

# The Behavior-Image Model: a paradigm for integrating prevention and health promotion in brief interventions

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## Abstract

**This paper describes the Behavior-Image Model (BIM), an emerging and innovative paradigm for planning brief interventions for adolescents that fuse the prevention of harmful behaviors with the promotion of healthy habits. We discuss the components of the BIM as a new paradigm for creating multiple behavior health interventions, as well as the empirical and conceptual underpinnings of the model, and present Project Sport as an illustration of how the BIM may be applied to construct a brief multi-behavior intervention. The BIM posits that selected salient images of others and ourselves may be used to cast gain- and loss-framed messages coupling and motivating health-promoting and health-risk behaviors within single interventions. This content in turn activates prototypes and future self-images through the processes of social and self-comparison, leading to improvements in risk and protective factors and subsequent change in targeted health-promoting and health-risk behaviors. Recommendations are offered for conducting future research integrating health-risk and health-promoting behaviors in both brief and non-brief interventions for adolescents and adults.**

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## Introduction

National surveys of American youth drug consumption show that alcohol is the most widely used drug, with Youth Risk Behavior Surveillance System (YRBSS) data for 2003 indicating that 75% had at least one drink of alcohol in their lifetime, nearly half (44.9%) had one or more drinks of alcohol in the last 30 days and almost a third (28.3%) had five or more drinks on one or more occasions in the past 30 days, i.e. episodic heavy drinking [1]. Meanwhile, the prevalence of cigarette use among adolescents is second only to alcohol consumption, with YRBSS data showing that in the United States, 58.4% of high school students have tried cigarettes, while 15.8% of students reported smoking at least one cigarette every day in the past 30 days, 21.9% reported smoking cigarettes on at least one of the past 30 days and 9.7% reported smoking cigarettes on at least 20 of the past 30 days [1]. Further, marijuana continues to be the most widely used illicit drug among adolescents in the majority of Western countries [2–5]. YRBSS data, for example, indicate that 40.2% of high school students tried marijuana during their lifetime, and 22.4% of students had used marijuana at least once during the 30 days prior to the study [1]. Substance use among youth has been found to produce a number of harmful effects ranging from risk of injury, impaired driving, violence and unprotected sexual intercourse for alcohol use [6–9] to increased number and severity of respiratory illnesses, decreased physical fitness, unfavorable lipid profile, development of asthma, potential retardation in the rate of lung growth and maximum lung function for cigarette smoking [10, 11] and increased risk for leaving school for marijuana use [12].

Research on brief motivational interventions for preventing substance use problems has been widely reported in the literature [13–15]. Both the World Health Organization [16] and the US Institute of Medicine [17] have stated that brief interventions are an efficacious strategy. A number of meta-analyses and research reviews have examined the effects of brief interventions, and have concluded that they are low cost and effective in reducing drug and alcohol consumption among adults [13, 15, 18–20]. While there is no single agreed upon definition, or even type, of brief intervention, Werch *et al.* [21] recently defined brief intervention as any intervention that is purposely limited in the number and length of contacts, between a health professional and one or more individuals using personal or media channels of communication, which provides personalized information designed to increase motivation to improve health-related behavior. Brief interventions are therefore specifically designed to involve the least amount of contact and effort necessary to obtain and sustain significant impacts on health and health behaviors.

To date, relatively few brief motivational interventions have been developed for adolescents [22]. In addition, studies of brief interventions have been criticized for their limited focus primarily on substance abuse, resulting in calls for broadening interventions to address other health behaviors [23]. Moreover, interventions limited to addressing risk behaviors like substance use may be perceived by adolescents as more negative and less interesting than those targeting health-promoting behaviors, and therefore may suffer from lack of interest and participation. Needed are models for developing brief interventions that integrate health promotion and prevention messages aimed at enhancing youth development and achieving salient goals of adolescents.

