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How Prevention Science Can Inform Service-Learning Research

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Prevention science, like service learning, is a relatively young field. However, in a short period of time, prevention has made significant progress in its scientific maturation, while SL research has lagged behind. Prevention science has made rapid progress because of its recognition of a multistage research cycle, reliance on interdisciplinary work, and success in developing strong university-community partnerships. Given the prevailing climate for accountability in education, SL researchers will need to increase the scientific rigor of their work. SL researchers should become more familiar with how prevention scientists conduct research. By following the lead of our prevention science colleagues and, where possible, teaming with them as interdisciplinary colleagues, SL researchers may move the field forward more rapidly.

Prevention research that is related to children and youth problems (e.g., adolescent problem behaviors, psychiatric disability, school refusal and failure, family dysfunction) is a relatively young field, dating back approximately 25 years (Coie, 1996; Flay & Collins, 2005; Ferrer-Wreder, Stattin, Lorente, Tubman, & Adamson, 2004). The term prevention science (PS) was developed at the 1991 National Institute of Mental Health (NIMH)-sponsored National Prevention Conference. PS was described as a *research* discipline "focused primarily on the systematic study of precursors of dysfunction and health-called risk and protective factors respectively" (Coie, et al., 1993, p. 1013). The goal of prevention science is to prevent or moderate major human dysfunctions, including the elimination or mitigation of the causes, incidence, and prevalence of those dysfunctions (Coie, et al., 1993). Despite its relatively neophyte status, prevention science has made rapid progress in developing and integrating already existing theory from various disciplines and conducting basic and applied research using sophisticated methodology and data analytic techniques (Cohen & Fish, 1993; Flay & Collins, 2005; Office of Substance Abuse Prevention, 1990; Peters & McMahon, 1996; Ferrer-Wreder, et al., 2004). It is important to note, that the 1991 National Prevention Conference provided prevention researchers with both a clear definition of what PS was and suggested ways to conduct their research (i.e., study the reciprocal interplay between risk /protective research and controlled intervention trials which were to be informed by basic research on risk and protective factors, with field trials to follow). It is fair to say that PS has had well articulated "marching orders" emanating from leading researchers in the field and large funding agencies.

Service learning (SL) and its research come from very different roots indeed. In the same year of the National Prevention Conference, a Wingspread conference sponsored by the National Society for Experiential Education and the Johnson and MacArthur Foundations took place. While few themes for future SL research and some calls for theory and comparative research emerged from the conference, generally the conference was non-directive about how knowledge in the field should develop (Howard, Gelmon, & Giles, 2000). Today, relative to the large number of people in the SL field, only a few researchers view SL as a mode of research or even as a disciplinary lens (Billig & Eyler, 2003; Butin, 2003; Eyler, 2002; Furco & Billig, 2002), while most continue to think of it as solely a form of pedagogy. It may not be surprising then that SL is beset with multiple conceptualizations (Butin, 2003). These include the technical (i.e., understanding the characteristics of SL, as well as its efficacy, quality, efficiency, sustainability), cultural (i.e., dealing with how individuals make sense of themselves, questions of acculturation, fairness, tolerance, morality, and ethics in the development and delivery of SL), political (i.e., questions of power and power imbalance as relates to competing constituencies in SL), and the postculturalistic (i.e., how SL impacts on and is impacted by societal norms) perspectives. SL research, therefore, "traverses a vast, multidisciplinary terrain mak[ing] it more difficult to ascertain which questions are most significant or which theories or methodologies are most appropriate to guide the investigation" (Furco & Billig, 2002, p. 16). In some sense then, unlike their PS colleagues, SL researchers face significant challenges in deciding what to study, by what means, with what partners, and with what funding support.

Despite important differences between PS and SL, this paper suggests that SL researchers consider becoming familiar with work in PS as a way to bring greater coherence to some aspects of their research, enhance strategies to develop sustainable partnerships with communities, and work in a more multidisciplinary fashion. Indeed, Eyler (2002) has said that SL researchers "need to work with research scholars from related fields to bring some theoretical

rigor to the design of our research programs' (p. 12). PS may prove to be a valuable interdisciplinary framework for some SL researchers.

