Intervening within and across levels: A multilevel approach to stigma and public health

Jonathan E. Cook [a],*, Valerie Purdie-Vaughns [b], Ilan H. Meyer [c], Justin T.A. Busch [d]

[a] Department of Psychology, The Pennsylvania State University, University Park, PA 16802, USA
[b] Department of Psychology, Columbia University, 1190 Amsterdam Ave MC 5501, New York, NY 10027, USA
[c] The Williams Institute, UCLA School of Law, Box 951476, Los Angeles, CA 90095-1476, USA
[d] Department of Psychology, The University of Texas at Austin, 108 E. Dean Keeton Stop A8000, Austin, TX 78712, USA

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ABSTRACT

This article uses a multilevel approach to review the literature on interventions with promise to reduce social stigma and its consequences for population health. Three levels of an ecological system are discussed. The intrapersonal level describes interventions directed at individuals, to either enhance coping strategies of people who belong to stigmatized groups or change attitudes and behaviors of the non-stigmatized. The interpersonal level describes interventions that target dyadic or small group interactions. The structural level describes interventions directed at the social-political environment, such as laws and policies. These intervention levels are related and they reciprocally affect one another. In this article we review the literature within each level. We suggest that interventions at any level have the potential to affect other levels of an ecological system through a process of mutually reinforcing reciprocal processes. We discuss research priorities, in particular longitudinal research that incorporates multiple outcomes across a system.

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Introduction

Many channels of social life have not simply a beginning and an end but are circular in character (Lewin, 1947, p. 147).

Stigma occurs when a *label* associated with a *negative stereotype* is attached to a characteristic (e.g., skin color, sexual orientation, chronic illness), causing people with this characteristic to be seen as *separate* from and *lower in status* than others and thus, as legitimate targets of *discrimination* (Link & Phelan, 2001). Stigma can affect the availability of societal resources (Link & Phelan, 2006), the way people interact with each other (Blascovich, Mendes, Hunter, & Lickel, 2000), and the way people think and feel (Crocker, Major, & Steele, 1998). It is fundamentally a multilevel construct and one that is increasingly seen as a contributor to health disparities (Hatzenbuehler, Phelan, & Link, 2013).

Our goal is to use a multilevel lens to understand interventions to reduce stigma, improve related health outcomes, and reduce health disparities. We review an interdisciplinary research literature that demonstrates the types of interventions that have been tested and where these interventions fit in a multilevel system. Our review includes interventions directed at several common stigmas and highlights ways that intervention approaches vary by stigma type. A multilevel approach suggests that health and healthcare are a part of a reciprocal web of relationships among individuals, their social networks, and larger social structures. This perspective encourages researchers to consider how effective interventions that target stigma at any level, when well-timed and congruent with conditions at other levels, might have long-term, cascading effects across a system.

Our review categorizes intervention types by their place in an ecological system (Bronfenbrenner, 1977) (see Fig. 1). We describe three levels—intrapersonal, interpersonal, and structural—consistent with others investigating health disparities (e.g., Jones, 2000). We use this model as a heuristic for the purpose of our analysis, recognizing that researchers have used a variety of models, differing in the number and types of system levels depicted (e.g., Belsky, 1980; Earnshaw, Bogart, Dovidio, & Williams, 2013; Johnson et al., 2010; McLeroy, Bibeau, Steckler, & Glanz, 1988).

At the innermost level (Fig. 1) are individuals and the *intrapersonal* dynamics that affect people's experiences with the environment. Interventions at this level are directed at both reducing stigma expression and reducing the impact of stigma on stigmatized

* Corresponding author. Fax: +1 814 865 9516.
 E-mail addresses: jonathan.emdin.cook@gmail.com, jecook@columbia.edu (J. E. Cook), vpvaughns@psych.columbia.edu (V. Purdie-Vaughns), meyer@law.ucla.edu (I.H. Meyer), justin.ta.busch@gmail.com (J.T.A. Busch).
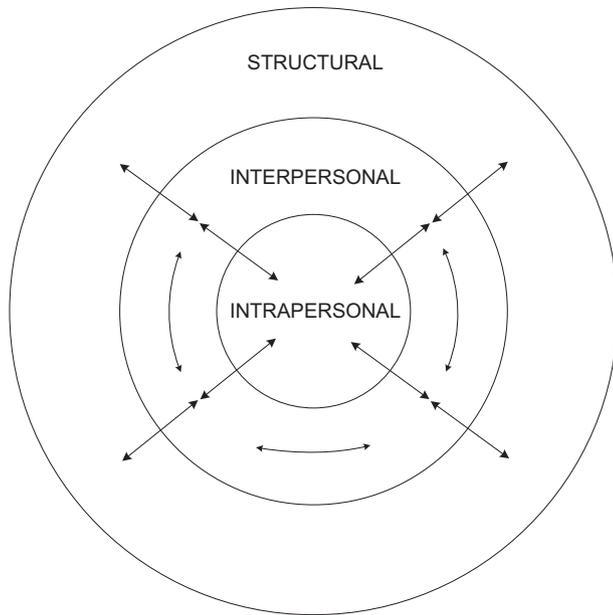
Fig. 1. A multilevel system with arrows depicting the possibility for bidirectional influences within and between system levels.

