Article

Evaluation & the Health Professions
00(0) 1-12

DOI: 10.1177/0163278713488117
ehp.sagepub.com

Generalizing the Findings From Group Dynamics–Based Physical Activity Research to Practice Settings: What Do We know?

Samantha M. Harden[1], Shauna M. Burke[2], Amanda M. Haile[1], and Paul A. Estabrooks[1]

Abstract

The general purpose of this secondary analysis of a prior systematic review was to determine the degree to which group dynamics–based physical activity interventions align with research processes and outcomes that are more likely to facilitate the translation of research into practice. To accomplish this, a systematic search was conducted within Science Citation Index Expanded, Social Sciences Citation Index, Arts and Humanities Citation Index, and MEDLINE databases to identify articles published prior to 2010 that used at least one group dynamics–based strategy (e.g., group interaction, group goal setting) in physical activity promotion. These 17

[1] Virginia Tech, Human Nutrition, Foods, and Exercise, Blacksburg, VA, USA
[2] University of Western Ontario, School of Health Studies, London, Ontario, Canada

Corresponding Author:
Samantha M. Harden, Virginia Tech, Human Nutrition, Foods, and Exercise, Blacksburg, VA, USA.
Email: harden.samantha@vt.edu

intervention studies were identified and coded based on the reach, effectiveness, adoption, implementation, maintenance framework and Pragmatic–Explanatory Continuum Indicator Summary (for trial design characteristics). Reporting was infrequent for external validity factors (i.e., representativeness, adoption, cost, maintenance) but more frequent for internal validity factors (e.g., inclusion criteria). Intervention costs were not reported. Studies were more likely to be pragmatic (i.e., designed to determine the effects of an intervention under the usual conditions in which it will be applied) in areas of participant compliance and practitioner adherence and explanatory (i.e., designed to determine the effects of an intervention under ideal conditions) and in areas of practitioner expertise and flexibility of intervention protocol. While a number of these interventions were tested in more pragmatic settings, external validity factors were still underreported.

Keywords
physical activity, evaluation, group dynamics

Introduction

The wealth of knowledge related to the benefits of physical activity across populations and the life span continues to be the basis for a goal to translate evidence-based interventions that can promote and sustain physical activity into practice (U.S. Department of Health and Human Services, Healthy People 2020, 2011). In particular, with a high amount of consistency, group dynamics–based interventions have been used as an evidence-based method to increase physical activity (Burke, Carron, Eys, & Estabrooks, 2006; Estabrooks, Harden, & Burke, 2012). Relative to interventions that are delivered to an aggregate of people (e.g., aerobics or health education classes), group dynamics–based interventions include components that go beyond simple delivery of information to a group of people and use strategies and principles (e.g., group goal setting, interaction, friendly competition) that engage the group members and leaders as motivational tools (Carron & Spink, 1993). Group dynamics–based interventions have successfully increased physical activity in younger and older adults (Carron & Spink, 1993; Hughes et al., 2004), in healthy adults and those with chronic diseases (Dishman, DeJoy, Wilson, & Vandenberg, 2009; Focht, Brawley, Rejeski, & Ambrosius, 2004), across randomized controlled trials and quasi experiments (Cramp & Brawley, 2006; Kim et al., 2008), and

employing different group dynamics strategies and varying amounts of contact (e.g., weekly meetings focusing on group interaction; monthly meetings focusing on group goals; Estabrooks et al., 2012). Despite this evidence, there has been no summary of the literature that addresses the degree to which group dynamics–based physical activity interventions have been, or have the potential to be, translated into regular practice.

To address this gap in the literature, this brief report examines the degree to which group dynamics–based interventions have reported on factors and used study designs that could increase the likelihood of translation into practice. Specifically, a secondary analysis of a recent systematic review of group dynamics–based physical activity interventions was completed to determine the degree to which studies (a) reported on aspects of Glasgow, Vogt, and Boles' (1999) RE-AIM Framework (reach, effectiveness, adoption, implementation, maintenance) and (b) aligned with Thorpe and colleagues' (2009) Pragmatic–Explanatory Continuum Indicator Summary (PRECIS) method of documenting trial design characteristics. The RE-AIM framework (see Table 1 for descriptors) was developed to provide a balanced focus on internal and external validity outcomes, while also promoting transparent reporting across individual and organizational level outcomes important for research to practice translation (Glasgow, Vogt, & Boles, 1999). PRECIS was developed to allow for a more nuanced evaluation of trial characteristics that are thought to improve the likelihood of the translation of knowledge from research to practice. PRECIS proposes that the characteristics of a given trial can be either pragmatic (i.e., aspects of a trial reflect a typical practice context) or explanatory (i.e., alternative contextual explanations are eliminated through tight control), or fall on a continuum between the two.

