

## Common Factors in Effective HIV Prevention Programs

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**Abstract** We propose a set of common factors in evidence-based interventions (EBI) for HIV prevention, which cut across theoretical models of behavior change. Three existing literatures support this agenda: (1) Common factors in psychotherapy; (2) core elements from the Centers for Disease Control and Prevention EBIs; and (3) component analyses of EBI. To stimulate discussion among prevention researchers, we propose a set of common factors at the highest level of abstraction that describe what all effective programs do: (1) establish a framework to understand behavior change; (2) convey issue-specific and population-specific information necessary for healthy actions; (3) build cognitive, affective, and behavioral self-management skills; (4) address environmental barriers to implementing health behaviors; and (5) provide tools to develop ongoing social and community support for healthy actions. A focus on common factors will enhance research on new HIV prevention interventions, encourage collaboration among

researchers, provide guidelines for adapting EBI, and simplify and speed the adoption of EBI for providers.

**Keywords** Common factors · Core elements · Effective HIV prevention programs · HIV prevention interventions · Evidence-based interventions

Since 1990, the number of evidence-based HIV prevention programs targeting at-risk or HIV-infected populations has increased dramatically. At least 144 interventions qualify as evidence-based interventions (EBI), reflecting that their efficacy has been demonstrated through a randomized controlled trial (Lyles et al. 2007; National Institutes of Health 2000). Given the steady growth in the estimated numbers of persons living with HIV/AIDS, and the absence of an effective vaccine, it is increasingly important to promote and disseminate effective EBI for preventing the spread of HIV (Lyles et al. 2007). In the United States, the federal Centers for Disease Control and Prevention (CDC) and state governments have supported the adoption of these EBI through such programs as the Prevention Research Synthesis (PRS), Replicating Effective Programs (REP), and Disseminating Evidence-based Interventions (DEBI) programs (Centers for Disease Control and Prevention 2001; Collins et al. 2006).

Even when encouraged by administrative policies and funding bodies, community-based organizations and health providers face multiple challenges in implementing and adapting interventions with fidelity (Collins et al. 2006; Dworkin et al. 2008; Rotheram-Borus et al. 2004; Jensen 2003). Thus, EBI for HIV have not been widely scaled and utilized (Eke et al. 2006; Green 2006). While HIV prevention scale-up efforts may prove to be successful over

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the long run, new challenges and evolving dynamics in the epidemic will require continuous development and adaptation of interventions to new contexts. The focus of the CDC has been to expand capacity of local agencies and health care settings to replicate specific EBIs with fidelity, spearheaded by REP and DEBI programs. Rather than promote replication with fidelity to specific EBI activities, we argue that there is a set of common factors that are, or should be, consistently implemented in every EBI. Providers and researchers will be well served if these factors are identified and if replication, adaptation, and development of new interventions consistently include the common factors underlying the efficacy of all EBIs.

### Common Outcomes from Common Origins

There has been a shared set of successful preventive behavioral outcomes that cuts across specific EBI in HIV prevention. In their recent review, Lyles et al. (2007) identify 18 new EBI which show statistically significant intervention effects for at least one relevant outcome measure, at least 3 months post-intervention, with a minimum retention rate of 70%. These interventions are based on at least one of several different models or theories of behavior change, which are expected to guide selection and design of effective change strategies, and are often thought of as competing orientations: seven EBIs use Social Cognitive Theory, four use Social Learning Theory, three use the AIDS Risk Reduction Model, three use the Information-Motivation-Behavior Model, and three use the Theory of Gender and Power. Even though five different theoretical labels are invoked, these theories have substantial overlap (Fishbein et al. 2001). Furthermore, the different theories and strategies lead to outcomes that are remarkably similar across EBIs: 44% increase condom use, 67% reduce unprotected sex, 22% report reductions in new sexually transmitted diseases (STD), and 3 report reduced injection drug use.

The common outcomes in preventive behaviors from EBI based on different theoretical models can be explained in three alternative ways<sup>1</sup>: (1) different models can achieve similar outcomes through different processes; (2) different outcomes also are occurring, but have not been detected or reported; and (3) different models embody *common factors* that encourage preventive behavior, but are not necessarily emphasized by the model of behavior change used by a given intervention. None of these three explanations can be dismissed. The CDC's DEBI and REP programs act under the first explanation, with a focus on how to replicate

specific EBIs with fidelity, allowing for some latitude in adaptation to specific contexts. Replication with fidelity refers to activity sequences that must be replicated from the original program. The second explanation also cannot be dismissed; most EBI studies report on the primary HIV preventive behaviors, but some also report other secondary outcomes (e.g., quality of life; Rotheram-Borus et al. 2001).