This paper describes an innovative model for planning brief interventions for preventing harmful behaviors such as alcohol, tobacco and drug misuse, by promoting healthy habits like exercise, proper nutrition and appropriate sleep among adolescents. First, we discuss conceptual and empirical literature underpinning the Behavior-Image Model (BIM). Second, the BIM is described as an emerging paradigm for creating multiple behavior health

interventions. The BIM is unique in its use of image-based gain- and loss-framed messages posited to activate prototypes and future self-images coupling and motivating multiple behavior change in brief interventions. Project Sport is presented as an illustration of how the BIM may be applied in creating brief, multiple behavior health interventions. We conclude with a set of recommendations regarding future research integrating prevention and health promotion.

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### Why integrate health-promoting and health-risk behaviors?

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Health behaviors that contribute to the leading causes of morbidity and mortality are often established during youth, interrelated and preventable [24]. In addition, many adolescent health behaviors share common determinants [25–28], suggesting that interventions addressing multiple health behaviors simultaneously may be a successful strategy. As some have recently described, programs that promote healthy adolescent development can help enhance a range of health behaviors among youth [29, 30] and that multiple behavior interventions may have a greater impact on public health than programs focused on single behaviors [31]. Others have recommended the integration of prevention and health promotion models [32–34] and the emphasis of health enhancement for preventing problems [35, 36]. Interventions that influence a number of health behaviors have the potential added advantage of being more cost-effective and easily adopted by schools, health clinics and communities than those addressing single behaviors.

A recent study of the prevalence of four major behavioral risk factors among adults in the United States [37], including problematic alcohol consumption, physical inactivity, smoking and overweight, found that 33% of the population had one risk factor, 45% had two, 12% had three, 2% had all four and 7% had none. While only four health behaviors were examined in this study, the results indicate that the majority of the US adult population experiences multiple risk factors. Meanwhile,

adolescence is a developmental period in which multiple behavioral risk factors are often established and contribute to the leading causes of morbidity and mortality among youth and adults. For example, the Centers for Disease Control and Prevention reports that numerous high school students engage in risk behaviors related to the primary causes of death among 10- to 24-year olds, including drinking alcohol, riding with a driver who had been drinking and using marijuana, as well as behaviors related to the major causes of death among those older than 24 years, including smoking cigarettes, not engaging in sufficient physical activity, not eating sufficient daily servings of fruits and vegetables and being overweight [38]. In summary, epidemiological data on health risks indicate the critical need for effective interventions which address multiple health-related behaviors simultaneously, for adults and particularly for adolescents.

Understanding how to motivate and change multiple behaviors is thought to be critical for developing effective interventions [31]. The Behavior Change Consortium, coordinated by the Office of Behavioral and Social Sciences Research and funded from 17 Offices and Institutes of the National Institutes of Health, was initiated to support a new generation of research on innovative strategies to modify health behavior, including multiple and interacting health risks that afflict the majority of the US citizens [39, 40]. Likewise, the Prescription for Health initiative was recently started to support research to test in part innovative interventions addressing multiple health-related behavior change [41]. At this time, however, little is known about how to most effectively develop interventions for impacting multiple behaviors [42], and few conceptual models exist to help plan these types of interventions.

Unfortunately, some research has indicated that multiple behavior-targeted programs may be less efficacious than those targeting single health behaviors [43, 44], raising concerns about indiscriminately bundling multiple health behaviors within single interventions. In a recent review of behavioral health change interventions, Goldstein *et al.* [45] concluded that large gaps exist in our knowl-

edge of how to develop efficacious health interventions that address multiple behaviors. Clearly new models are needed to help guide the development of multi-behavioral interventions, especially those which integrate health-enhancing and health-risk behaviors. Such innovative health interventions would provide a rare bridge for incorporating prevention, treatment and health promotion within single programs, and quite possibly enhance the translation of health behavior change research into practice and policy.

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### Message framing

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Prospect Theory states that information presented in terms of either positive gains (benefits) or negative losses (costs) influences behavioral decisions differentially [46, 47]. This is because decision making is believed to depend upon how choice-related information is presented or framed. Generally speaking, gain-framed messages are thought to be more effective for influencing decisions regarding behaviors with low-risk, certain outcomes, such as health-promoting and health-prevention behaviors [48, 49]. The underlying assumption of Prospect Theory is that people are risk seeking when they consider losses, but risk averse when they consider gains [48]. Past studies have supported gain-framed communications for influencing health-promoting and health-prevention behaviors such as exercise [50], sunscreen use [51], human immunodeficiency virus testing [49] and tobacco use avoidance and cessation [52].