The Promise and Challenge of SL

A number of studies are accumulating which suggest that quality SL has a positive impact on various academic/cognitive (Billig, 2000a; 2000b; Eyler & Giles, 1999; Strage 2000; 2004), social-emotional (O'Bannon, 1999), character development (Jones & Abes, 2004), and civic engagement (Billig, Root, & Jesse, 2005) outcomes. The benefits of SL have been demonstrated in a number of diverse settings across various ages and using differing methodological approaches. It should not be surprising then that a number of "districts and schools have adopted service-learning as a special strategy to meet the needs of their at-risk or disaffected youth" (Root, 2004, p. 2). There is some reason for optimism about SL as an approach to help youth become excited about learning and to provide them with more meaningful connections to their schools and communities (Root, 2004; Shumer, 1994). The promise of SL is indeed intriguing.

Unfortunately, SL research is based on research that is "comprised of a patchwork of small, independent, and *disconnected* studies that have sought to fill very big gaps in knowledge about service-learning impact, implementation, and institutionalization" (Furco & Billig, 2002). Unlike PS, it seems that SL is variously constructed with a multiplicity of goals and approaches that may hamper research in the field. Therefore, it has been difficult for SL researchers to systematize and organize how they think about and research theory, practice, and impact (Aronson, et al., 2005; Bringle, 2003; Butin, 2003; Jacoby, 1996; Ziegert & McGoldrick, 2004).

Furthermore, despite calls for increased rigor in the field (Aronson, et al., 2005; Eyler, 2002), a number of SL studies are beset with problems of self-selection, over-reliance on the self-report of experience, under-reliance on experimentation, and so forth (Billig & Eyler, 2003; Eyler, 2002; Furco & Billig, 2002). It remains difficult, therefore, to reach substantive conclusions about the process and outcomes of SL, or for the research to build upon itself (Billig & Eyler, 2003; Bringle & Hatcher, 2000). The quality of SL research continues to be criticized both within and outside the field (Billig, 2000a, 2000b; Bringle, 2003; Bringle & Hatcher, 2000; Butin, 2003; Eyler, 2000; 2002; Eyler & Giles, 1999; Furco & Billig, 2002; Ziegert & McGoldrick, 2004). In contrast, the field of PS has developed relatively rapidly and in doing so has overcome some of the problems still facing SL.

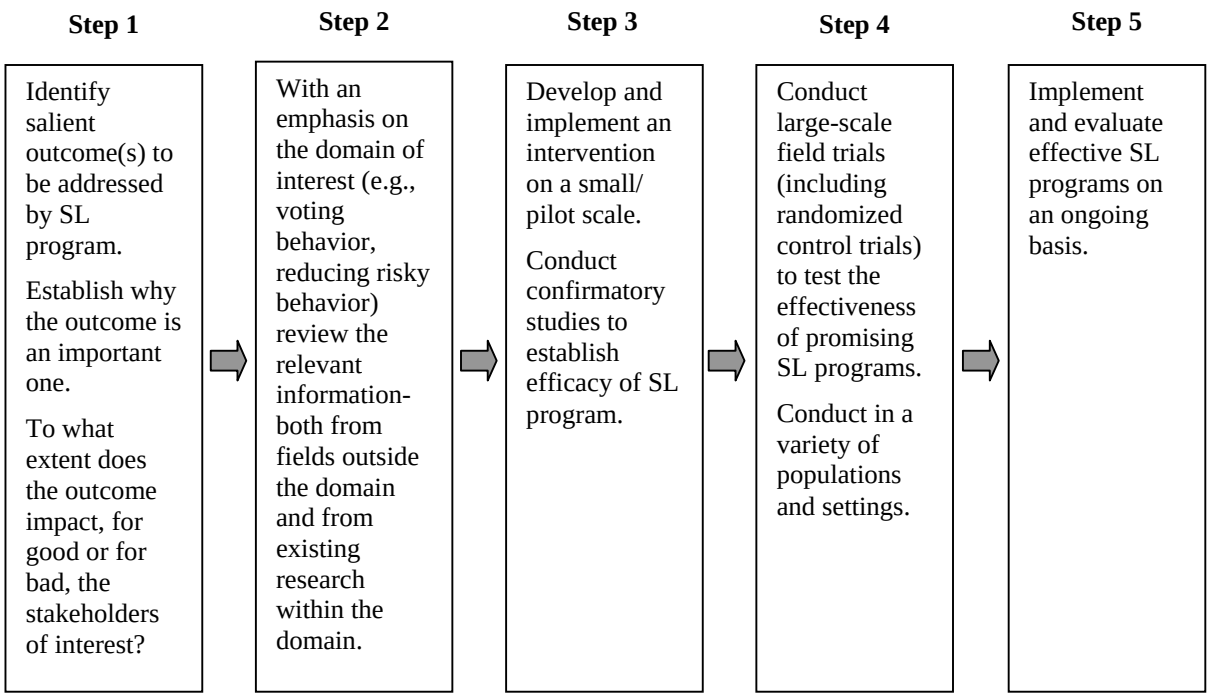
Three Key Guideposts in PS and their Application to SL

PS has moved forward so quickly largely due to its focus on three guideposts: using the multistage research cycle, taking a multidisciplinary approach to scientific inquiry, and developing strong university-community partnerships. As will become clear, SL and PS researchers have engaged in some similar activities; however, PS appears to do them more consistently and, to this point, more successfully.