group members. Interventions at the *interpersonal* level target dyadic and small group interactions. These interventions may involve people who share a stigma or people who differ in their stigma status, including people who are not members of stigmatized groups. The outermost circle depicts the *structural* level, which focuses on social forces and institutions, like legislative action, mass media, and governmental or organizational policies. Interventions at the structural level target institutional forces that can affect material resources, legal practices, and psychological climate targeted at specific stigma groups. Central to our focus is the idea of bidirectional influences in an ecological system. Through a process of reciprocal causality, interventions can become self-reinforcing if improvement in one outcome improves others, which reinforces the original outcome in an ongoing feedback cycle. This process could unfold both within and between system levels.

We begin by providing an overview of our article selection and categorization process. We then describe the types of interventions we found at each level, separately identifying interventions that target stigmatized groups from those that target the non-stigmatized. We conclude by discussing how interventions might have effects across levels and providing recommendations for future research.

Methodological approach

A multilevel approach is by its nature multidisciplinary, ranging from biological and psychological research at the intrapersonal level to sociological and policy research at the outermost level. Accordingly, we review articles from a variety of disciplines, which have thus far existed mostly separate from one another in the stigma literature (Hatzenbuehler, 2009).

We define interventions as (a) manipulations designed to induce change that (b) have at least a theoretical possibility of a control group. This is consistent with Campbell's (1991) notion of an "experimenting society," in which researchers "try out new programs designed to cure specific social problems…[and] retain, imitate, modify or discard them on the basis of apparent effectiveness" (Campbell, 1969, p. 409). Our definition serves the goal for this article: to identify points in a system that may be effective places to deliberately induce change and test for effectiveness.

This article is not meant to be an exhaustive review of interventions, but rather a description of types of stigma interventions used and a discussion of where they fit in an ecological system. We do not critique research design, methodology, or outcomes and we remain agnostic about relative effectiveness.

Article selection and categorization

We searched several databases, including Web of Knowledge, Google Scholar, PubMed, and PsycINFO, using a variety of keywords, including stigma, intervention, health disparities, and stress. We also collected articles based on personal knowledge, recommendations from scholars who study stigma, and cited-reference searches. Our primary goal was to identify with reasonable confidence the *types* of interventions that have been attempted, not to do a systematic review of every intervention, which would be beyond the scope of this paper. Thus, the specific studies included here should be considered representative, not exhaustive.

We included interventions that targeted a variety of different outcomes. For example, given the link between stigma and health described in the current issue and elsewhere (e.g., Pascoe & Richman, 2009; Williams & Mohammed, 2009) interventions could focus on *directly reducing stigma* (e.g., changing public attitudes towards stigmatized groups). Interventions might also *enhance health behaviors*, either by promoting healthy behaviors (e.g., increasing medical checkups) or reducing unhealthy behaviors (e.g., unprotected sex) among members of stigmatized groups. Interventions could also *reduce psychosocial stress*, which is consistently associated with negative health outcomes (Cohen, Janicki-Deverts, & Miller, 2007; McEwen, 1998; Miller, Rohleder, & Cole, 2009) and may be a mechanism by which stigma leads to health disparities (Link & Phelan, 2006; Meyer, 2003; Sternthal, Slopen, & Williams, 2011). We also included interventions focused on *improving educational outcomes* for stigmatized groups, since higher levels of educational attainment are associated with better health (Case, Lubotsky, & Paxson, 2002; Pappas, Queen, Hadden, & Fisher, 1993; Rogers, Hummer, & Everett, 2013) and there are well-established educational disparities for many stigmatized groups (Jencks & Phillips, 1998; National Academy of Sciences, National Academy of Engineering, & Institute of Medicine, 2007). Finally, we included interventions aimed at *directly improving health outcomes* among stigmatized groups, whether physical or mental (e.g., increasing the availability of counseling resources).

We categorized articles first by their system level and then by intervention type within level. Level of intervention was defined with respect to the focus of the intervention and was irrespective of the intervention outcomes described above. Educational interventions designed to provide *individuals* with new knowledge about a topic, for example, were considered intrapersonal, even if such interventions were delivered in a group setting. However, interventions designed to affect the way larger institutions provide education were considered structural. Decisions about system level and intervention type were made collaboratively.

Below, we describe types of interventions within system levels, beginning at the intrapersonal and concluding with the structural. Within each level, we separately describe types of interventions aimed at members of stigmatized groups and those aimed at the non-stigmatized.

