# Applying Behavioral Science to Behavior Change Communication: The Pathways to Change Tools

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*Entertainment-education (EE) is a popular vehicle for behavior change communication (BCC) in many areas of public health, especially in the developing world where soap operas and other serial drama formats play a central role in encouraging people to avoid risky behavior. Yet BCC/EE developers have been largely unable to integrate behavioral theory and research systematically into storylines and scripts, depending instead on external, technical oversight of what should be an essentially local, creative process. This article describes how the Modeling and Reinforcement to Combat HIV/AIDS project at the Centers for Disease Control and Prevention has developed a set of tools through which creative writers can exercise greater control over the behavioral content of their stories. The* Pathways to Change *tools both guide scriptwriters as they write BCC/EE storylines and help project managers monitor BCC/EE products for theoretical fidelity and sensitivity to research.*

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Every behavior change communication (BCC) intervention developed or supported by a public health organization gives a nod to behavioral theory. The language of risk reduction, impediments to change, the importance of reinforcement, and the so-called KAP-gap between knowledge and attitudes on one side and practices on the other is found throughout the BCC literature. Furthermore, those who work on BCC projects using popular media as a vehicle— entertainment-education (EE) projects—demonstrate a clear concern for behavioral science and behavioral research (Brooke, 1995; de Fossard, 1998; Japhet, 1999; McKee, Aghi, Carnegie, & Shahzadi, 2003). Behavioral theory and research, it is thought, provide information that helps the BCC/EE project to depict the lives of its fictional characters in a realistic and authentic manner. And yet, the task of integrating theory and research into the essentially creative process of BCC/EE has proven difficult. However committed to research and theory developers of BCC/EE projects may be, most would readily acknowledge that in practical terms, this commitment is not systematically translated into the scripts of stories that are designed to help people change risky behaviors. This is largely due to a lack of tools that bridge the divide between the artistic world of storytelling and the demands of a structured, science-based, public health intervention.

In 2000, the Centers for Disease Control and Prevention (CDC) developed MARCH (Modeling and Reinforcement to Combat HIV/AIDS) as a behavior change strategy suitable for sub–Saharan Africa (Galavotti, Pappas-DeLuca, & Lansky, 2001). Supported primarily by the Global AIDS Program of the CDC, the MARCH strategy has to date been introduced to teams working in Botswana, Ethiopia, Ghana, Guyana, Uganda, and

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Zimbabwe. MARCH has two basic components: The first uses serial drama to model for listeners the kinds of behavioral challenges faced by people and communities where HIV and AIDS dominate many aspects of life. Such modeling presents alternative ways of thinking and acting by providing audiences with the opportunity to identify with characters facing situations that are recognizable and "authentic" (Petraglia, 1998). By portraying realistic characters in culturally relevant situations, MARCH serial dramas (currently developed using print and radio media) illustrate the difficulties people encounter when they attempt to change their behavior. These dramas model the social, linguistic, and performance skills needed to avoid risk, to support others as they try to change, or to live positively with HIV/AIDS. The second component of MARCH promotes community-level reinforcement activities that stimulate social and structural changes and complement the cognitive, affective, and behavioral changes modeled in the drama.

This article focuses on the *Pathways to Change* tools designed to support the first component of MARCH: the serial drama. Of course, the storytelling tradition in Africa is well established (Panford, Nyaney, Amoah, & Aidoo, 2001), and in each of the countries where the MARCH strategy has been undertaken, local creative talent has been readily available. MARCH has drawn on this talent to create serial dramas such as *Makgabaneng*

(in Botswana) and *Mopani Junction* (in Zimbabwe), which have been remarkably successful in terms of gaining a wide and enthusiastic listenership (Pappas-DeLuca et al., 2003). This is important because a serial drama that does not appeal to its audience as a drama is unlikely to garner the attention necessary to succeed as a behavioral intervention. Nevertheless, linking the art of serial drama to the science of behavior change, we have found, requires structure and support because most scriptwriters are unaccustomed to the demands that behavioral intervention makes on the writing process. We would argue that *Pathways to Change* tools provide one means of bridging this gap between art and science.