The relationship between various health behaviors and message-framing effects has been found to be more complicated than originally proposed in Prospect Theory, due to contextual and individual variations [48, 53]. This has resulted in calls from some to employ both positive- and negative-framed messages in health communications so that they may be relevant and appealing for all targeted participants [53]. At least one study has shown that the use of dual framing can lessen framing effects [54]. Image-based strategies that have emphasized appearance enhancement benefits (gains) or costs

(losses) of health promotion behaviors have shown promise in a number of recent studies involving youth [55–58]. Meanwhile, using an image appeal linking a health promotion or prevention target behavior (e.g. increasing exercise or avoiding alcohol misuse) with a socially desirable image (e.g. active youth) is consistent with prior research findings on message framing and health communication [48]. Lacking are models illustrating how image can be used to combine both gain- and loss-framed messages to reduce message bias and how dual-framed messages could be used to integrate health-promoting and health-risk behaviors within single interventions.

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### The role of image in health behavior

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An increasing number of studies have pointed to image as an important motive in the onset and maintenance of substance abuse and other health behaviors among adolescents [59–61]. Similarly, self-presentation has been shown to be associated with a number of health behaviors [62–65], suggesting that concern over one's public image is an important factor in explaining certain health habits. The use of appealing images, including models and situations, has an empirical foundation in marketing communications and advertizing [66, 67] and a conceptual basis in Social Cognitive Theory [68]. Image appeals are thought to be expressed not only through visual means but also by prose and verbally as well [69], permitting a range of modes of communication to be used in portraying salient images. The advantage of targeting images is that multiple, co-varying behaviors can be addressed in a relatively efficient manner, making them ideal for developing brief interventions. For example, compared with typical health education programs that might address exercise and substance abuse in separate, lengthier interventions, the use of developmentally appropriate images of physically active and healthy adolescents can be used to address multiple behaviors (e.g. exercise, nutritious diet and substance use) within a single program theme.

Most of the research examining images has been limited to risk behaviors such as cigarette and

alcohol use [70]. Early work in the area of image and health behavior indicated that adolescents focused on images they had of the behavior and the type of person who engages in it, hoping to acquire the characteristics associated with the behavior or person [71, 72]. More recently, the prototype/willingness model proposed by Gibbons and Gerrard [73] indicated that images we have of others, or prototypes, have a significant influence on the risk behavior of adolescents. Activating existing social image prototypes/stereotypes, or creating new ones, regarding the personality characteristics of groups of people can significantly influence health behavior [74–76]. This influence has been shown to work through an interpersonal social comparison process in which young people compare themselves to the prototype [77]. Studies that have attempted to determine the image of the adolescent who avoids substance use have found that it is much harder to envision a non-user or to have a distinct image or prototype of a non-user [78, 79]. In addition, evidence indicates that unfavorable images consistently affect risk behavior [80] (F. X. Gibbons, M. L. Stock, M. Gerrard *et al.*, submitted), suggesting that negative images of those engaging in health-risk behaviors may successfully influence behaviors such as substance use.

More recently, research has supported the importance of addressing prototypes/stereotypes in predicting health-promoting behaviors such as exercise [81]. For example, individuals report multiple favorable impressions of those perceived as exercisers compared with non-exercisers, suggesting the latent motivating influence of the social image of being physically active [82, 83]. In addition, adolescents who prefer to be associated with an 'athletes' group were found to be significantly less likely to smoke cigarettes than those preferring other groups [84]. Unlike health-risk behaviors, gain-framed messages showing favorable images can be successfully employed to influence health-promoting habits [85]. Health-promoting behaviors such as physical activity and exercise have been identified as a useful point of entry for facilitating dialogue among adolescents about self-image and problem behavior

[86], while others have recommended research examining whether interventions for increasing positive health habits such as physical activity could be efficacious in reducing negative health behaviors [87]. Health communication researchers have suggested that program planners yoke the avoidance of negative behaviors (e.g. alcohol, cigarette and other drug consumption) to the promotion of salient productive behaviors (e.g. physical activity and sport participation), thereby more effectively decreasing the embeddedness of the negative behaviors [88]. How to use images to couple health-promoting and health-risk behaviors in single interventions, let alone brief interventions, has yet to be clearly articulated thus far.