The third explanation is the focus of this paper. Identifying common factors that cut across EBI does not exclude the possibility that theories or specific intervention designs do not enhance additional protective factors, but we see great potential benefit to the field by a focus on common factors. A focus on common factors assists both researchers and providers who wish to use EBI. First, it moves the focus away from particular theoretical models of behavior change and EBI activity sequences toward a focus on effective practices. The set of common factors is a list of what the activity sequences intend to achieve. Second, it aims to engender a spirit of collaboration among intervention researchers, if the field can work to understand what their EBI share, rather than how their models differ. We attempt to build coherence and consensus across EBI. Third, if the field can successfully identify the common factors that underlie successful EBI, adaptation of EBI will become far easier for practitioners, and new interventions can be developed faster as the pandemic continues to change.

### Existing Literatures Supporting Common Factors

Three existing literatures support the agenda to identify common factors for HIV prevention: (1) common factors in psychotherapy; (2) core elements in HIV prevention EBI; and (3) component analyses of HIV prevention and prevention programs for other risk patterns.

#### Common Factors in Psychotherapy

For decades, psychotherapy researchers have worked to explain common outcomes observed from diverse therapeutic models by proposing that common factors underlie the diverse models (e.g., Frank 1961; Rosenzweig 1936). Numerous meta-analyses of evidence-based therapies confirm that all psychotherapy models are about equally effective, when the therapies are theoretically based and have a protocol (Messer and Wampold 2002). Researchers and practitioners have worked to identify consistent sets of common factors that are responsible for these common outcomes (see Lambert and Bergin 1994; Bickman 2005). This work has resulted in a greater understanding about what factors are necessary and perhaps even sufficient to improve mental health. These insights have enabled

<sup>1</sup> Lambert and Bergin (1994) use an analogous set of arguments to explain the importance of common factors in psychotherapy.

researchers to generate increasingly effective new treatments that are simpler for the practicing clinician to adopt and implement (e.g. Patterson 1984; Garfield 1991; Chorpita et al. 2007).

As an example, one recent conceptualization of common factors is proposed to encompass a variety of “change-inducing” relationships. In addition to psychotherapy, relationships in educational settings, coaching, parenting, and even politics have similar processes (Lampropoulos 2001): (1) stating the need or defining the problem; (2) a relationship with a change agent; (3) receipt of empathy and support; (4) positive expectations for program or relationship; (5) contract for an alliance; (6) provision of a rationale for participating in the change program; (7) a process of confrontation and learning; and (8) mastery of new skills. Our goal is to stimulate an analogous program of research in HIV prevention, so that there is less replication of interventions at the level of activity sequences and greater attention to what is common across EBI.

### Core Elements in EBIs for HIV Prevention

Common factors for HIV prevention are not to be confused with EBI “core elements” that emerged from the CDC’s REP and DEBI programs. Core elements are defined as “the features in the intent and design of an intervention that are responsible for the effectiveness of the intervention” (Kegeles et al. 2000, p. 90), which include the required components that embody the theory and internal logic of the intervention and are most likely to produce the intervention’s main effects (Eke et al. 2006; McKleroy et al. 2006). The broad intents of common factors and core elements are similar, to specify the causal mechanisms in an intervention that support behavior change. However, the specific purposes are different. Core elements are intended to inform replication and adaptation of a *specific* EBI with fidelity to the original intervention, specifically as guidelines for providers regarding non-adaptable *core elements* and adaptable *key characteristics* (Kelly et al. 2000; Collins et al. 2006). Common factors are intended to represent the elements responsible for effectiveness across all EBI, which would provide a common standard for adaptation of EBI with fidelity, rather than specific standards for each EBI.