Multistage Research Cycle. Prevention scientists have rallied around an organized approach to research, recently referred to as the "multistage research cycle" (Mrazek & Haggerty, 1994; Weissberg & Greenberg, 1998). The multistage research cycle has provided a solid foundation for PS, helped foster prevention research activities at many universities since the early 1990's, and sped progress in the field (Kellam, Koretz, & Moscicki, 1999). Significant support for the development of the multistage cycle came from researchers and key stakeholders within the National Institutes of Health (e.g., National Institute for Mental Health), the National Academy of Sciences (e.g., Institute of Medicine), and by the United States Congress itself (Heller, 1996). Therefore, relative to SL research, a good deal of PS research has been driven from the top-down, making adherence to a research cycle more likely. SL researchers should consider how following the multistage cycle might add rigor to their work.

The multistage research cycle (see Figure 1) includes problem identification, literature review and synthesis, pilot study activity, large-scale field trials, and ongoing evaluation of programs. In problem identification, researchers identify the problem that they wish to address with a prevention intervention. In PS, many of these problems have been identified as national priorities (e.g., drug and alcohol abuse, mental disorders, abuse and neglect of children). Moreover, many of the priorities identified are driven by the National Institutes for Health units particularly concerned about children and youth (e.g., NIDA, NICHD). The identification of problems (or research questions) in SL has been more difficult and more idiosyncratic (Furco & Billig, 2002). Prevention science researchers, even in this first step of problem identification, often begin attempting to develop community relationships to better understand *key environmental and ecological issues*, as well as to set the stage for long-term partnering. SL, by its definition, requires the development of community relationships. Indeed, there are some excellent examples of how SL researchers have, early in problem identification, allied with community stakeholders (see for example, Weinberg, 2003). However, it is important to note, that SL researchers, for a myriad of reasons (many largely

FIGURE 1
The Multistage Research Process as Might Be Applied to SL.



beyond their control), have had more difficulty than PS researchers in sustaining community partnerships (Cushman, 2002). More on this point later.

After the problem is identified, an in-depth examination of the relevant scientific literature from related disciplines is conducted. This step is particularly important for the identification and articulation of relevant theoretical models. For example, in the Fast Track Program [Conduct Problems Prevention Research Group (CPPRG), 1992], a detailed theoretical model describing the development of antisocial behavior in very young children was articulated. The model focused on deficient parenting, poor relationships between parents and children, and various cognitive, social, and emotional deficits which contribute to antisocial acting out. This comprehensive model of antisocial behavior became the basis of a preventive intervention. Unfortunately, SL has demonstrated a relative lack of theoretical and conceptual models in the field (Aronson, et al., 2005; Bringle, 2003; Ziegert & McGoldrick, 2004). As a result, empirical work in SL has become somewhat "ad hoc and incoherent" (Ziegert & McGoldrick, 2004, p. 32.). SL researchers should continue to create and/or test theories from other various disciplines that relate to learning and development (Furco & Billig, 2002; Bringle, 2003). Quite recently, a promising conceptual model of SL and a strong inference plan for the theory's assessment have been presented to the field (Aronson, et al., 2005), adding to the small but growing number of rigorous, conceptually driven research studies in SL (see for example, Allen, Philliber, Herrling, & Kuperminc, 1997; Markus, Howard, & King, 1993; Santmire, et al., 1999). In the Aronson, et al., (2005) model, moderators (e.g., gender, academic ability, prior SL experience, parental socioeconomic status), a central mediator (cognitive complexity), and both short- (e.g., academic achievement, personal social emotional development, learning appreciation), and long-term outcomes (e.g., civic engagement) are elucidated. The conceptual model is based on learning and cognitive theory, is supported by prior empirical findings, and is falsifiable. More models of this kind should be generated and tested in the SL field.