A study by Ouellette *et al.* [85] showed that health images were important to increasing exercise behavior among college students, including both prototypes of exercisers and non-exercisers, as well as images of themselves in the future. Other research has indicated that images of future or possible self are important to predicting health behavior [89] as well as improved academic outcomes [90]. This research suggests that images other than prototypes identified in the prototype/willingness model may be important to shaping health and personal development behaviors. Unlike prototypes which are interpersonal, possible selves are intrapersonal and thought to operate through temporal self-comparison (e.g. Time 1–Time 2). In other words, comparison of current self with possible future desired self is thought to moderate the impact of image on behavior [91, 92]. The processes of social and self-comparison may together be key mechanisms of action explaining the efficacy of feedback-related interventions [93]. Lacking are paradigms illustrating how both prototype and future self-images may be activated or created to impact both health-promoting and health-risk behaviors simultaneously.

Emphasizing the selection of self-concordant goals that reflect one's desired image (i.e. a prototype or future self-image) has been shown to facilitate behavioral change [82], and may have greater appeal to adolescents than typical prevention and health promotion interventions with pre-

selected program goals. A major reason for failing at attaining personal goals is that they are adopted for external reasons instead of reflecting one's personal interests and values [94]. Research indicates that the source of a goal is associated with its successful achievement [95, 96]. Specifically, setting self-concordant goals, or those endorsed by the self, is believed to be significantly associated with goal progress [94, 97, 98]. Interventions which tap into commonly desired images of adolescents may result in more goal commitment and, subsequently, greater behavior change.

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### The Behavior-Image Model

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The BIM is a framework for planning multiple behavior, brief health interventions. Unlike prevention programs that tend to be risk-based emphasizing youth problems, the BIM proposes the development of health programs that emphasize normative youth development through integrating the promotion of positive goals (i.e. images) and health-enhancing behaviors, along with health-risk awareness. By emphasizing the promotion of assets, the BIM may result in interventions that have greater political, institutional and adolescent appeal than those emphasizing the limitations of youth [34]. Asset-based programs will be more attractive to many adolescents and youth organizations given their accent on positive, gain-framed messages, which stand in contrast to deficit-only programs emphasizing negative, loss-framed messages.

Supported by Prospect Theory and related literature on message framing discussed earlier [46–49], the BIM postulates that like health habits can be conceptualized as reinforcing each other toward achievement of greater or lesser health and personal improvement, while opposing health-risk and health-promoting behaviors can be viewed as countering each other. Specifically, the BIM suggests that health-promoting behaviors can be framed as leading to greater health/personal development (i.e. gains), while health-risk behaviors can be described as interfering with health enhancement and personal growth, as well as with obtaining health-promoting

habits (i.e. losses). In addition, health-risk behaviors can be further framed in terms of benefits through their avoidance, and subsequent achievement of health-promoting habits and greater health (i.e. gains). A unique aspect of BIM, therefore, is the use of both gain and loss messages to connect both like and opposing health behaviors simultaneously within one intervention.

The BIM is founded on the belief that to achieve optimal health and personal performance, as well as to prevent and mitigate declines in health status, multiple health-risk and health-promoting behaviors must be considered across the lifespan. Using the BIM, this is accomplished through the process of coupling pairs of divergent health-risk and health-promoting behaviors resulting in the construction of multiple behavior interventions. A behavior coupling is a conceptual, empirical or logical relationship drawn between two health behaviors, even if the behaviors are not directly or noticeably related. For example, a coupling of eating a balanced diet and alcohol use may not be immediately evident, but both can be paired when viewed from the perspective of human caloric consumption.