Core elements vary dramatically in scope and specificity of the constructs described across EBI. In contrast, common factors aim to be consistent across EBI. Table 1 shows core elements from five EBIs featured in Kelly et al.’s (2000) original report on adapting EBIs with fidelity to core elements. This list demonstrates that core elements may (or may not) incorporate key skills, specific activities, target population characteristics, and/or recruitment and outreach strategies. Core elements most typically describe

what a provider is supposed to do, although the specificity of instructions also is quite variable (see Community Popular Opinion Leader and Mpowerment in Table 1). Other core elements embody intermediate outcomes that intervention participants should achieve to support behavior change (see Street Smart in Table 1). All EBIs also include core elements that suggest the importance of building skills and social support, yet the specificity and explicitness of these factors are quite variable across EBI core elements.

There is no consensus on the level at which to define the causal mechanisms implied in core elements. There is not typically data on the EBI to provide evidence that the core elements are indeed the causal mechanisms necessary for behavior change or for program success. Recommendations have been made to identify core elements through research and program evaluations (McKleroy et al. 2006), including rigorous designs such as components analysis (Kelly et al. 2008). However, the default approach is for core elements to be defined by the EBI researcher-developers, occasionally with input from providers or participants (McKleroy et al. 2006). In reviewing core elements across EBI, it seems that core elements may be defined, in part, vis-à-vis other EBIs to highlight what makes the EBI unique (i.e., *specific* factors), rather than what is common.

For example, at the broadest level core elements in community-level interventions (e.g., Community Popular Opinion Leader and Mpowerment programs), in contrast to individually-targeted interventions (e.g., Street Smart), emphasize processes for identifying and engaging community members and shifting social norms. Street Smart, a small-group program for at-risk adolescents, also works to identify and engage “communities” (or networks) of adolescents and shift social norms via the small-group sessions, but this is not emphasized in Street Smart’s core elements. Regardless, the same underlying intra-personal and inter-personal processes for behavior change must occur among individuals targeted by both community-level and individual-level interventions. For example, condom availability and norms, utilization and negotiation skills, and the personal motivation and environmental support to adopt and maintain the behaviors are included in each of the community-level interventions. Common factors for HIV prevention should reflect these common underlying change processes, regardless of the specific activities used to implement the program that are applicable for specific populations.

### Component Analyses

Several other approaches attempt to identify intervention characteristics that support efficacy across EBIs, all falling

**Table 1** Core elements in five evidence-based interventions for HIV prevention from the centers for disease control and prevention's dissemination of evidence-based interventions program

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<p>Video opportunities for innovative condom education (voices/voices); O'Donnell et al. 1998</p> <ul style="list-style-type: none"> <li>Viewing culturally-specific videos portraying condom negotiation</li> <li>Conducting small group skill-building sessions to work on overcoming barriers to condom use</li> <li>Educating program participants about different types of condoms and their features</li> <li>Distributing samples of condoms identified by participants as best meeting their needs</li> </ul> <p>Street Smart; Rotheram-Borus et al. 1991</p> <ul style="list-style-type: none"> <li>Enhancing affective and cognitive awareness, expression, and control</li> <li>Teaching HIV/AIDS risk hierarchy and its personal application</li> <li>Identifying personal triggers, using peer support and small group skills-building sessions</li> <li>Building participant's skills in problem solving, personal assertiveness, and HIV/AIDS harm reduction</li> </ul> <p>Popular Opinion Leader (POL); Kelly et al. 1997</p> <ul style="list-style-type: none"> <li>Intervention is directed to an identifiable target population in well-defined community venues and where the population's size can be estimated</li> <li>Ethnographic techniques are systematically used to identify segments of the target population and to identify those persons who are most popular, well-liked, and trusted by others in each population segment</li> <li>Over the life of the program, 15% of the target population size found in intervention venues are trained as POLs</li> <li>The program teaches POLs skills for initiating HIV risk reduction messages to friends and acquaintances</li> <li>The training program teaches POLs characteristics of effective behavior change communication messages targeting risk-related attitudes, norms, intentions, and self-efficacy. In conversations, POLs personally endorse the benefits of safer behavior and recommend practical steps needed to implement change</li> <li>Groups of POLs meeting together weekly in sessions that use instruction, facilitator modeling, and extensive role play exercises to help POLs refine their skills and gain confidence in delivering effective HIV prevention messages to others. Groups are small enough to provide extensive practice opportunities for all POLs to shape their communication skills and create comfort in delivering conversational messages</li> <li>POL's set goals to engage in risk reduction conversations with friends and acquaintances in the target population between weekly sessions</li> <li>POL's conversational outcomes are reviewed, discussed, and reinforced at subsequent training sessions</li> <li>Logos, symbols, or other devices are used as 'conversation starters' between POLs and others</li> </ul> <p>Mpowerment; Kegeles et al. 1996</p> <ul style="list-style-type: none"> <li>Recruit and maintain a core group of 12 to 20 young gay and bisexual men to design and carry out project activities</li> <li>Recruit volunteers to help deliver services and to make important decisions about the program</li> <li>Use project coordinators to oversee project activities</li> <li>Establish a dedicated project space where many of the project activities can be held</li> <li>Conduct formal outreach, including educational activities and social events</li> <li>Conduct informal outreach to influence behavior change</li> <li>Convene peer-led, 1-time discussion groups (M-groups)</li> <li>Conduct a publicity campaign about the project within the community</li> </ul> <p>Real AIDS Prevention Project (RAPP); Lauby et al. 2000</p> <ul style="list-style-type: none"> <li>Conducting community outreach using peer volunteers</li> <li>Having one-on-one, safer sex discussions based on the client's stage of readiness to change</li> <li>Using printed stories about community members and safer sex decisions (role model stories)</li> <li>Obtaining program support from community organizations and businesses</li> <li>Sponsoring small group activities, such as safer sex parties and presentations</li> </ul>	<hr/> <p>under the rubric of "component analyses"; analyses of manuals of EBI; meta-analyses of EBI; and factorial intervention designs. There are many types of lenses and levels of abstraction encompassed in these approaches that range from the fine points of practice delivery to more abstract concepts reflecting constructs embedded in behavior change theories. For example, building on common factors in psychotherapy, mental health services</p>
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researchers (Chorpita et al. 2005, 2007; Garland et al. 2008) conducted content analyses of EBI manuals in conjunction with expert rating and confirmation. This work identified about thirty common "practice" elements at the level of specific techniques or procedures that are consistently implemented across EBIs for children and families. Example elements include psycho-educational *content* (e.g., principles of coping, problem solving, activity