In this way, RE-AIM and PRECIS are valuable approaches to understanding the potential for group dynamics–based physical activity interventions to be translated into practice. Our primary objectives were to determine where on the continuum of pragmatic and explanatory the studies on group dynamics–based physical activity interventions were positioned and the degree to which the study authors reported on RE-AIM dimensions—with a goal to provide evidence for the potential for these interventions to be translated into practice.

Method

Search terms were identified that aligned with group dynamics–based interventions and included a range of group environment (distinctiveness,

Table 1. RE-AIM Dimensions and PRECIS Indicators Reported in Studies.

RE-AIM dimension	%	PRECIS indicator	*M* (*SD*)
Reach			
Method to identify target population	100.0	Eligibility criteria	1.95 (1.73)
Inclusion criteria	70.6		
Exclusion criteria	70.6		
Participation rate	41.2		
Representativeness (gender, age, health status)	17.6		
Average reach components recorded	60.0		
Effectiveness			
Measures/results for ≥1 month	100.0	Primary trial outcome	1.95 (1.36)
Intent to treat	44.0	Primary analysis	2.16 (1.42)
Quality of life	17.6		
Percentage attrition	82.3		
Average effectiveness components recorded	60.9		
Adoption			
Description of intervention location	76.4	Practitioner expertise (experimental)	2.74 (1.05)
Inclusion of setting	17.6	Practitioner expertise (comparison)	2.92 (0.90)
Exclusion of setting	0.0		
Description of staff	88.2		
Level of expertise	94.1		
Adoption rate	23.1		
Average adoption components reported	49.9		
Implementation			
Intervention type and intensity	74.5	Flexibility of the experimental intervention	2.71 (1.26)
Extent protocol delivered as intended	41.2	Flexibility of the comparison intervention	2.46 (1.76)
Measures of cost	0.0	Participant compliance	1.20 (1.47)
Average implementation components reported	38.6	Practitioner adherence to study protocol	1.05 (1.60)
Maintenance			
Assess outcomes ≥6 months	47.0	Follow-up intensity	1.10 (1.48)

(continued)

Table 1. (continued)

RE-AIM dimension	%	PRECIS indicator	*M* (*SD*)
Reported on whether program is still in place	28.0		
Measures of cost of maintenance	0.0		
Average maintenance components reported	37.5		

Note. $N = 17$.
RE-AIM = reach, effectiveness, adoption, implementation, maintenance; PRECIS = Pragmatic–Explanatory Continuum Indicator Summary.

size), process (group goals, cooperation, competition, communication), structure (status, roles, norms), and cohesion indicators (Carron & Spink, 1993; see Estabrooks et al., 2012 for full review details). Each group dynamics–based search term was paired with physical activity, exercise, fitness, and adherence. Experimental and quasi-experimental (both with and without a control group) studies that focused on adults (i.e., >17 years old) were eligible for review. Potentially eligible articles ($n = 330$) from the Science Citation Index Expanded, Social Sciences Citation Index, Arts and Humanities Citation Index, and MEDLINE databases were reviewed and an initial 246 articles were eliminated for not meeting the inclusion criteria. Eighty-four articles were read in full and assessed for eligibility. Sixty-four of those were also removed from the review, as they did not include group dynamics principles ($n = 33$), had no outcome of interest ($n = 16$), were not intervention studies ($n = 7$), or were not accessible in English ($n = 8$). This left 20 articles that represented 17 independent interventions (Estabrooks et al., 2012).