Results: intervention types

Intrapersonal-level interventions

Intrapersonal interventions target the way people think, feel, or behave. Because they are delivered individually, such interventions

are sometimes criticized as superficial because they do not change structural forces that give rise to stigma (e.g., Babalola, Fatusi, & Anyanti, 2009; Link, Mirotznik, & Cullen, 1991). However, intrapersonal approaches are important. They are often more easy to implement than structural interventions (e.g., Blankenship, Friedman, Dworkin, & Mantell, 2006; Hinshaw & Stier, 2008). Moreover, there is growing support for the idea that small changes, even those prompted by interventions at the individual level, can have enduring benefits, particularly when interventions are well-timed and supported by sufficient material resources (Johnson et al., 2010; Yeager & Walton, 2011).

We distinguish between two types of intrapersonal interventions: The first aims to alter physiological, cognitive, affective, and behavioral responses among the targets of stigma and thus help members of stigmatized groups *cope* with stigma. The second type uses interventions to reduce stigma toward a particular group, thus reducing the expression of stigma.

Intrapersonal interventions targeting members of stigmatized groups

Education and counseling

Educational and counseling interventions provide information and support that can help members of stigmatized groups make healthier decisions. For instance, part of an intervention at the Young Men's Clinic in New York City consisted of a group presentation in the clinic waiting room, an individual information session with a medical educator or social worker, and the integration of health information into the medical exam (Armstrong, Kalmuss, Franks, Hecker, & Bell, 2010). The intervention was geared towards a stigmatized group (low income Black and Latino men) and dealt with a stigmatized health issue (sexual and reproductive health). Three months later, participants reported a decrease in their number of sexual partners, an increase in their testicular self-exams, an increase in their condom use, and more knowledge about sexually transmitted infections and emergency contraception.

Education and counseling approaches to reduce the effects of stigma on people living with HIV/AIDS have been implemented in a variety of countries, often in combination with other intervention approaches. Positive outcomes have included reduced anxiety and distress after HIV testing, reduced feelings of isolation, and increased disclosure of HIV status (see Brown, Macintyre, & Trujillo, 2003; Sengupta, Banks, Jonas, Miles, & Smith, 2011 for reviews). In Zambia, an HIV testing and counseling intervention was associated with a decrease in stigmatizing attitudes six months later (Jürgensen, Sandøy, Michelo, & Fylkesnes, 2013).

Cognitive-behavioral therapy (CBT), which integrates educational, psychological, and behavioral approaches, has been used to help people cope with mental-illness stigma. CBT can reduce self-stigma and improve stress management, social functioning, and self-esteem for people with mental illness. Effects have been found across cultures (see Heijnders & Van Der Meij, 2006 for a brief review).

Expressive-writing

Disclosure of thoughts and feelings about traumatic experiences can improve mental and physical health (Frattaroli, 2006; Pennebaker, Colder, & Sharp, 1990). Because stigma can increase exposure to such experiences, expressive-writing interventions may provide stigmatized people with a coping strategy. They have particularly been used to help people cope with stress from potentially-concealable stigmas, like HIV or sexual minority status. For instance, Pachankis and Goldfried (2010) randomly assigned a sample of young gay men to write for 20 min per day for three days either about a neutral topic or a stressful stigma-related event they had experienced. Three months later, those who had written about a stressful event reported greater openness with their sexual orientation. Participants with low social support benefitted most from the intervention, reporting an increase in their number of gay friends and fewer psychological symptoms. Another study used an expressive-writing intervention to help HIV-infected patients cope with stigma from their illness (Petrie, Fontanilla, Thomas, Booth, & Pennebaker, 2004). Participants randomly assigned to an expressive writing condition had improved immune response (higher $CD4^+$ lymphocyte count) six months later.

Belonging

People have a strong, possibly evolutionarily-derived, motivation to belong (Kurzban & Leary, 2001) that has been called a core psychological need (Baumeister & Leary, 1995). For members of stigmatized groups, the potential for social exclusion can threaten this need. Social exclusion is painful (Eisenberger, Lieberman, & Williams, 2003) and associated with increased risk of mortality (Berkman & Syme, 1979). Interventions that increase people's sense of belonging may thus be an effective stigma-reduction strategy. As an example, Walton and Cohen (2007, 2011) provided incoming African American college students with evidence that uncertainty about belonging during the transition to college was normal and transitory. Participants wrote an essay and delivered a video-recorded speech explaining with examples from their own lives why people's experience in college would change over time. Relative to a control condition, African American students in the intervention condition felt more certain of their sense of belonging, and had better self-assessed health, fewer recent doctor visits, and a higher grade point average (GPA) throughout college. An important component of this intervention may have been timing. The intervention normalized African American students' concerns of being socially excluded early upon their arrival as minority group members at a college.