scheduling, relaxation), and treatment *techniques* or *delivery devices* (e.g., skill training, modeling, rehearsal). Rotheram-Borus et al. analyzed manuals from five EBI for adolescent HIV prevention to identify a set of common *principles* or content themes (e.g., be prepared; distinguish facts from myths; act on facts, not feelings; Rotheram-Borus et al. in submission) and common *processes* or *techniques* (e.g., goals and agendas, group management strategies, competence/skill building, addressing identity and values; Ingram et al. 2008).

Meta-analyses have also been conducted to identify common elements supporting program efficacy across EBIs for HIV prevention (e.g., Albarracin et al. 2003, 2005; Noguchi et al. 2007) and parenting programs (e.g., Kaminski et al. 2008). These studies generally operate at a similar level of analysis to manual content analyses and focus on the finer points of practice delivery.

Common factors, by contrast, are intended to encompass broader constructs that support behavior change. One notable exception in the meta-analysis literature does approach the common factors level of abstraction. Albarracin et al. (2005) conducted a meta-analysis of 453 HIV-prevention intervention conditions in which the specific practice elements analyzed were synthesized to reflect and test the “assumptions” or constructs nested within theoretical models of behavior change. Two key results from this study support a common factors approach for HIV prevention. First, the constructs hypothesized to promote behavior by each theory are remarkably consistent across theories; provision of information; shaping of attitudes, norms, self-efficacy, and motivation; and building behavioral skills all play prominent roles in multiple theories. Second, the data provide good support for improved program efficacy when intervention strategies targeted these common constructs.

Notably, a frequent limitation cited across meta-analyses is the inconsistent reporting of intervention activities in published reports. This reflects one key aspect of the gap between intervention designers and implementers: a lack of congruence and specificity between scientists’ descriptions of their programs in research articles and what the programs actually do. Scientists may articulate their intervention’s theory of action and unique or innovative program activities, but fail to highlight other basic underlying factors that heavily influence program success.