Among health-promoting habits, such as engaging in physical activity, eating a nutritious diet, managing stress, getting adequate sleep and practicing pro-social skills, the BIM proposes that coupled behaviors be presented as reinforcing and strengthening each other toward achieving optimal health and personal development goals. For example, physical activity can enhance one's quality sleep, while adequate sleep is important to maintaining and improving a person's physical fitness and performance. By the same token, the BIM suggests that health-risk behaviors, such as using alcohol, tobacco and other illegal drugs, violence and engaging in risky sexual habits, should also be coupled in health messages as reinforcing each other, but as interfering with achieving health and personal development goals. For example, alcohol misuse can increase the probability of one's engaging in violent behavior [99], and exposure to violence increases the chances of a person abusing alcohol [100].

Together, the coupling of both like and opposing health behaviors is critical to integrating prevention

and health promotion objectives and the development of holistic, multiple behavior interventions. Opposing behavior couplings are framed as a health-risk behavior counteracting or weakening the gains of a health-promoting behavior, leading to reductions in health and personal development. Inherent in all opposing behavior couplings is the importance of avoiding or limiting health-risk behaviors for achieving the paired health-enhancing behavior and maintaining optimal health. For example, the misuse of alcohol and drugs can have detrimental effects on one's ability to perform sports and engage in exercise, eventually resulting in reductions in physical fitness and cardiovascular health status [6]; thus, avoiding alcohol and drug misuse is important to achieving personal sport and exercise goals.

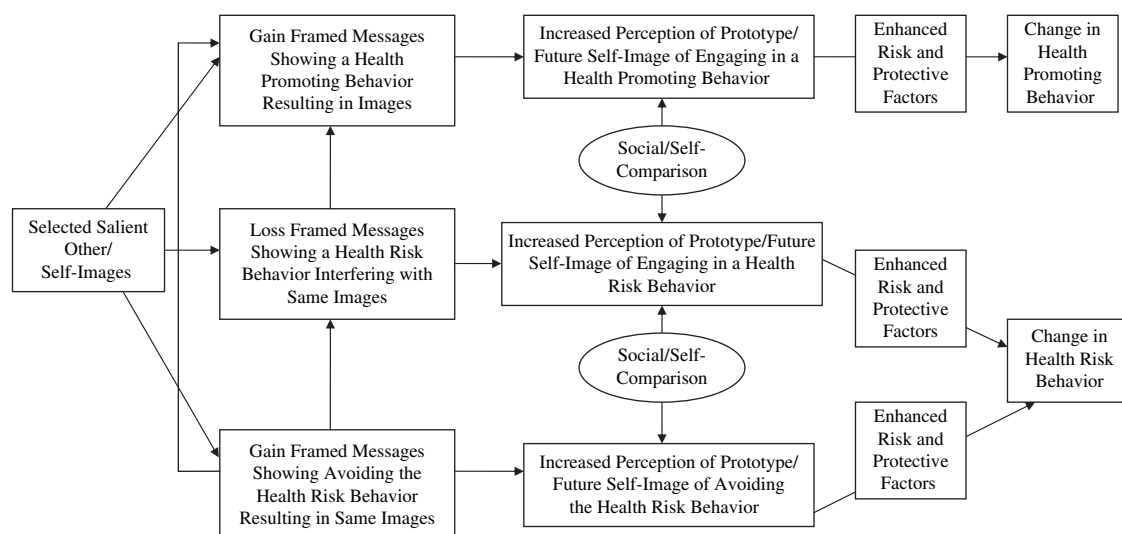
The challenge to bringing prevention and health promotion under one intervention is to articulate the important relationships between incongruous health behaviors (i.e. those that promote health versus those that harm health), as well as those that are alike, and describe how these relationships can lead to either increased or reduced personal enhancement, health, performance and quality of life goals. To review, the BIM proposes the use of both gain- and loss-framed messages to couple multiple behaviors in health interventions, with gain-framed messages illustrating how pairs of health-promoting habits reinforce each other toward greater personal development and health, and loss-framed messages showing how health-risk habits reinforce each other toward harming health and interfering with achievement of personal goals and health-promoting habits. It's the later coupling of health-risk and health-promoting behaviors that permits the unique integration and simultaneous targeting of prevention and health promotion goals within one intervention.