Values affirmation

Widespread negative stereotypes about the intellectual ability of African Americans and Latinos in the United States can cause both educational (Steele & Aronson, 1995) and healthcare (Burgess, Warren, Phelan, Dovidio, & van Ryn, 2010) settings to be stigmatizing for members of these groups. Values-affirmation interventions attempt to mitigate threat from stigma by reminding people of their valued identities, which helps restore a global sense of self-integrity (Sherman & Cohen, 2006; Steele, 1988). Because affirmation interventions work by mitigating the effects of identity threat (Purdie-Vaughns et al., 2009, September), they may be particularly useful in combination with educational or other intervention approaches that people may otherwise resist. This intervention has been successful at improving educational outcomes in several randomized trials. For instance, among African American middle-school students, those who completed a values-affirmation intervention in early 7th grade had a two-year GPA that was .24 points higher than those in the control condition (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009). Affirmation interventions may also directly improve health outcomes related to stigma. Cook and colleagues (Cook et al., 2013) found that Latino students' perceptions of stigma were associated with a greater likelihood of being clinically overweight two-years later. The intervention severed this association for affirmed Latino students, leading to a 35% drop in the likelihood of being overweight relative to the control condition.

Intrapersonal interventions targeting the non-stigmatized

Education

Educational interventions targeting people who are not stigmatized provide information to refute common stereotypes

associated with stigma and improve people's cultural competence. For instance, educational interventions may present information contradicting stereotypes of people with mental illness as dangerous and unpredictable (Morrison, Cocozza, & Vanderwyst, 1980). Or they might be used to help medical students incorporate cultural awareness into medical practice (Crandall, George, Marion, & Davis, 2003). Educational interventions directed at the non-stigmatized most frequently target stigma due to mental and physical illness and may be less effective at reducing other types of stigma (Corrigan & Kosyluk, 2013).

A meta-analysis suggests that educational approaches (combined across levels) can be effective at reducing mental-illness stigma. Corrigan, Morris, Michaels, Rafacz, and Rüsch (2012) analyzed data from 72 articles representing 14 countries in Europe, North and South America, Asia, and Australia. Results suggest that educational interventions had a medium-sized effect at reducing stigma ($d = .29$), with most studies focused on changing attitudes. Among a subset of more rigorous randomized controlled designs, the average effect was smaller ($d = .15$), but still significant.

Recent reviews also suggest that educational interventions—often in combination with other approaches—can reduce stigma toward people living with HIV/AIDS. Success has been reported in studies conducted in a variety of countries. Despite their apparent effectiveness, however, few studies test long-term impacts and the quality of most has been rated as poor, particularly those conducted in developing countries (Brown et al., 2003; Sengupta et al., 2011).

Cognitive dissonance

One recent study used the social-psychological theory of cognitive dissonance (Festinger, 1957) as a basis for developing an intervention to reduce stigma toward obesity. American students who were informed that their egalitarian values were inconsistent with negative views about obesity reported more positive attitudes toward the physical and romantic attractiveness of obese people than those in a control condition (Ciao & Latner, 2011).

Interpersonal-level interventions

Interpersonal interventions attempt to reduce stigma by harnessing the power of social situations. They can target interactions between the stigmatized and the non-stigmatized, which are often characterized by discomfort (Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001; Cook, Calcagno, Arrow, & Malle, 2012; Shelton & Richeson, 2006) and distrust (Cohen & Steele, 2002; Dovidio et al., 2008) or they can target small groups that share one or more stigmatized identities.

Interpersonal interventions targeting members of stigmatized groups

Information-processing

This category includes interventions that use dyadic or small group interactions to purposefully process information in order to reduce the effects of stigma. For example, a cognitive-behavioral treatment group for adults with schizophrenia focused on coping with mental-illness stigma (Knight, Wykes, & Hayward, 2006). The intervention used interactive exchanges between group members and therapists to discuss effective coping strategies and provide support. Post-intervention follow-up showed an increase in participants' self-esteem and a decrease in depression and other psychopathology. Similar results have been reported in studies using therapy groups to help people cope with mental-illness stigma (McCay et al., 2006; Roe, Hasson-Ohayon, Derhi, Yanos, & Lysaker, 2010). Support groups can also help family members of people with

mental illness (e.g., Perlick et al., 2011) and HIV/AIDS (Smith Fawzi et al., 2012; see also Heijnders & Van Der Meij, 2006) cope with their "courtesy stigma" (Goffman, 1963).

Oyserman, Bybee, and Terry (2006) proposed that stigma may lead racial minority and low-income students to feel that sustained effort in school is inconsistent with their social identities. A randomly-assigned "school-to-jobs" intervention involved ongoing structured interactions among middle-school students from stigmatized groups (African American, Latino, and low-income Whites). Intervention students were encouraged to develop visions for their future and strategies for overcoming obstacles. Students in the intervention condition had fewer absences, higher GPA, and reduced depression a year later.

Community-based rehabilitation

Community-based rehabilitation (CBR) is a strategy to empower members of stigmatized groups by better integrating them into communities. For example, a program in India provided vouchers for people with physical challenges to travel with a companion for treatment or other needs. As a result, members of this stigmatized group became empowered as providers of travel vouchers, which were highly valued (Dalal, 2006). Another CBR program in India has been credited with improving the occupational status of people with leprosy and the attitudes of their family members (see Heijnders & Van Der Meij, 2006).