Factorial intervention designs, a third type of component analysis, attempt to address this limitation by explicitly testing varying combinations of intervention strategies in experimental trials. While an ideal factorial intervention design might test 20 or more variations at the level of practice elements, the published reports to date examine only three or four broad-based strategies incorporating multiple practice elements. This level of abstraction

also approaches that of common factors, but perhaps overly broad. For example, Morisky et al. (1998, 2006) implemented interventions that provided sex worker psycho-education and STI treatment, changed sex work establishment policies, a combination of both strategies, and a standard-care control. The two primary intervention strategies broadly reflected environmental-level and personal-level constructs from ecological theory. Kalichman et al. (1996, 2005, 2008) designed similar three or four arm intervention trials to test the relative effects of strategies reflecting the Information-Motivation-Behavioral skills (IMB) theory of Fisher and Fisher (1992). Notably, IMB theory is a meta-theory and essentially a common factors approach rooted in behavior change theory (as opposed to practice) that reflects the high level of overlap in constructs embedded in various behavior change theories. We agree with the importance of information, motivation, and behavioral skills as the key person-level constructs that are incorporated into our suggested common factors. However, a focus solely on IMB limits emphasis on other factors, such as environmental or structural barriers to behavior change, social and community support, and maintenance over time.

### Common Factors in HIV Prevention

The common elements, processes, principles and components studies outlined above make important contributions to the broad agenda to identify underlying causal factors in preventive interventions. Yet, they operate at a level of analysis reflecting relatively specific messages, techniques, and delivery practices. In the case of the factorial intervention designs cited, the levels of analysis might be broad enough to reflect some of common factors that cut across EBI, but they do not provide usable alternatives to core elements for guiding adaptation of EBI with fidelity by providers. Our challenge is to identify a useful set of common factors.

Based on our research analyzing intervention manuals from EBI for adolescent HIV prevention that identified common principles and processes (Rotheram-Borus et al. in submission; Ingram et al. 2008), and a review of EBI core elements, a set of common factors emerged at a level of analysis similar to common factors in psychotherapy. These common factors operate at the highest level of analysis, what all effective programs do, or should do. We propose five common factors that successful EBI for HIV prevention share: (1) establish a framework to understand behavior change; (2) convey issue-specific and population-specific information necessary for healthy actions; (3) build cognitive, affective, and behavioral self-management skills; (4) address environmental barriers to implementing health behaviors; and (5) provide tools to develop ongoing



social and community support for healthy actions. We discuss each of these in more detail below.

#### Establish a Framework to Understand Behavior Change

A successful intervention must do more than address a specific behavior. It needs to frame its objectives in terms that help participants meet their life goals or that motivate or inspire participants to desire change. Thus, the intervention must frame the desired behavioral change within a broader transformation that allows participants to embrace the potential for a new identity and social role. Programs use a variety of frames for providing this motivation for change. Typically, these motivational frames are not part of the underlying theory of change identified by the program designers. For example, the adolescent program *Be Proud, Be Responsible* (Jemmott et al. 1992) aims to build ethnic pride; yet the program is based on the Theory of Planned Behavior, which does not include ethnic pride as a component; the program does more than the theoretical model suggests.

In creating frames for behavioral change, effective interventions share an emphasis on stories and role-playing exercises that dramatize the new social roles. Research on on-line communities that share information about living with HIV and learning to cope with the infection has confirmed the importance of transformational narrative in framing behavioral change associated with HIV risk reduction behaviors (Mohammed and Thombre 2005).

Once participants accept a new social role, the intervention can encourage behaviors that support that role. In addition, participants must feel receptive to the message of change delivered by the interventionists. Therefore, interventions need to provide settings that participants perceive as helpful, attractive, safe, accessible, and desirable. This is true of the setting in which the program is offered, the facilitators who offer it, and the process and materials the program uses (Rotheram-Borus and Duan 2003).

#### Convey Issue-specific and Population-specific Information

Interventions need to convey information that is specific to particular HIV-related issues or subpopulations that must be applied in a participant's life, but that goes far beyond the narrowly targeted behavior addressed by the intervention itself. For instance, prevention programs that target HIV-positive mothers or pregnant women need to convey information about parenting and improving quality of life. Programs that target youth need to incorporate knowledge about the facts of sexuality, childbirth or sexually transmitted diseases. Participants receiving psychiatric treatment need information about specific connections

between their mental health disorders and sexual risk factors, and these may need to be presented in nontraditional ways that can compensate for learning impairments or other barriers to information processing.