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### Key components of the BIM

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Figure 1 illustrates the key components of the BIM and their relationship to each other. The primary elements of the BIM are as follows: (i) 'Salient other and self-images' of adolescents are selected,



**Fig. 1.** The BIM.

which serve as the primary content for coupling and motivating multiple behavior targets; (ii) The same images are used to construct both ‘gain- and loss-framed intervention messages’ illustrating outcomes resulting from engaging in or avoiding targeted health-promoting and health-risk behaviors among peers and self; (iii) These messages are hypothesized to result in ‘increased perception of prototypes and self-images’ associated with engaging in or avoiding targeted health-promoting and health-risk behaviors among others and oneself; (iv) ‘Social and self-comparison processes’ serve as the mechanism by which gain- and loss-framed messages influence prototypes and future self-images; (v) Change in prototypes/self-images enhance ‘risk and protective factors’ associated with targeted health-promoting and health-risk behaviors and (vi) Improvements in risk and protective factors result in change in targeted health-promoting and health-risk behaviors.

A central component of the BIM is its unique targeting of salient images as critical to both integrating and motivating simultaneous multiple behavior change through activation of existing or creation of new prototypes and future self-images. The critical importance of image is based in part on the prototype/willingness model [73] and related

research on stereotypes/prototypes [74–76], as well as empirical evidence of the impact of future image on health behavior [85, 89, 91, 92]. Previous studies have supported the role of self-presentational and image-related concerns and aspirations in influencing the health and well-being of adolescents and adults alike, including those emphasizing physical appearance, character, mental health, economic well-being and normative behavior [101–103].

As shown in Fig. 1, the BIM begins with the identification of salient images of adolescents, as viewed in others (i.e. peers) or oneself (i.e. self-images). These social and personal images serve as the basis for creating both gain- and loss-framed messages, linking targeted health-promoting and health-risk behaviors within a single health intervention. Specifically, salient images are first used to cast gain-framed messages showing how engaging in one or more health-promoting behaviors advances the attainment of positive image goals. Leading with gain-framed messages addressing positive images highlights the asset-based or youth development approach used by the BIM. These same images are then used to create loss-framed messages showing how engaging in one or more health-risk behaviors interferes not only with the achievement of positive

image outcomes but also, as shown by the vertical arrow, with successfully engaging in the targeted health-promoting behaviors. Lastly, gain-framed messages are used to illustrate how avoidance of the risk behavior leads to positive image attainment, as well as achievement of targeted health-promoting behavior.

In the BIM, salient images are used as the basis for developing messages illustrating the benefits resulting from practicing health-promoting behavior and avoiding health-risk behavior, as well as the costs from practicing health-risk behavior. Together, gain- and loss-framed messages using common salient images link prevention and health promotion goals within single interventions. The use of positive image messages for health-promoting behavior, and negative image messages for health-risk behavior, as indicated in the BIM, has been previously identified to significantly impact behavior effects [80, 86]. Similarly, the dual framing of health messages in the BIM is believed to be important to reducing framing effects [54]. While past studies have shown that it is difficult for some individuals to envision the image of a non-user [78, 79], the BIM addresses this problem by coupling the image of those avoiding a health-risk behavior (non-user) with the more easily viewed image of engaging in a health-promoting behavior. To the extent that common salient images are identified for casting both gain- and loss-framed messages as suggested in the BIM, the coupling of opposing health-promoting and health-risk behaviors is enhanced and health content is strengthened through redundancy of image portrayals.

Also as shown in Fig. 1, gain-framed messages illustrating a targeted health-promoting behavior are posited to increase perception of an existing, or create a new, prototype of a typical person engaging in the health-promoting behavior, or for some activates a more favorable future image of oneself engaging in the health-promoting behavior. Meanwhile, loss-framed messages showing a targeted health-risk behavior increases perception of an image of a typical person engaging in the risk behavior, or for some increases awareness of an image of oneself engaging in the health-risk be-

havior. Furthermore, gain-framed messages illustrating avoiding the same risk behavior increases perception of a prototype of a typical person avoiding the risk behavior, or for some increases awareness of a future image of oneself avoiding the health-risk behavior.