After all pertinent information has been reviewed and theoretical models identified, prevention researchers often conduct small-scale, rigorously designed pilot studies to test the methods, procedures, and efficacy of their program. The Society for Prevention Research (SPR) has published *Standards of Evidence: Criteria for efficacy, effectiveness, and dissemination* to "determine the requisite criteria that must be met for preventive interventions to be judged tested and efficacious or tested and effective" (SPR, 2004, i). SPR published the *Standards* "to articulate a set of principles for identifying prevention programs

and policies that are sufficiently empirically validated" (SPR, 2004, p. 1). Prevention scientists who are conducting intervention trials, therefore, have at their ready a clearly articulated approach to conducting studies that produce strong-inference results. Pilot studies in the prevention sciences are often undertaken in a community institution such as a school. Given the exploratory nature of pilot studies, alterations to the design are usually made prior to a large-scale trial. In large-scale trials, effectiveness can be examined using multi-site and more naturalistic field conditions (e.g., several schools from a number of school districts which are randomly assigned to treatment and control conditions). On-going evaluations (including benefit and cost analysis) are typically built into prevention trials. These provide more reliable information than one-time assessments. Moreover, since effects of interventions may unfold or manifest over time, multiple evaluation points are needed for accurate estimates of effect.

Relying on the multistage research cycle, prevention researchers have built a strong base of knowledge by articulating detailed theoretical models and incorporating already existing theory from various disciplines, developing preventive interventions under-girded by that theory, using methodologically sophisticated designs and cutting-edge statistical analyses, disseminating knowledge and programming in creative ways, and developing systems of sustainability (Ferrer-Wreder, et al., 2004; Offord, 1996). It should not be surprising then that prevention research with children and youth has become highly visible, produces meaningful results, and receives significant grant funding (Ferrer-Wreder, et al., 2004). The Infant Health and Development Program (Brooks-Gunn, et al., 1994), Nurse-Family Partnership (Olds, 2002), DARE to be you (DTBY; Fritz, Heyl-Miller, Kreutzer & MacPhee, 1995), Incredible Years (Webster-Stratton, 1998), Strengthening Families Program (Kumpfer, Molgaard, & Spoth, 1996), Guiding Good Choices (O'Donnell, Hawkins, Catalano, Abbott, & Day, 1995), Focus on Families (Catalano, et al., 1999), Fast Track (Conduct Problems Prevention Research Group, 1999), and Promoting School-Community-University Partnerships to Enhance Resilience (PROSPER; Spoth, Greenberg, Bierman, & Redmond, 2004) are but a few of the highly visible and well-funded prevention programs that have been developed for children and youth in the past decade.

While SL research started with less top-down influence and more democratic roots, there are many SL researchers who desire to demonstrate the efficacy and effectiveness of SL, particularly in light of its intriguing promise (Eyler, 2002). Researchers interested in demonstrating intervention effects should use strong-inference methods, similar to those used in the multistage research cycle (Boruch, de Moya, & Snyder, 2002; Brooks-Gunn, 2004). Given the accountability movement that has developed in education, partly due to the *No Child Left Behind Act of 2001*, SL researchers are likely to face increased pressure for the kind of rigor seen in PS research. Indeed, the U. S. Department of Education, via the Institute of Education Science (IES), has published guidelines to assist researchers identify and implement educational practices supported by rigorous evidence (Boruch, et al., 2003; Myers & Dynarski, 2003). These guides set forth several key elements that are required for *rigorous* studies in education. These elements include true random assignment to intervention and control conditions, use of power analyses, clear articulation of the intervention, insurance that no systematic differences exist between the intervention and control group prior to the intervention, use of reliable and valid outcome measures (including objective indices), plans to reduce attrition, use of appropriate statistical analyses, and capture of short- and long-term outcome data. While there is not unanimity of agreement on the IES guidelines within SL or education, randomized control field trials **(**RCFT's) have been identified as the "best tool for attributing observed student change to whatever classroom or school option is under consideration as a possible cause" (Cook, 2002, p. 176). Moreover, the supremacy of RCFT's over other evaluation strategies has long been held in most social science disciplines primarily because it protects against selection bias and internal threats to validity (Cook, 2002; 2004; Cook & Campbell, 1979). Furthermore, RCFT's provide the best assessment of intervention effects on students in a treatment group relative to those not exposed to treatment (Holland, 1986; Rubin, 1974). In PS, RCFT's have become an important methodological staple (Ferrer-Wreder, et al, 2004; Mrazek & Haggerty, 1994), while they tend to be underutilized in SL (Aronson, et al., 2005).