#### Build Cognitive, Affective, and Behavioral Self-management Skills

Successful interventions do more than change behavior; they teach participants to think differently, specifically how to become more self-aware of their emotional reactions and how to self-regulate their emotions, thoughts and actions. They also teach a range of generic problem-solving skills that include setting goals, developing plans, and problem-solving challenges that may arise on an ongoing basis and as life circumstances change. They help participants learn how to implement their plans, to practice, and to do it better over time. Behavioral and communication skill-building underlies much of the practical training that participants receive across interventions.

#### Address Environmental Barriers to Implementing Health Behaviors

Specific populations in specific context or geographic settings will face specific barriers to carrying out healthy new behaviors. Effective interventions provide participants with the means to overcome structural barriers encountered in their communities and societies. For example, runaway youth have basic needs to support behavioral changes, such as shelter, condoms, and access to health care (e.g. Rotheram-Borus et al. 1991, 2003b). HIV-positive mothers have a different set of needs: antiretroviral therapy at childbirth, access to HIV testing for their babies, and ongoing health care (e.g. Rotheram-Borus et al. 2003a). If interventions fail to address environmental barriers to implementing the specific pathway to safer acts, no change can occur or be sustained.

How interventions specifically address environmental barriers and the stated emphasis on such barriers varies by program. At minimum, all EBI *indirectly* target environmental barriers by helping participants identify, anticipate, and problem solve barriers to the new behaviors, as well as meeting the instrumental needs that drive vulnerability to HIV, AIDS and other negative outcomes. These skills are critical because the skills can generalize to the varying situations, evolving contexts, and new barriers that can not be anticipated by EBI designers.

Interventions may also *directly* target environmental barriers via community-level and structural interventions that change community norms or policies, or even simply by ensuring access to condoms and healthcare (Sumartojo 2000). Through our extensive experience implementing

“individual-level” interventions such as Street Smart (Rotheram-Borus et al. 1991) we know that environmental barriers are targeted both indirectly and directly even though this program is typically labeled as an individual-focus intervention. The research team did not emphasize these primary program components in program descriptions or core elements. We are strong proponents of structural interventions for their ability to address environmental barriers for participants and for population segments that can not or will not participate in EBI. Almost universally, EBI for HIV combine indirect and direct strategies for addressing environmental barriers. However, the feasibility of specific structural strategies is heavily dependent on contextual factors, such as target populations and their capacities, program resources, programmer expertise, funding priorities, and political climate.

#### Provide tools to Develop Ongoing Social and Community Support

Ongoing social support for new behaviors is critical to maintaining behavioral change over time. Successful interventions either provide ongoing sources of social support or give participants the tools to develop this support for themselves. These may include ongoing healthcare or counseling, follow-up sessions with intervention providers to assess progress or changing needs over time, or establishing self-help networks as sources of ongoing support (e.g. Kelly et al. 1992; Knowlton et al. 2004). Community-level interventions, in particular, place strong emphasis on ongoing social support by shifting community norms around targeted behaviors (Kelly et al. 1997).

Successful behavioral change is not a one-time event. Change occurs over time, starting with small steps that accumulate to make large differences. Furthermore, change must be maintained over time and incorporated into individuals’ daily lives and social relationships through incentives, practice, and by supporting participants in building social or community support. Processes and mechanisms for initially changing a behavior may differ from those that maintain it (Marlatt and George 1998). Thus, the most successful interventions must achieve outcomes in addition changing the targeted behavior: adherence to intervention participation, and maintenance of behavioral changes over time (NIMH Intervention Workgroup 2001).

Factors that attract participants to an intervention may differ substantially from those that lead to behavioral change. For example, accessibility (e.g., transportation, affordability, and child care), provider attitudes, and consumers’ perception of the setting may affect participants’ decision to participate in an intervention (Noguchi et al. 2007). Attending an intervention implies that a participant

is receptive toward the program and suggests a willingness to adopt the program’s target behaviors in a non-research environment. Acceptability and adoption are critical for participants, the providers responsible for implementing the program, and the agencies funding the program. Intervention manuals and journal articles are often silent about issues of participation and maintenance of behavior change, although core elements of some programs (i.e., community-level POL and Mpowerment) do emphasize these issues. These issues are critical to broad dissemination of EBI. The successful delivery of prevention programs must facilitate participation, adherence, and ongoing support for maintenance of intervention gains (NIMH Intervention Workgroup 2001). A plan for maintenance through all stages of progress (“cradle through maturity”) may be desirable for most prevention programs (Duan and Rotheram-Borus 1999).