Interpersonal interventions targeting members of non-stigmatized groups

Information-processing

One study, at the intersection of psychology and education, tested whether dominant-group educators could interact with racial-minority students in a way that promotes trust. African American students wrote an essay that was critiqued by White instructors. The critique was critical (e.g., "needs work in several areas") but in a "wise" condition, invoked high standards and reassurance (e.g., "The comments I provide…are quite critical but…I wouldn't go to the trouble…if I didn't think…that you are capable") (Cohen, Steele, & Ross, 1999, p. 1306–1307). African American students who received wise feedback worked harder and wrote higher-quality essays than those in the critical feedback condition (Cohen et al., 1999; Yeager et al., 2013) and had more trust in school and better academic performance in the semester after the intervention (Yeager et al., 2013). This suggests that their interactions with teachers played a causal role.

Intergroup contact

Members of stigmatized groups are typically numerical minorities in society and thus likely to have a lot of outgroup contact (e.g., Cook, Arrow, & Malle, 2011). Non-stigmatized people often have less contact with stigmatized minority groups, especially meaningful, high quality contact. Contact interventions encourage people to "connect with the person" who is stigmatized (Shera, 1996, p. 162) and are often used to combat stigma from HIV/AIDS and mental illness. In a recent meta-analysis, intergroup contact, particularly when delivered in-person rather than through video, was found to improve attitudes and behavioral intentions toward people with mental illness (Corrigan et al., 2012). For example, a large-scale stigma reduction program (*Time to Change*) showed that high-quality contact with people who had mental illness was associated with increased positive behavioral intentions (e.g., reporting a lower likelihood of avoiding people with mental illness) (Evans-Lacko et al., 2012; Henderson & Thornicroft, 2009). Contact may be most effective at reducing stigma when it follows an educational intervention (Chan, Mak, & Law, 2009) and when it is

part of a structured intervention rather than naturalistic (Eisenberg, Downs, & Golberstein, 2012). But intergroup contact has been ineffective at reducing weight stigma, perhaps partly because of perceptions of controllability associated with weight (see Ciao & Latner, 2011).

Even if levels of prejudice are low, intergroup interactions can be threatening and counterproductive for both parties in an interaction because they create anxiety and uncertainty (Vorauer, 2006). Research suggests that friendship with outgroup members can be effective at reducing anxiety with new outgroup acquaintances (Page-Gould, Mendoza-Denton, & Tropp, 2008). Even indirect friendship—i.e., knowledge of ingroup members' friendship with outgroup members—may be sufficient to reduce anxiety during outgroup interactions (Paolini, Hewstone, Cairns, & Voci, 2004). This suggests intervention possibilities. For instance, medical school students could be encouraged to foster intergroup friendships or reflect on their friends and families' intergroup friendships as a way of reducing anxiety during interactions with patients from stigmatized groups.

Structural-level interventions

Interventions at the structural level are meant to change social conditions that give rise to stigma. At a societal level, these are interventions designed to alter cultural institutions and reduce barriers to education, healthcare, and housing. At an institutional level, these are interventions that signal respect for diversity and a commitment to institutional fairness. A strength of structural-level interventions is their potential to impact large numbers of people.

Structural interventions targeting members of stigmatized groups

Communicating diversity values
Environmental cues can trigger identity threat, which undermines performance and health (Steele, Spencer, & Aronson, 2002) and deters people from pursuing education or employment in stereotype-relevant domains (Cheryan, Plaut, Davies, & Steele, 2009). Interventions that communicate diversity values aim to change environmental cues. They target members of stigmatized groups with the goal of signaling inclusivity. In one laboratory experiment, African American participants were exposed to an ostensible company brochure. When the company was presented as having low minority representation, participants viewed the company as low in trust, unless the company explicitly stated that diversity was an important institutional value (Purdie-Vaughns, Steele, Davies, Ditlmann, & Crosby, 2008). Outside the lab, a clinic for ethnic minority patients in New York displayed photographs of successful men of color, paintings of men hugging their children, and other positive images to communicate that men are respected and welcomed (Armstrong et al., 2010). Diversity values can also be communicated by influential leaders, such as when Nelson Mandela, the former South African president, decided in 2005 to "give publicity to HIV/AIDS and not hide it" by announcing that his son had died from AIDS (Wines, 2005, January 6).

Legal/policy interventions
Legal/policy interventions use legislative approaches to protect and normalize stigmatized groups. For example, in the United States, the Civil Rights Act of July 1964 barred discrimination by race, color, religion, and national origin in voter registration and service at public facilities. In 1966, hospitals were required to eliminate racially discriminatory practices in order to receive Medicare payments. Recent analyses argue that a sharp drop in the mortality rate of African Americans in the 1960s and 1970s—particularly in southern states where segregation and discrimination were high—can be causally linked to this legislation (Almond, Chay, & Greenstone, 2006; Krieger et al., 2008; see also Williams, 2012). Title IX of the Educational Amendments Act of 1972 barred discrimination in academic programs, with a recent extension specifically protecting sexual minority students (United States Department of Education Office for Civil Rights, 2010). A review of federal housing policy in the United States indicates that tenant-based housing programs, which provide rental vouchers to low-income families, can decrease families' depression and anxiety and improve their self-rated health (Anderson et al., 2003).