The IES guides also provide information on requirements to establish "possible evidence of effectiveness." Possible evidence can be garnered using quasi-experimental (or comparison group) studies in which comparison groups are very closely matched on theoretically relevant characteristics, comparison group participants have not declined participation in the intervention group, intervention and comparison groups and outcome measures are chosen prior to the administration of the intervention, and all the elements outlined in the guidelines for "rigorous" evidence are followed except for random assignment to conditions. These kinds of studies, a number of which have been undertaken in SL, can be valuable in generating hypotheses, but ultimately their results should be confirmed in randomized control trials. Furthermore,

the IES discourages the use of pre-post designs because they often produce erroneous results. Pre-post designs are frequently used in SL research, so their results should be interpreted with caution.

It must be clearly stated, however, that a number of SL researchers and theorists have suggested that new, as of yet identified, methodological approaches are needed to assess the impact of SL on communities, echoing sentiments from other social science disciplines (see for example Schorr & Yankelovich, 2000). For example, Weis (1995) has stated that the problems and complexities in evaluating SL's impact require the development of new evaluation paradigms, including those for questions that RCFT's cannot answer. Moreover, the IES guidelines have not been greeted with enthusiasm by a number of educational researchers (Dan Butin, personal communication). There are also a number of leading educational and social science researchers who feel that the identification of RCFT's as the scientific gold standard is mistaken. McCall & Green (2004) note: "Research methods are tools that must match the scientific, practice, and policy tasks, and the research question and intervention should dictate the method, not the reverse. We are more likely to maximize our contribution if we broaden our methodological value system to recognize the benefits and limitations of all methods" (p. 12). Therefore, while the Society of Prevention Science and Institute of Education Science have published guidelines for the conduct of "rigorous" research, it is important to note that diversity of approach is important in any discipline.

Multidisciplinarity. Prevention science has also progressed rapidly because university researchers and program evaluators have worked in a highly interdisciplinary manner (see for example, Coie, Miller-Johnson, & Bagwell, 2000). Prevention science has been influenced by many disciplinary fields including molecular biology, genetics, population and developmental epidemiology, psychology, sociology, and family studies, to name a few.

Biglan (2003) has noted that prevention researchers have been particularly successful at not only bridging across disciplines, but also effectively using features of paradigms across different prevention problems:

> For example, design and analytic techniques have been borrowed from one area of substantive research and applied to another, as have general orientations such as life course developments and community epidemiology. Research on preventing the development of antisocial behavior has been strengthened by the integration of epidemiological and developmental perspectives. There have also been several efforts to identify cross-cutting theoretical principles for prevention science. (p. 213)

In other words, prevention researchers are attempting where possible to seek out multidisciplinary principles that provide explanatory power in various domains of inquiry.

PS is also on the leading edge of developing new interdisciplinary relationships for the effective and efficient delivery of prevention interventions to communities (Molgaard, 1997). In particular, prevention researchers have begun to team with outreach and extension units at state and land grant universities to extend their reach into various communities. Outreach and extension professionals have become key interdisciplinary partners because of their keen insights on the ecological issues occurring in areas targeted for intervention (Mincemoyer, Perkins, & Lillehoj, 2004). Moreover, these "in the field" faculty members are accustomed to delivering outreach information to communities. Prevention researchers are now using the expertise and experience of outreach and extension faculty to deliver empirically supported interventions in communities where extension and outreach are housed and to assist in the maintenance of long-term relationships (Goldberg, Spoth, Meek, & Molgaard, 2001). These efforts have largely been undertaken at state and land grant universities and, therefore, have limited applicability to smaller colleges and universities, although smaller schools without such resources might consider partnering when possible.

SL, by its very definition and nature, is interdisciplinary and cooperative (Eyler & Giles, 1999). While there are some examples of interdisciplinary research efforts within SL (e.g., Aronson, et al., 2005; Steinke, Fitch, Johnson, & Waldstein, 2002), many studies fall within a narrow range of education (e.g., curriculum and instruction, education policy, higher education). Leaders in the field, however, have recognized the ripeness of the field for more interdisciplinary work. For example, Furco and Billig (2002) recently stated that because of SL's "boundary spanning nature, service-learning research can be studied using a wide variety of theoretical and disciplinary frameworks to investigate a broad range of program outcomes" (pp. vii-viii). Indeed, a number of theories developed and refined within and across various disciplines are relevant to service learning. Eyler (2002) has suggested that SL researchers could draw on theories of identity development, cognitive development and cognitive science, social capital theory, and change theory, among other theories from social and community psychology. Furco and Billig (2002) have stated that SL researchers "need to focus more attention on detailing the theoretical aspects of their work, connecting their work more fully to appropriate, existing theories both in their disciplines and in others" (p. 20).