Data Extraction and Synthesis

RE-AIM. Each study was scored ($1 = yes$, $0 = no$) across 21 items related to the reporting of each of the RE-AIM components (Akers, Estabrooks, & Davy, 2010; Allen, Zellner, Motley, & Estabrooks, 2011; Dzewaltowski, Estabrooks, Klesges, Bull, & Glasgow, 2004). The items that corresponded with each dimension of RE-AIM can be seen in Table 1. Two members of the research team independently coded each article based on the dimension descriptions below. Every article coding was then compared in the presence of the third researcher. On the rare occasion (<10%) that a discrepancy

between coders occurred, the coders examined and discussed the article in detail until a consensus was reached.

PRECIS. To report on the 10 specific PRECIS domains that represent trial design characteristics, we used the recommended methodology that includes the representation of each of the 10 domains as a spoke on a wheel (Glasgow et al., 2012; Thorpe et al., 2009; Sackett, D. PrECIsPragmatic-Explanatory Continuum Indicators: Spokes; see Table 1). Specifically, each domain was measured on a 5-point scale where 0 was completely pragmatic (on the outside of the wheel) and 4 was completely explanatory (closest to the center of the wheel). The tighter the web on the wheel, the more explanatory the intervention; the wider the web, the more pragmatic the intervention. For a methodological example, participant eligibility was designed to determine the representativeness and flexibility in the sample, where 0 represented *no exclusion criteria* and 4 represented *participant run-in periods*. Three of the authors (S.B., P.E., S.H.) independently coded nine articles and met to ensure consistency in ratings across the 10 PRECIS domains. Coders reached consensus on each area of discrepancy by referring to the definitions provided by Thorpe and colleagues (2009). Once greater than 90% agreement between authors occurred, two randomly assigned authors coded each of the remaining articles.

Results

Of the five dimensions of RE-AIM, effectiveness and reach indictors were most frequently reported at 60.0% and 60.9%, respectively (see Table 1). Adoption, implementation, and maintenance followed; 49.9% of the articles reported on adoption components, 38.6% reported on implementation, and 37.5% reported on maintenance. There were components within each dimension that were consistently reported (i.e., methods to identify target population [reach], measures of at least one follow-up [efficacy/effectiveness]) and some components that were often reported (e.g., description of staff delivering intervention [adoption]). None of the studies reported on the exclusion criteria that may have applied to the delivery setting (e.g., space allocation or geographic location [adoption]). Interestingly, no study reported on measures of costs related to implementation or maintenance.

Across the PRECIS continuum for each study, the level of training among the reported practitioners ranged from highly trained/expert staff to moderate training with a range in staff expertise (see Figure 1 and Table 1). The comparison conditions also varied with regard to the level

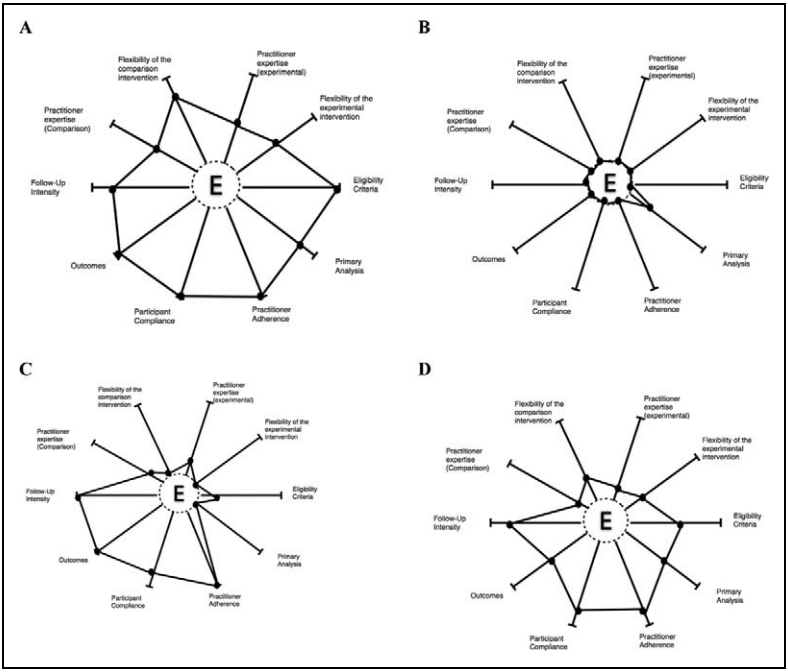

Figure 1. Exemplar and average PRECIS ratings. A. PRECIS summary of a randomized control trial by Estabrooks & Carron, 1999. B. PRECIS summary of a randomized control trial by Annesi (1999). C. Exemplar of a mixed (pragmatic and explanatory) PRECIS summary (Ard et al., 2008). D. PRECIS summary of the average across all 17 group dynamics–based articles. "E" represents the "explanatory" end of the pragmatic–explanatory continuum. PRECIS = Pragmatic–Explanatory Continuum Indicator Summary.