Increasing the perception of prototypes/future self-images is accomplished through the processes of social and self-comparison. Specifically, the process of social comparison takes place when a person compares their self-image with the typical person like them, whereas, the process of self-comparison takes place when a person compares their current self-image with a future image of themselves. Modifications in the perception of prototypes and future self-images lead to enhancements in risk and protective factors associated with targeted health-promoting and health-risk behaviors, leading to change in these habits. Once a single health-promoting and a health-risk target behavior have been coupled through the use of common images, additional health behaviors can be joined, increasing the number of behaviors addressed in an intervention. For example, eating nutritious foods could be coupled with engaging in physical activity as health-promoting behaviors, while cigarette smoking could be coupled with alcohol use as health-risk behaviors.

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### **Project Sport: an initial application of the BIM**

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Project Sport is a brief intervention based on the BIM, consisting of an in-person health behavior screen, a one-on-one consultation, and a take-home fitness prescription [104]. The brief, seven-item screen was developed to provide tailored image feedback on six health behavior areas, including sport and physical activity, exercise, physical activity norms, breakfast and nutrition, sleep and rest and alcohol initiation and use. The consultation is administered using a standardized protocol designed to provide tailored, scripted gain- and loss-framed messages to adolescents one-on-one. At the conclusion of the tailored consultation, a fitness



prescription is provided to adolescents recommending them to set goals to improve their health behaviors, such as physical activity and alcohol avoidance.

Operationally, the BIM is reflected in Project Sport's primary health-promoting behavior targets of sport participation and physical activity, and health-risk behavior targets of alcohol initiation and use, based on literature-linking physical activity and substance use [86–88]. Additional health-promoting behaviors, such as eating a healthy breakfast/balanced nutrition and adequate sleep/rest, are identified as secondary targets based on their supportive role in maintaining an active lifestyle. In addition, salient other/self-images associated with those engaged in the primary health-promoting behaviors of sport and physical activity, like being fit/in shape, healthy, strong, popular and confident, are supported by self-image literature [59–61].

Gain-framed messages in the Project Sport consultation illustrate how sport participation and physical activity promotes the attainment of salient images such as being fit and looking confident, while loss-framed messages show how alcohol initiation and use interferes with these image outcomes and success in sports and physical activities. In addition, gain-framed messages in the consultation highlight that the avoidance of alcohol use further promotes and supports the attainment of important images and health-promoting habits. Subsequent gain- and loss-framed messages illustrate how other health-promoting behaviors, like balanced nutrition and adequate sleep, support sport and physical activity participation in achieving salient images (gain framed), while alcohol use interferes with these behaviors and attainment of key images (loss framed), but avoiding alcohol consumption promotes achievement of both positive images and behaviors (gain framed). In summary, Project Sport provides an early illustration of how the BIM may be applied to the development of brief, multiple behavior health interventions. Messages that frame how related health-promoting behaviors are important to achieving salient outcomes (i.e. other/self-images) as illustrated in Project Sport, and how associated health-risk behaviors serve as barriers to attaining positive

behaviors and desired images unless avoided or limited, can serve to further expand the number of behaviors targeted in health interventions.

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### The BIM as a unique model of brief intervention

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There is no single accepted definition of brief intervention, however, two primary models have been previously described [21]. These include a 'tailored/teachable moment' model and a 'counseling/individual needs' model. The tailored or teachable moment model of brief intervention is typically provided in health care settings, and involves minimal contact with a health professional to help motivate a person to reduce risk [105]. These types of brief interventions often involve the use of a screening procedure to collect information for tailoring intervention messages to risk level or for personalizing content. Brief interventions of this type can include individualized and motivational feedback, information and advice [106]. The counseling or individual needs model of brief intervention involves time-limited, patient-centered counseling focusing on changing behavior [107]. These interventions are commonly administered by mental health or treatment specialists and target single-risk behaviors, as well as related cognitive factors like readiness for change, self-efficacy and social norms. Brief interventions of this type are most often based on motivational-interviewing techniques [107], which emphasize reflective listening, discussion of treatment obstacles and elicitation of motivational statements.