Laws that protect lesbians, gay men, and bisexuals, including laws that avail civil marriage to same-sex couples, provide additional evidence for the value of legislative interventions. For example, a longitudinal analysis investigated medical visits in Massachusetts among male, sexual minority patients. Results revealed that after same-sex marriage was legalized, the number of medical and mental-health care visits decreased (Hatzenbuehler et al., 2012).

Outside the U.S., recent laws to protect people with physical challenges have been initiated in India, South Korea, and Australia (Dalal, 2006). In Botswana, a government initiative to provide universal access to antiretroviral therapy was associated with less fear about negative social consequences of having HIV or disclosing HIV status (Wolfe et al., 2008). In Senegal, government support for efforts to reduce HIV/AIDS prompted the establishment of national AIDS programs that have fostered a climate of de-stigmatization and increased condom use (Diop, 2000). Many countries throughout the world have established hate speech laws, which may be effective at reducing discrimination against stigmatized groups (Hernandez, 2011).

Structural interventions targeting members of non-stigmatized groups

Advertising, mass media, and educational interventions
Advertising and mass media interventions attempt to change public opinion on a large scale. They have been used to address stigma due to homophobia (Hull, Gasiorowicz, Hollander, & Short, 2013), HIV/AIDS (Babalola et al., 2009), and mental illness. For instance, Scotland's "see me" campaign monitored and corrected misleading portrayals of mental illness and used a media campaign to personalize and normalize mental illness. Two years after the campaign began surveys showed an 11% drop in people agreeing that the public should be better protected from people with mental health problems and a drop from 32% to 15% in those who believed that people with mental health problems are often dangerous (Dunion & Gordon, 2005, March). Similar results have been found with other campaigns to reduce mental-illness stigma (e.g., Henderson & Thornicroft, 2009). A program in New Zealand found that people with mental illness perceived less stigma among the general public after a social marketing campaign (Vaughan & Hansen, 2004).

Educational approaches at the structural level may involve changes in curricula. For example, California's 2011 FAIR Education Act adds LGBT people to a list of minority groups whose contribution to society must be included in educational programs. Similarly, both New Jersey and California now require cultural competence training for physicians (Landers, 2009, October) and American accreditation organizations require that medical schools incorporate cultural competence training (Smedley, Stith, & Nelson, 2003). Education can also be disseminated by the media, such as public service announcements designed to reduce mental-illness stigma (Corrigan & Kosyluk, 2013).

Discussion: stigma interventions and dynamic systems

Our review found evidence of effective interventions aimed at reducing stigma and its health consequences across multiple levels of an ecological system. Type of intervention varied somewhat by stigma type. For example, interventions to reduce mental-illness stigma or stigma toward people with HIV mostly used educational and contact approaches directed at the non-stigmatized. Structural interventions and intrapersonal interventions to help members of stigmatized groups cope with stigma were more equally distributed across stigma types. In general, intervention research was fairly limited in duration and in the number of outcomes assessed. In addition, we found few research projects that conceptualized outcomes at different system levels.

Stigma researchers increasingly recognize the value of multilevel, ecological approaches, but they have largely overlooked the idea that ecological systems are dynamic and characterized by bidirectional influences within and between levels (Bronfenbrenner, 1977; see also Schensul, 2009). Understanding when, how, and why stigma-related interventions are successful requires research that tracks effects at different levels using multiple dependent variables over time.

The idea that interventions to reduce stigma at the structural level can affect interpersonal and intrapersonal outcomes is straightforward. Indeed, it is the purpose and an expected outcome of structural interventions that they would have global and wide-ranging effects on everyday life (Blankenship et al., 2006). Less obvious is the idea that interventions at lower levels can have wide-ranging multilevel impact. This potential is posited by ecological models, but rarely discussed or tested.

Indeed, it is commonly assumed, with little evidence to support this, that intrapersonal interventions are ineffective in the presence of unfavorable structural conditions. However, at least in democratic societies, social structures themselves are, in part, a reflection of the individual members of society. For instance, research on same-sex marriage in the United States suggests public opinion affects legislation more than the reverse (Lewis & Oh, 2008). As American society has adopted more positive attitudes toward homosexuality (Baunach, 2012), laws allowing same-sex marriage have followed. This suggests that lower-level interventions may sometimes be effective at changing inhospitable social structures (Aboud, Huq, Larson, & Ottisova, 2010).