#### Conclusion

Understanding the common factors in effective HIV prevention interventions informs the identification of robust factors in prevention design across target populations, prevention researchers’ academic disciplines, and theories of change. Designers of effective HIV prevention interventions share more in common than they typically acknowledge. While researchers may be working with different underlying theories, most successful EBI have translated these theories into a strikingly similar set of intervention practices: the common factors. We believe that most effective prevention programs are instantiations of these common factors. It is helpful to consider them as case studies in implementation of these common factors, not as inviolate programs which cannot be touched, lest their effectiveness be stripped away. As a field, we need to move away from the idea that dissemination of effective interventions necessitates a slavish devotion to the exact replication of specific programs at the level of a sequence of activities. The “level” at which replication with fidelity is needed requires substantially more research. There are at least five levels: (1) activity sequences; (2) best practices or processes; (3) behavioral rules or principles; (4) components; and (5) factors. Other researchers may identify a different level needed for replication with fidelity.

For researchers, we believe that the identification of common factors will help promote cooperation and coherence in the field. Basing interventions on different models of behavior change has the unfortunate result of dividing the field into theoretically oriented camps. While certainly the divide between AIDS Risk Reduction Model and Social Learning Theory is not nearly as contentious as what psychotherapy sees in the gulf between Cognitive

Behavior Therapy and Psychodynamic Therapy, a move toward common factors would assist greater collaboration. If the emphasis moves toward outcomes and what common factors lead to preventive outcomes, theoretical orientations become the basis of fruitful discussions of variables relevant to behavior change. The identification of common factors does not obviate the possibility that some behavior change models or specific intervention protocols contribute additional variables that effect behavior change above and beyond the common factors. Rather, we suggest that common factors are likely the source of a great deal of the positive change seen across EBI. Once a base is established, more innovative theories, interventions, and practices may emerge. Rather than focusing on relatively small differences between similar programs, true innovation may emerge. In particular, the possibilities created by dramatic technological breakthroughs in internet networking, embedded sensing, drug discovery, and the creation of computerized multi-media transformative experiences may then stimulate paradigm shifts in behavioral interventions.

Moving beyond the specific nature of EBI activities toward common factors will help focus new research in the field of HIV prevention. As new interventions are developed for new risk groups or new techniques are developed for existing risk groups, researchers will have a strong base of necessary components identified by the common factors. This should reduce the number of unsuccessful intervention trials and increase the effectiveness of the new programs. As of now, the field has no such set of necessary components, yet we would argue that interventionists who have repeatedly designed and tested successful programs implicitly employ the common factors we have identified here. Moreover, a greater degree of experimentation with multiple modes of delivery and new delivery technologies—those that recognize the common factors while allowing for adaptation in other areas as needed—can lead to broader dissemination of HIV EBI.

Perhaps the greatest potential benefit of the common factors is to providers of HIV prevention services, not researchers. The HIV pandemic is a moving target and we have not achieved our prevention goals. After two decades of effective intervention design, it should not take years to get new programs into the field or to address evolving needs of risk groups. Current practices for the dissemination and adaptation of EBI rely on a complex set of logic models and a locked step sequence of repeat testing, adaptation, and implementation. These practices presuppose a level of expertise unavailable to many community-based organizations who do not have the time or funding to invest in the capacities necessary to ensure adaptation with fidelity of a specific intervention to a new target population.

These common factors may help transform the adaptation process of EBI. Local tailoring may allow each

provider and community to retain the common factors of an EBI while adapting the program to local conditions. We have argued that effective EBI must: (1) establish a framework to understand behavior change; (2) convey issue-specific or population specific information; (3) build cognitive, affective, and behavioral self-management skills; (4) address environmental barriers to implementing new behaviors; and (5) provide tools to develop ongoing social and community support. Rather than being a definitive list, we hope this list stimulates discussion and research. Research may identify the robustness of common factors; meta-analysis would be a logical first step, but randomized control trials are also needed. If these common factors or a revised list reflect the robust components in EBI, a new generation of EBI will emerge that may focus on a very different research agenda: continuous quality improvement for adaptation, effectiveness, and diffusion of interventions by providers in real-world settings (Rapkin and Trickett 2005).

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