## ▶ KEY PRINCIPLES UNDERLYING THE *PATHWAYS TO CHANGE* TOOLS

The *Pathways to Change* tools seek to support the application of three behavior change theories or principles at the heart of MARCH EE programs: (a) behavioral ecology, or understanding the environment in which change occurs; (b) social cognitive theory; and (c) the transtheoretical model of change. Articles written by Galavotti and colleagues (2001, 2005) provide a more extended discussion of MARCH's theoretical background and objectives.

### Behavioral Ecology

A simple model of behavioral ecology may be conceptualized as a series of three concentric circles labeled "individual," "social," and "environmental." In the innermost circle lies the individual person. This person is an agent capable of making decisions based on his or her knowledge, prior experience, appraisal of a situation, and ability to deal with it. Of course, people live within a family and a community, and this social dimension of a person's behavioral ecology plays a large role in shaping how the person represents the world, and its possibilities and limitations, to himself or herself. Moving farther out, this social dimension is embedded in the environment— the cultural, structural, and material contexts that shape local realities and set up physical and logistical barriers that must be overcome if behavior change is to be achieved.

### Social Cognitive Theory

Two psychosocial constructs that are prominent in Bandura's (1986, 1997) articulation of social learning theory and that have received extensive scientific validation are outcome expectation and self-efficacy. Outcome expectations are beliefs that a given behavior will lead

to certain outcomes. These anticipated outcomes can be powerful incentives, or disincentives, for engaging in behaviors. Expectations can involve personal, social, or material outcomes. For example, positive outcome expectations might include expectations of material rewards such as good health or prosperity; social rewards might include increased status, recognition, and support; and personal rewards might include fulfillment of the role of good mother or responsible son. Alternatively, negative outcome expectations associated with specific behaviors could include loss of a job (material), rejection by family (social), or a sense of shame or inadequacy (personal).

The other key psychosocial principle central to social learning theory that MARCH highlights is self-efficacy, or people's confidence in their ability to perform a certain behavior. As self-efficacy beliefs increase, people are more willing to attempt behaviors and to persist in behavior change efforts in the face of setbacks.

### Behavioral Trajectory

The transtheoretical model of behavior change (often called the "stages of change" model) provides a heuristic for describing the progression people go through when changing a behavior (Prochaska, Redding, Harlow, Rossi, & Velicer, 1994). The model proposes five stages through which people move in their process of change. The first stage, "precontemplation," is when a person is not thinking of changing the behavior because of either a lack of knowledge or lack of will. From the point at which a person begins to think about changing his or her behavior, he or she enters the "contemplation" stage. Next, when people develop a tentative plan of action for changing their behavior, they are in the "preparation" stage. This stage is generally followed by an attempt at behavior change in which the person is said to move into the "action" stage of the model. Once action is taken and a successful change occurs over time, the final and what many consider to be the most difficult stage—"maintenance"—is entered.

Although the five stages are sequential, moving through the stages of change is almost never a straightforward process—people may suffer setbacks at any point. Factors such as one's self-efficacy or social support are critical in overcoming setbacks and taking up the challenge of behavior change anew. A behavioral trajectory, therefore, plots the path that a person takes through the stages of change. In MARCH serial dramas, characters destined to model a specific behavior change (i.e., a transitional character) must move through the stages of change in a plausible manner and at a believable pace. Below, we suggest how the Pathways to Change training tools put the notion

of behavioral trajectory and other behavioral principles into dialogue with both behavioral research and the creative nature of storytelling.

## ▶ APPLICATION OF THE PATHWAYS TO CHANGE TOOLS

Pathways to Change is comprised of three tools: a game, a chart, and a behavior change adherence (BCA) routine. The use of all of these tools is predicated on formative research to ascertain the behavioral context of reproductive and sexual health within the priority population. A basic formative assessment will consist of a range of instruments, including surveys of basic knowledge, attitudes, and practices; focus groups with participants from the priority population; in-depth interviews with community and opinion leaders; and a summary of recent findings from epidemiological and behavioral research. The assessment is expressed in the form of a data summary grid: a simplified list of bulleted data grouped according to an intervention's behavioral objectives (e.g., "reduce stigma toward people living with HIV/AIDS," "seek testing services," and "reduce the number of partners"). The brief excerpt in Figure 1 gives an example of a data summary grid format that scriptwriters draw on to create their storylines using Pathways to Change.