of practitioner expertise reported; examples of staff expertise were trained research assistants (e.g., Leermakers, Perri, Shigaki, & Fuller, 1999), group exercise leaders (e.g., Cramp & Brawley, 2006), and on-site coordinators (e.g., Dishman et al., 2009).

Of the 17 studies, 12 did not report any assessment of the degree to which practitioners delivered the program as intended. Three studies did, however, report close monitoring and attention to delivering the program with high fidelity (Annesi, 1999; Perry, Rosenfeld, Bennett, & Potempa, 2007; Rejeski et al., 2002, 2003). Of the 17 studies, 8 did not report any measurement of participant compliance. Of those studies that did report measures of patient compliance, the content ranged from reporting strategies to measure

and increase compliance (e.g., Amundson et al., 2009) to incorporating close researcher monitoring and strategies to ensure participant adherence.

Eligibility criteria for participants in the 17 studies ranged from completely pragmatic (e.g., Estabrooks, Bradshaw, Dzewaltowski, & Smith-Ray, 2008) to completely explanatory (Hughes et al., 2004). Of the 17 studies, 6 demonstrated a completely explanatory approach, 7 fell toward the middle of the continuum between explanatory and pragmatic, and the remaining 7 were primarily pragmatic. For follow-up procedures, 9 of the 17 studies had no additional visits outside of the usual clinic follow-up. Two studies included more frequent visits, data collection, and follow-up time points overall (Annesi, 1999; Rejeski et al., 2002, 2003). Seven total studies developed rigid protocols with no deviations in regard to their experimental interventions. Four studies were less strict about protocol and allowed some adaptations to guidelines throughout the intervention (Amundson et al., 2009; Estabrooks et al., 2008; Estabrooks & Carron, 1999; Wilson et al., 2010). One study (Green, Cheadle, Pellegrini, & Harris, 2007) was based on intervention principles rather than specific strategies, and therefore, allowed for high adaptation.

Of the 17 studies, 7 did not specify or include a comparison group, while 6 contained comparison groups that were placebo controlled with no flexibility. Five studies reported primary outcomes that were objectively measured under usual conditions and five studies contained primary trial outcomes that were largely objective and readily measured (Dishman et al., 2009; Estabrooks, Fox, Doerksen, Bradshaw, & King, 2005; Green et al., 2007; Perry et al., 2007; Wilson et al., 2010). Three studies reported outcomes that were directly related to the independent variable (Annesi, 1999; Hughes et al., 2004; Rejeski et al., 2002, 2003). Finally, four studies fell within the continuum of the examples listed above (Cramp & Brawley, 2006, 2009; Focht et al., 2004; Kim et al., 2008; Leermakers et al., 1999).

Discussion

We are the first, to our knowledge, to systematically review and examine the degree to which studies within a body of literature, specifically the group dynamics–based literature, have (a) been designed to support translation into practice and (b) reported on key translation-related external validity factors. When compared to other reviews of literature that have examined the external validity of behavioral interventions (Akers et al., 2010; Allen et al., 2011; Dzewaltowski et al., 2004), we found that the physical activity group dynamics–based research ranged across the PRECIS

continuum and was more likely to report on certain external validity factors (i.e., adoption and maintenance). However, the current findings were similar to those reported in other behavioral intervention research in regard to the lack of reporting of representativeness of recruited populations and settings. For example, while all studies in the current review reported on sample size, few rigorously described the representativeness of study participants, settings, and staff. This makes it difficult to draw conclusions about the differences between individuals who participate and those who decline participation (Akers et al., 2010; Dzewaltowski et al., 2004).