The potential for intrapersonal interventions to trigger cross-level effects is consistent with the increasing recognition that members of stigmatized groups are not passive recipients of negative social perspectives, but actively work to change their environments (Heijnders & Van Der Meij, 2006; Schmader, Croft, Whitehead, & Stone, 2013; UNAIDS, 2007). For people with concealable stigmas, disclosure can be one such active strategy (Herek & Capitanio, 1996; Siegel, Lune, & Meyer, 1998). Intrapersonal interventions that increase disclosure (see Brown et al., 2003) may be effective at improving interpersonal interactions and thus changing attitudes of the non-stigmatized (Davies, Tropp, Aron, Pettigrew, & Wright, 2011). This example demonstrates how intrapersonal effects can transfer to the interpersonal level and back again and theoretically affect structural changes that over time reduce the effect of stigma on health. However, we do not mean to suggest that disclosure has uniformly positive effects, a point underscored by differences between ethnic majority and ethnic minority individuals in the disclosure process related to sexual orientation (Seidman, 2002).

In Fig. 2 we depict hypothetical interchanges among interventions using a multilevel, ecological model. The model suggests that interventions beginning at any level could have effects that cascade across levels and reduce stigma and its effects on health. For illustrative purposes, we describe an example beginning at the intrapersonal level, but interventions could also start from the interpersonal or structural levels, as shown in the figure. Beginning from the bottom left of Fig. 2, a values-affirmation intervention might be delivered to patients from a stigmatized group upon intake at a medical clinic. Previous research suggests that this intervention can provide a psychological resource (Schmeichel & Vohs, 2009) that helps people cope with negative stereotypes (Sherman & Cohen, 2006). As a result, affirmations may help reduce defensive processing of threatening health information (Armitage, Harris, Hepton, & Napper, 2008), increase self-efficacy (Epton & Harris, 2008), and foster a greater sense of belonging (Cook, Purdie-Vaughns, Garcia, & Cohen, 2012). This could improve interpersonal interactions with physicians (Havranek et al., 2012). Positive interactions with physicians may then motivate greater adherence to treatment plans and increase the likelihood of treatment seeking. For healthcare workers, positive intergroup interactions with patients might alter their perceptions of stigmatized groups. Over time and with repetition, effects may reach the structural level. For example, members of stigmatized groups may come to see the healthcare system as more inclusive and less threatening. Young members of such groups may be more likely to consider a career in medicine. Healthcare workers may come to advocate for stigmatized groups (e.g., lobbying for increased funding for healthcare needs related to certain groups) and become more favorably inclined to hire people from such groups, so that the healthcare system becomes more diverse. These latter effects, at least as applied to this example, would require additional research to verify.

A limited body of research exists beyond the studies previously described to test the ideas presented in Fig. 2. For example, at the structural level, Diop (2000) found that governmental policies in Senegal produced a number of structural interventions that reduced stigma at lower system levels. Similarly, Mall and colleagues (Mall, Middelkoop, Mark, Wood, & Bekker, 2013) found that providing education and access to antiretroviral therapies at the structural level reduced stigma at the intrapersonal level and increased HIV testing. An interpersonal intervention in Nepal led people with leprosy to become advocates who ultimately initiated a variety of changes at the structural (village) level (Cross, 2006). At the intrapersonal level, Cohen and colleagues (Cohen et al., 2009) found that affirmed African American students were less likely to be assigned to remedial education, suggesting an upwardly cascading effect (i.e., a change in the racial composition of high-performing students). Despite these examples, research investigating ongoing reciprocal effects related to stigma and health is limited and an important area for future research. Such research will require longitudinal approaches with longer time frames than those typically used and statistical analyses that can simultaneously model different system levels (e.g., multilevel modeling).

Interventions that incorporate a longitudinal, multilevel focus will increase consideration of system features that may facilitate or impede effectiveness (see Arrow & Cook, 2007) and help reveal potential unintended consequences. For example, Meyer and Bayer (2013) discuss how structural interventions to reduce homophobia may meet resistance in areas where the majority of individuals endorse religious attitudes that reject homosexuality as sinful. Research by Angermeyer, Matschinger, Link, and Schomerus (submitted for publication) suggests that in some cases interventions at one level may even thwart changes at another level. Within the "system" of an individual lifespan, interventions delivered at sensitive transitional periods may be more likely to yield long-term effects (Cook et al., (2012)). Unintended consequences may also be missed without assessing multiple outcomes and following participants over substantial periods of time. For