To work in a more interdisciplinary fashion, SL researchers should try to make use of interdisciplinary institutes, consortia, and centers on university campuses. These interdisciplinary entities are designed to assist faculty to make collaborative connections across disciplines (Aronson & Webster, in review). For example, at Penn State University the Children, Youth, and Families Consortium (CYFC) has helped faculty researchers from psychology, curriculum and instruction, agricultural education and extension, higher education, and human development coalesce around SL. Finally, SL researchers should also attend the Annual International Conference on Advances in Service-Learning Research. Here, hundreds of researchers and practitioners from many disciplines converge to discuss cutting-edge topics in SL research.

University-Community Partnering. The development of strong university-community partnerships in PS has yielded three key benefits. First, community/contextual variables and impacts are well documented and assessed (Kellam, et al., 1999). Second, strong, trusting community partnerships lead to the "acceptance of rigorous scientific designs and procedures" (Kellam, et al., 1999, p. 479). As previously mentioned, prevention researchers have had tremendous success implementing strong inference methodology and evaluation techniques. Random trials require the establishment of control groups who by design do not receive the treatment of interest. Without strong community buy-in, it is unlikely that RCFT's will be embraced. Finally, strong university-community partnerships lead to increased rates of participation (Kellam, et al., 1999). For example, the Baltimore Prevention Program (Kellam & Hunter, 1990) worked with school leaders, teachers, and parents to develop a RCFT involving 28 schools and 3,000 children and families.

Prevention researchers working with children and youth have a history of building long-lasting community partnerships. This should not be surprising given the important role of the public health model in prevention, the nature and magnitude of the problems typically addressed, and the importance of developing a comprehensive understanding of environmental/ ecological context. Indeed, many prevention researchers rely on the Collaborative Community Action Research model (CCAR; Heller, 1996b). The CCAR model asserts that it is preferable to involve local community members throughout the entire multistage research cycle so that emergent understanding and solutions are collaborative. Another important tenet of CCAR is that action and understanding must be grounded in the understanding of specific ecologies and contexts. Therefore, there is a focus on understanding the *community as a unit of analysis*, evaluation of the collaborative process is a legitimate source of research findings, and the researcher becomes a participant-conceptualizer who facilitates program development and evaluation. Therefore, PS researchers spend considerable effort gaining entry to target audiences directly through schools, social programs, workplaces, day care centers, religious organizations, and other groups.

Prevention researchers have argued compellingly about the importance of the entry process in the establishment of viable community-based programs (Elias & Clabby, 1992). It has been suggested that, unless community members agree with the basic purpose and method of a prevention program, and unless they feel some "ownership" of the programs, they will not be motivated to support the implementation of the program in the long run. Prevention programs (e.g., Fast Track, PROSPER) require the active involvement of community members. The entry process operates at both a "formal" and "informal" level. At the formal level, the approval and support of key stakeholders (e.g., superintendents, principals, school boards in school-based prevention) is needed to introduce prevention programs into communities. At the informal level, it is critical to gain the active support of key agents in the intervention process (e.g., teachers, parents). Bierman and CPPRG (1997) provide a detailed explanation of the steps they used to partner with formal and informal stakeholders to implement the Fast Track prevention program in several rural Pennsylvania school districts. The significant amount of staff time and dedication required to develop, nurture, and sustain *trusting* university researcher-community partnerships cannot be underestimated. In the case of Fast Track, even after "formal" channels had approved the program implementation, many individual meetings with teachers (key implementers of the prevention program) focused on such needs as developing relationships between program staff and teachers, understanding relevant historical and personal issues within schools, joint problem-solving, and collaborating in negotiation. Other important dynamics considered in the establishment of university-community partnerships related to Fast Track included sensitivity to geographic culture, the prevailing political climate, pragmatic obstacles, and use of language. Clearly, prevention researchers have made important strategic partnerships with key community stakeholders.