The BIM presents a unique, third model of brief intervention which might be called the 'image or multiple behavior' model. Table I compares elements of typical brief interventions representing the two aforementioned primary models, with the Project Sport brief intervention based on the BIM. As this table shows, a brief intervention based on the BIM differs from typical brief interventions on a number of important components.

Most notably, the BIM-based brief intervention targets pairs (i.e. couplings) of health-promoting

**Table 1.** *Comparison of typical brief interventions with one based on the BIM*

Typical brief interventions	BIM intervention (Project Sport)
Targets single, usually risk behaviors	Targets pairs of health-promoting (HP) and health-risk (HR) behaviors
Screening for determining risk level and tailoring messages	Screening to personalize messages to targeted health behaviors
Uses risk-based content	Uses image-based content
Provides feedback regarding personal or normative risk or impairment	Provides HP and HR behavior gain- and loss-framed messages and feedback
Provides advice and change options	Provides recommendations and goal setting
Can involve unstructured, client-centered interview	Involves a structured, scripted protocol
Provided during teachable moments or opportunistic events	Provided without regard to opportunistic or teachable moments
Results in single behavior outcomes	May result in multiple behavior outcomes

and health-risk behaviors, instead of single-risk behaviors as in most brief interventions. Another key difference between the interventions is that the brief BIM intervention uses image-based content and provide health promoting and health risk behavior gain- and loss-framed messages, versus risk-based content and personal or normative risk feedback provided in typical brief interventions. The BIM-based intervention involves a structured, scripted protocol and may be provided without regard to opportunistic moments, while most brief interventions involve unstructured, client-centered communication (i.e. motivational interviewing), and are oftentimes provided during opportunistic or teachable moments, such as in medical or therapeutic settings. Lastly, the BIM intervention has the potential to influence multiple behavior change due to targeting several behaviors, while most brief interventions result in single behavior modification. In summary, while brief interventions of nearly all types are designed to be time limited and are aimed at increasing motivation for behavior change, brief interventions based on the emerging BIM will differ considerably from those commonly used to date. The primary differences rest in the BIM's emphasis on using salient images to build gain- and loss-framed messages aimed at coupling and affecting multiple and divergent health behaviors, compared with providing feedback on personal or normative risk or client-centered counseling aimed at changing single-risk behaviors.

## Conclusion

In conclusion, the BIM was presented as an innovative paradigm for planning multiple behavior health interventions emphasizing holistic, personal development messages. As such, the BIM proposes an innovative approach for developing brief interventions specifically, as well as health behavior programs in general. While multiple behavior interventions have the potential to overwhelm participants, be too time demanding or costly, and fail to address any single behavior in enough depth [108], Project Sport has demonstrated that brief, multiple behavior programs based on the BIM can be successfully developed to integrate and affect health promotion and prevention aims [104].

Given this is an emerging model, additional research is needed to further test the potential of the BIM for both understanding multiple behavior change, as well as for developing and evaluating more efficacious and cost-effective health behavior programs for youth and adults. With this in mind, the following recommendations for future research are provided: (i) examine the interrelatedness of multiple health-promoting and health-risk habits across the lifespan, and the role of factors such as gender, ethnicity and cultural differences to moderate multiple behavior change and adoption; (ii) investigate a broad range prototypes and future

self-images, and how they are perceived, for influencing risk and protective factors, and health-risk and health-promoting habits of youth and adults; (iii) investigate image-based gain- and loss-framed messages as proximal mediators for significantly enhancing the efficacy of behavior health interventions, and moderators that will determine those most likely to benefit from these messages and (iv) examine the efficacy and cost-effectiveness of brief and non-brief multiple behavior interventions based upon the BIM, employing various combinations of behaviors and salient images for youth and adult populations.

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### Conflict of interest statement

None declared.

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