Our review also provides validation for the PRECIS model in that the intervention trials included were neither completely explanatory nor pragmatic, but reflected a range across the 10 domains (Thorpe et al., 2009). A previous PRECIS review (Glasgow et al., 2012) found that weight loss trials for obese participants with comorbidities were more pragmatic in terms of comparison condition flexibility, practitioner expertise, and primary trial outcome, while follow-up intensity, practitioner adherence, and participant compliance were more explanatory. This contrasts the group dynamics–based physical activity promotion literature in which practitioner adherence, participant compliance, and follow-up intensity were more pragmatic, whereas practitioner expertise and flexibility of the comparison and intervention conditions were more explanatory.

Our review also provides evidence that can be translated into regular practice by outlining clear recommendations, which can ultimately improve the state of behavioral science. We recommend that researchers (1) include information on the representativeness of participants, intervention staff, and intervention settings to allow practitioners to determine if the research is relevant to his or her skill level, organization, and clientele; (2) report on the cost of intervention materials and delineate start-up and ongoing costs to allow practice professionals to ensure they have adequate resources to implement the intervention; (3) should, once the evidence-based intervention has demonstrated consistent effectiveness, structure study designs to more closely reflect typical community and clinical contexts, missions, and resources.

Conclusion

Seventeen studies that utilized group dynamics strategies to increase physical activity behaviors were included in the current review. As hypothesized, the level of pragmatism varied across this body of literature. The results presented in this study support the conclusion that more rigorous

reporting on all dimensions of RE-AIM, specifically on costs, is needed to speed the rate of translation. Our findings also indicate that interventions can combine both tight/explanatory (run-in periods) domains as well as pragmatic (broad inclusion criteria) domains and still be effective and ready to translate into practice.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

Akers, J., Estabrooks, P. A., & Davy, B. M. (2010). Translational research: Bridging the gap between long-term weight loss maintenance research and practice. *Journal of the American Dietetic Association*, *110*, 1511–1522.

Allen, K. C., Zellner, J. M., Motley, M., & Estabrooks, P. A. (2011). Understanding the internal and external validity of health literacy interventions: A systematic literature review using the RE-AIM Framework. *Journal of Health Communication: International Perspectives*, *16*, 55–72.

Amundson, H. A., Butcher, M. K., Goddess, D., Hall, T. O., Harwell, T. S., Helgesson, S. D., & Vanerwood, K. K. (2009). Translating the diabetes prevention program into practice in the general community: Findings from the Montana Cardiovascular Disease and Diabetes Prevention Program. *Diabetes Education, 35, 209–210*, *213–204*, 216–220.

Annesi, J. J. (1999). Effects of minimal group promotion on cohesion and exercise adherence. *Small Group Research*, *30*, 542–557.

Ard, J. D., Kumanyika, S., Stevens, V. J., Vollmer, W. M., Samuel-Hodge, C., Kennedy, B., . . . Svetkey, L. P. (2008). Effect of group racial composition on weight loss in African Americans. *Obesity (Silver Spring), 16*, 306–310.

Burke, S. M., Carron, A. V., Eys, M. A., & Estabrooks, P. A. (2006). Group versus individual approach? A metaanalysis of the effectiveness of interventions to promote physical activity. *Sport and Exercise Psychology Review*, *2*, 19–35.

Carron, A. V., & Spink, K. S. (1993). Team building in an exercise setting. *The Sport Psychologist*, *7*, 8–18.

Cramp, A. G., & Brawley, L. R. (2006). Moms in motion: A group-mediated cognitive behavioral physical activity intervention. *International Journal of Behavioral Nutrition and Physical Activity*, *3*, 23.

Cramp, A. G., & Brawley, L. R. (2009). Sustaining self-regulatory efficacy and psychological outcome expectations for post-natal exercise: Effects of group-mediated cognitive behavioral intervention. *British Journal of Health Psychology*, *14*, 595–611.

Dishman, R. K., DeJoy, D. M., Wilson, M. G., & Vandenberg, R. J. (2009). Move to improve: A randomized workplace trial to increase physical activity. *American Journal of Preventative Medicine*, *36*, 133–141.

Dzewaltowski, D. A., Estabrooks, P. A., Klesges, L. M., Bull, S., & Glasgow, R. E. (2004). Behavior change intervention research in community settings: How generalizable are the results? *Health Promotion International*, *19*, 235–245.

Estabrooks, P. A., Bradshaw, M., Dzewaltowski, D. A., & Smith-Ray, R. L. (2008). Determining the impact of Walk Kansas: Applying a team-building approach to community physical activity promotion. *Annals of Behavioral Medicine*, *36*, 1–12.

