et al. An exploratory study on the social and genotypic clustering of HIV infection in men having sex with men. *AIDS*. 2009;23:1755–1764.
50. Ward H, Ison CA, Day SE, et al. A prospective social and molecular investigation of gonococcal transmission. *Lancet*. 2000;356:1812–1817.
51. Klovdahl AS. Urban social networks: some methodological problems and possibilities. In: Kochen M, ed. *The Small World*. Norwood, NJ: Ablex Publishing Corporation; 1989:176–210.
52. Yang C, Latkin C, Luan R, et al. Peer norms and consistent condom use with female sex workers among male clients in Sichuan province, China. *Soc Sci Med*. 2010;71:832–839.
53. Latkin C, Donnell D, Celentano DD, et al. Relationships between social norms, social network characteristics, and HIV risk behaviors in Thailand and the United States. *Health Psychol*. 2009;28:323–329.
54. Davey-Rothwell MA, Latkin CA. An examination of perceived norms and exchanging sex for money or drugs among women injectors in Baltimore, MD, USA. *Int J STD AIDS*. 2008;19:47–50.
55. Bar-Lev S. “We are here to give you emotional support”: performing emotions in an online HIV/AIDS support group. *Qual Health Res*. 2008;18:509–521.
56. Reeves PM. Coping in cyberspace: the impact of internet use on the ability of HIV-positive individuals to deal with their illness. *J Health Commun*. 2000;5(suppl):47–59.
57. NIMH Collaborative HIV/STD Prevention Trial Group. Results of the NIMH collaborative HIV/sexually transmitted disease prevention trial of a community popular opinion leader intervention. *J Acquir Immune Defic Syndr*. 2010;54:204–214.
58. Woodhouse DE, Potterat JJ, Rothenberg RB, et al. Ethical and legal issues in social network research: the real and the ideal. *NIDA Res Monogr*. 1995;151:131–143.