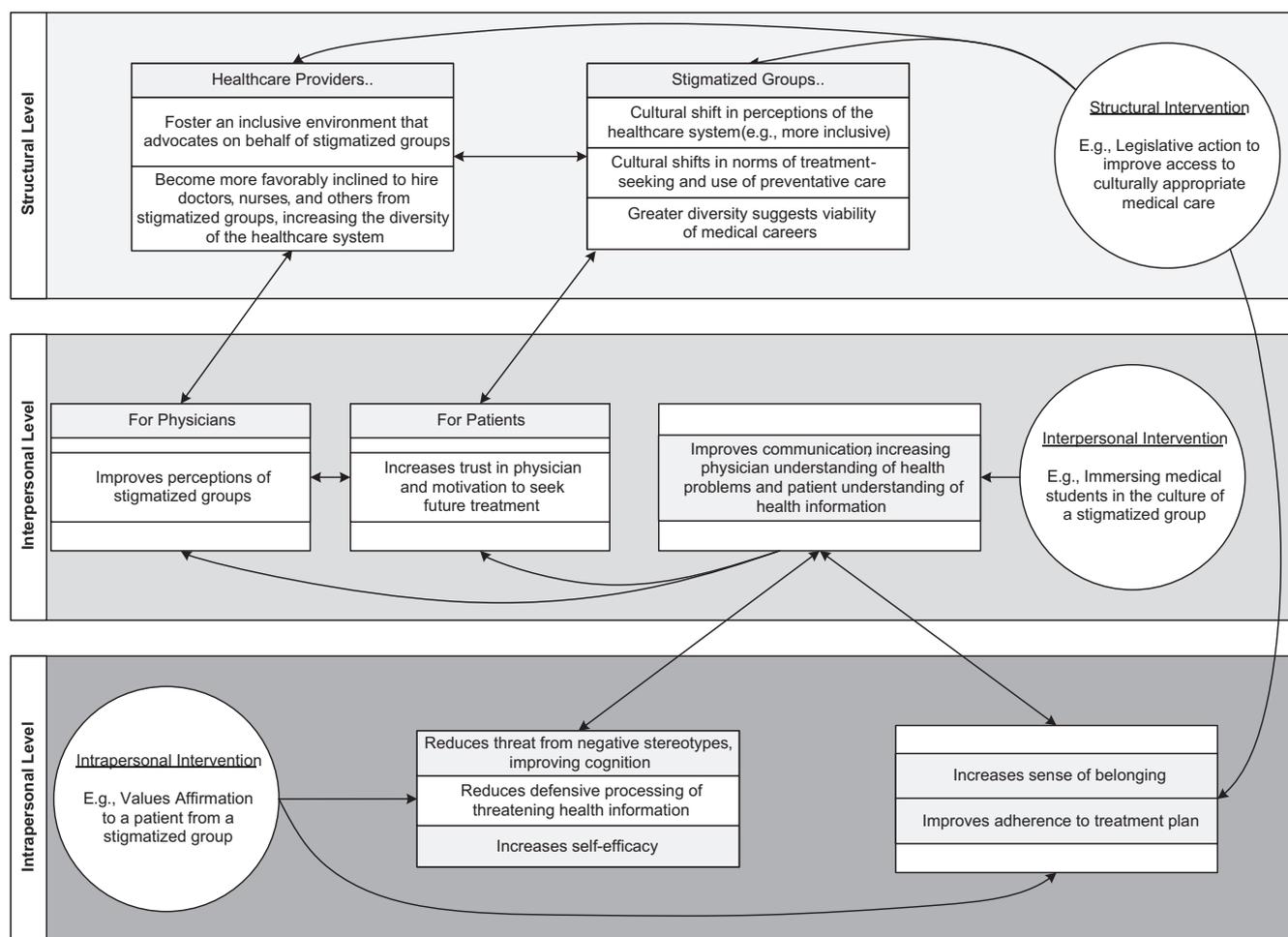A MULTILEVEL APPROACH TO STIGMA AND PUBLIC HEALTH

Fig. 2. A hypothetical illustration of multilevel intervention effects.

example, recipients of federal housing assistance who were placed in new neighborhoods reported an increase in neighborhood safety and housing quality, but their use of medical preventive services declined over time. Being in a more affluent neighborhood may have had the unintended consequence of increasing barriers to healthcare (Anderson et al., 2003).

A multilevel perspective also encourages researchers to consider measurement of stigma outcomes more broadly. In some content areas, researchers have relied heavily on self-report measures of stigma, but it is unclear how much these measures correlate with health outcomes (Earnshaw & Chaudoir, 2009). It is important to consider other outcomes that would signify reduction in stigma. These might include behavioral measures, assessment of diversity in a given context, and assessment of intergroup disparities in educational and health. Both positive and negative (unintended) consequences of interventions should be assessed using multiple outcomes and studying the effect longitudinally.

Conclusion

Health disparities between stigmatized and non-stigmatized groups remain after accounting for individual-level risk factors (Hatzenbuehler, Wieringa, & Keyes, 2011), suggesting the importance of structural-level interventions. But disparities also remain after accounting for a variety of structural factors (Major, Mendes, &

Dovidio, 2013; Smedley et al., 2003), suggesting the importance of intrapersonal and interpersonal interventions. In this paper we illustrated a sample of interventions aimed at reducing the effects of stigma across system levels. The target of the interventions we reviewed varied by researcher discipline without much integration between psychology, sociology, public health, and other areas. In many areas of stigma research, interventions focusing on members of stigmatized groups have almost exclusively emphasized education and counseling. Advances in social psychology research on interventions that target motivational systems (e.g., belonging, values affirmation, identity), offer a fruitful direction for future research that should be tested more broadly. As researchers and practitioners continue to develop and test stigma-related interventions, a greater emphasis on interdisciplinary collaboration is important for developing coordinated interventions that target outcomes at different levels.

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