Estabrooks, P. A., & Carron, A. V. (1999). Group cohesion in older adult exercisers: Prediction and intervention effects. *Journal of Behavioral Medicine*, *22*, 575–588.

Estabrooks, P. A., Fox, E. H., Doerksen, S. E., Bradshaw, M. H., & King, A. C. (2005). Participatory research to promote physical activity at congregate-meal sites. *Journal of Aging and Physical Activity*, *13*, 121–144.

Estabrooks, P. A., Harden, S. M., & Burke, S. M. (2012). Group dynamics in physical activity interventions: What works? *Social and Personality Psychology Compass*, *6*, 18–40.

Focht, B. C., Brawley, L. R., Rejeski, W. J., & Ambrosias, W. T. (2004). Group-mediated activity counseling and traditional exercise therapy programs: Effects on health-related quality of life among older adults in cardiac rehabilitation. *Annals of Behavioral Medicine*, *28*, 52–61.

Glasgow, R. E., Gaglio, B., Bennett, G., Jerome, G. J., Yeh, H. C., Sarwer, D. B., & Wells, B. (2012). Applying the PRECIS criteria to describe three effectiveness trials of weight loss in obese patients with comorbid conditions. *Health Services Research*, *47*, 1051–1067.

Glasgow, R. E., Vogt, T. M., & Boles, S. M. (1999). Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *American Journal of Public Health*, *189*, 1322–1327.

Green, B. B., Cheadle, A., Pellegrini, A. S., & Harris, J. R. (2007). Active for life: A work-based physical activity program. *Preventing Chronic Disease*, *4*, 1–7.

Hughes, S. L., Seymour, R. B., Campbell, R., Pollak, N., Huber, G., & Sharma, L. (2004). Impact of the fit and strong intervention on older adults with osteoarthritis. *The Gerontologist*, *4*, 217–228.

Kim, K. H., Linnan, L., Campbell, M. C., Brooks, C., Koenig, H. G., & Wiesen, C. (2008). The WORD (Wholeness, Oneness, Righteousness, Deliverance): A faith-

based weight-loss program utilizing a community-based participatory research approach. *Health Education and Behavior*, *35*, 634–650.

Leermakers, E. A., Perri, M. G., Shigaki, C. L., & Fuller, P. R. (1999). Effects of exercise-focused versus weight-focused maintenance programs on the management of obesity. *Addictive Behaviors*, *24*, 219–227.

Perry, C. K., Rosenfeld, A. G., Bennett, J. A., & Potempa, K. (2007). Heart-to-Heart: Promoting walking in rural women through motivational interviewing and group support. *Journal of Cardiovascular Nursing*, *22*, 304–312.

Rejeski, W. J., Brawley, L. R., Ambrosius, W. T., Brubaker, P. H., Focht, B. C., Foy, C. G., & Fox, L. D. (2003). Older adults with chronic disease: Benefits of group-mediated counseling in the promotion of physically active lifestyles. *Health Psychology*, *22*, 414–423.

Rejeski, W. J., Foy, C. G., Brawley, L. R., Brubaker, P. H., Focht, B. C., Norris, J. L., & Smith, M. L. (2002). Older adults in cardiac rehabilitation: A new strategy for enhancing physical function. *Medicine and Science in Sports and Exercise*, *34*, 1705–1713.

Sackett, D. PrECIsPragmatic-Explanatory Continuum Indicators: Spokes. Presentation: http://ww.support-collaboration.org/precis.pdf

Thorpe, K. E., Merrick, Z., Oxmn, A. D., Treweek, S., Furberg, C. D., Altman, D. G., & Chalkidou, K. (2009). A pragmatic–explanatory continuum indicator summary (PRECIS): A tool to help trial designers. *Journal of Clinical Epidemiology*, *180*, E47–E57.

U.S. Department of Health and Human Services, Healthy People 2020. (2011). Retrieved from http://www.healthypeople.gov/2020/default.aspx

Wilson, M. G., Basta, T. B., Bynum, B. H., DeJoy, D. M., Vandenberg, R. J., & Dishman, R. K. (2010). Do intervention fidelity and dose influence outcomes? Results from the Move to Improve worksite physical activity program. *Health Education Research*, *25*, 294–305.