One of the most exciting elements of the promise of SL is its potential to make "unique contributions to addressing community, national, and global needs" (Jacoby, 1996, p. xvii). Moreover, SL by its definition cannot happen without connection to communities. The success of community collaborations in SL has been varied. For example, in many rural communities long-established traditions of

SL exist between schools and communities (Education Commission of the States, 2000). In some urban communities, strong community ties have been built. One notable example of this is occurring at the University of Pennsylvania's Center for Community Partnerships. Beginning in 1985, Penn has engaged with local public schools in a collaborative partnership called the West Philadelphia Improvement Corps (WEPIC). The development of a number of SL courses at Penn "has provided the integrative, community-focused organizational vehicle that helps these courses make a practical difference in West Philadelphia schools and their communities" (Benson & Harkavay, 2002, p. 22). Other mutually beneficial relationships have been developed across the country (Abravanel, 2003; National Commission on Service-Learning, 2002). Despite these successes in building community connections, SL researchers face some challenges and difficulties.

The first challenge revolves around the issue of who is being served by SL. Several leading researchers in SL have suggested that SL is largely designed to serve students and not communities (Stoecker, 2003). Moreover SL courses are "constrained by standards of teaching, grading, and assigning of credit hours, as well as by curricular demands" (Stoecker, 2003, p. 39) that can detract from connection with communities. Second, the course-based nature of SL provides a number of practical limits on the extent to which community partnering can be formed. As is all too common, SL courses can be dropped from catalogues and SL teachers can leave. A poignant example of this was seen when, after working with many diverse stakeholders in West Philadelphia to develop safe havens for youth at risk, efforts came to an end when the financial support for the course was pulled after one semester (Kinnevy & Boddie, 2001). Therefore, even in cases where SL projects with communities are constructed with the best of intentions, they may end up becoming "one shot deals" (Cushman, 2002). Third, some have argued that even in cases where the SL project is trying to serve student and community, the impact on community is not being sufficiently evaluated for short- or long-term outcomes or social change (Stoecker, 2003). As a result, little remains known about the effect of SL on communities themselves (Jacoby, 2003). Fourth, while many in the SL field have spent time describing the *need* to develop relationships with communities (see for example, Enos & Morton, 2003), much less has been written about the "how to" of developing these partnerships. It is important to note that several recent notable exceptions have been published, including the summer 2003 issue of the *Michigan Journal of Community Service Learning* which is devoted to community-based research in SL and the book *Building Partnerships for Service-Learning* (Jacoby & Associates, 2003). Finally, Cushman (2002) has argued that the development of long-lasting community relationships require that the "role of the professor as researcher must be firmly identified and carefully articulated when entering into service learning" (Cushman, 2002, p. 43) so that all stakeholders are collaboratively engaged in inquiry, teaching, and service. Moreover, without a well developed research methodology SL professors have difficulty communicating to students and the community, leaving many participants confused and frustrated (Cushman, 2002).

An interesting distinction exists between SL and PS in the manner in which community collaboration takes place. SL researchers appear much more likely to adopt "community-based research (CBR). CBR works by engaging the collaborative enterprise between all stakeholders, validating multiple sources of knowledge, and using social action and change as a means of enhancing social justice (Stoecker, 2003). Therefore, SL researchers may be constrained (and happily so) by the kind of research questions they undertake and the manner in which those questions are answered. In particular, CBR (like other forms of participatory action research) often avoids the traditional expert/client dichotomy and seeks to balance power differentials inherent in some kinds of research designs and applications. In PS, while developing partnerships with, and learning about and from, communities, researchers are much more likely to enact the role of expert or consultant. Oftentimes, when faculty members act as consultants/experts they; bring to a community a strong base of knowledge (theoretical and empirical), have typically identified the community problem in advance, and are seen by the community as needed leaders (Todd, Ebata, & Hughes, 1998). In some cases, "communities have identified a specific need, believe a faculty member can meet that need, and simply want what the faculty member has to offer" (Todd, et al., 1998, p. 243). In these cases, PS researchers may find it easier to negotiate a path to engagement relative to their SL peers.

Applying Lessons from Prevention Science to Service Learning

Given the calls for increased rigor both within the field (Aronson, et al., 2005; Eyler, 2002) and from governmental and funding agency mandates for strong inference educational research, SL should increasingly pursue strong-inference investigations. By following the multi-stage research cycle, PS has made

significant scientific strides in developing and evaluating their interventions with children and youth. Prevention researchers have developed interventions based on elegantly conceptualized theoretical models, and they have tested those models using rigorous methods (such as RCFT's). This strong-inference approach has generally been lacking in SL research. As a result, SL research may have reached a plateau. Very few definitive statements can be made about SL's value to students or to communities. The IES guidelines provide a useful roadmap for researchers interested in establishing the efficacy and effectiveness of SL. While it is clear that research in SL is still accumulating, more researchers should undertake evaluation studies using rigorous methods. Without such a development, progress in the field will be slow, and, just as importantly, internal and external support for its study and evaluation may wane with time. By attending to the multistage research cycle, a more common frame of reference may emerge for SL researchers in which they speak a more similar language, become more firmly entrenched within academic departments and university research centers, have numerous outlets for publication and dissemination of information, and become more competitive in obtaining external funding. However, to meet the challenges associated with the multistage research cycle, SL researchers may need to re-train (e.g., become more sophisticated in research methodology and statistics) or, at minimum, partner with methodologists, statisticians, and professional evaluators.

Prevention scientists have also successfully pursued multidisciplinary partnerships. Some of this, of course, has been out of necessity. The problems being addressed by PS (e.g., drug use, school failure) are complex and multifactorially determined (Coie, et al., 1993). The promise of SL is also to positively impact on the great needs and problems of our society. Surely, then, similar kinds of partnerships should continue to develop in SL. Indeed, PS and SL researchers should increasingly cross paths (perhaps in school hallways) formally and informally. If not already doing so, SL researchers should attend prevention conferences and read prevention publications. The opportunities for cross-fertilization seem strong. Of course, there will be growing pains as it will require learning about theories and approaches from related fields relevant to SL. SL researchers, particularly those at state and land grant universities, might also consider teaming with extension and outreach professionals to aid in the understanding of community contexts and ecologies, as well as to deliver and implement SL programs. SL researchers should also avail themselves of on campus experts who can help provide cross-disciplinary understanding/training. University institutes, centers, and consortia can also assist in harnessing multidisciplinary connections. By attending and presenting findings from SL studies at conferences both within and outside the discipline, SL researchers can also expand their range of disciplinary partners.

Both SL and PS must work mightily to align most appropriately and helpfully with communities. Clearly, PS and SL researchers aim to meet the needs and challenges of all their stakeholders. SL faculty face a number of constraints (e.g., their community based connections are often course-based, lack of external or internal funding to support their engagement) in developing long-lasting and sustainable partnerships that their PS colleagues often do not face. Thankfully, there are a number of good resources available to assist SL researchers in increasing their ties to communities (see for example Cushman, 2002; Jacoby & Associates, 2003; Lerner & Simon, 1998; Strand, et al., 2003). PS and SL research both value community involvement and community influence, although SL researchers are more likely to use egalitarian, responsibility sharing methods in their partnering efforts. SL researchers, relative to their PS peers, are much more likely to view community members as co-constructors of the effort, experts in their own right, and equal partners. Both PS and SL agree that the impact and sustainability of interventions meant to affect youth are enriched by both academic and community theories. In PS, collaborations appear to grow out of academic-instigated, theoretically driven interests, while in SL the community need is more likely to spur the collaboration. PS researchers have been quite successful in obtaining external funds to develop and sustain their intervention programs in communities. To date, SL researchers have not been as successful in finding and securing this kind of grant funding, and as a result it remains difficult to assess SL's impact on communities (Holland, 2001). SL researchers should pursue grants to develop and test sustained community relationships in a much more assertive manner. With respect to developing and sustaining deep and meaningful relationships with communities, ultimately researchers and community members must balance and integrate service and science goals (Schensul, 1999).

Conclusion

While much of this paper has presupposed that SL should learn from PS, it is also true that PS can learn from SL. SL researchers seem to look at themselves and ask a number of soul searing questions (e.g., How am I fostering social justice? How are my students viewing the communities within which they are

working?) that PS seems not to recognize, chooses to ignore, or leaves for others to debate (e.g., medical ethicists). While PS and SL share overlap in Butin's (2003) technical and cultural domains of inquiry and understanding, SL researchers are more likely to grapple with the political and post-culturalistic perspectives as well. Perhaps PS should begin to grapple with some of these weighty questions.

SL has had a hard time assessing community impact, something that PS has accomplished more readily. However, SL faces structural and limiting conditions that make it difficult to assess anything other than student impact (Butin, 2003). SL might make better research strides if it were more prevalently situated in departments and supported at key levels of the higher education enterprise. Moreover, PS is significantly supported by governmental and private funding agencies. In other words, it appears that SL and PS play on different fields in the world of academia. For SL, this becomes a bit of a "chicken and egg" story. To be taken more seriously within higher education and extramural funding sources, the scientific merits of SL research must improve. However, to improve the scientific merit of SL research additional internal and external support would be helpful. PS may provide some insights on how to proceed for those looking to push the rigor of SL research.

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