The data summary grids enable creative writers and other local stakeholders to use the Pathways to Change game and chart to (a) demonstrate how key concepts from behavioral science can be used to generate narratives that are entertaining yet behaviorally sound and (b) acquaint themselves with relevant data from the formative assessment and apply them in character-appropriate ways.

### The Pathways to Change Game

The game is the more complex of the two Pathways to Change training tools and has two distinct phases: a board game and a story writing phase. At the outset of the board game phase, a moderator divides participants into two teams of two or more players. To start, teams are dealt a series of cards that, taken together, describes the character they will represent in the game. For example, Team 1's character may be "Fatima, an uneducated 34-year-old woman who has never married but has three children by the same man. She lives in a village that is economically stable but has no medical facilities other than a clinic that is staffed only by a nurse. Her behavioral objective is to prevent mother-to-child transmission of HIV." Team 2's character might be "Theo, a 23-year-old apprentice truck driver who has a steady girlfriend in his hometown but nevertheless seeks out commercial

| 1. Increasing Access to Care | | |
|---|---|---|
| **B A R R I E R S** | | |
| MEN | WOMEN | Mixed/Undetermined/General |
| • Some young men said that people are no longer able to afford hospital bills and to pay for Western medicines, so they are going back to traditional medicines. *– urban focus group*<br><br>• "Transport to send infected people to the clinic is a problem. We use a scotch cart, which is drawn by donkeys, and this takes hours to reach the clinic." *– rural focus group* | • "Most people feel shy to ask the sensitive questions during group discussions because they think others will think that they are so inquisitive because they have the disease." *–urban focus group with married women*<br><br>• 90% of women 15–29 years of age have never been tested, in part because of lack of access to testing (affordability, distance, and lack of knowledge about where to go). *– 2001 YAS* | • People end up hiring cars to ferry the injured to hospital. The sick person may be seriously ill and end up dying on the way to the clinic. *–rural focus group*<br><br>• The gov't does not administer voluntary testing of HIV for individuals, but resorts to HIV testing only for patients with prolonged illness who are suspected to be HIV related. *– 2001 UNAIDS report*<br><br>• Less than 10% of population are under a health insurance scheme. *– 2000 BSS* |

**FIGURE 1    Excerpt From Zimbabwe's Data Summary Grid, 2002**

sex workers when he is on the road. His hometown is a township outside a major city with many, albeit expensive, medical facilities. His behavioral objective is to seek voluntary counseling and testing."

With these characters in mind, the two teams play a board game (shown in Figure 2) in which they roll a die to move along a pathway of squares toward a finish line. Most squares are marked with a *B* (for "barrier") or an *F* (for "facilitator"). Each barrier or facilitator square is further marked by a small *p* ("personal"), *s* ("social"), or *e* ("environmental"); thus, a barrier is always either a *Bp*, *Bs*, or *Be*, and a facilitator is always either an *Fp*, *Fs*, or *Fe*.

When a team lands on one of the barrier or facilitator squares, it is required to consult its data summary grid to find a datum from the formative assessment that fits the square's assignation. For instance, if Team 1 lands on a *Bp* square, it will consult the "Prevention of Mother-to-Child Transmission" chapter of the data summary grid for some bit of information that could pose a personal barrier to Fatima as she seeks to attain her behavioral

objective. For example, it may select the datum reading "Few people in rural communities believe that there is a link between a mother's health and that of her unborn child." If the moderator confirms that Team 1's reasons for selecting this datum as a personal barrier are sound, he or she writes the barrier on a card and gives it to Team 1 to keep until the end of the game.

The squares marked with a *?* indicate that the team that lands on them has to draw a "Question Card." These cards ask a wide range of general knowledge questions (not necessarily from the formative assessment, but questions that local stakeholders think everyone should know about HIV/AIDS). Conversely, if the team lands on a "Setback" square, it just collects a setback card, which will be used in the storyline writing phase to indicate a reversal in the character's progress toward his or her behavioral objective.

By the time both teams have completed the board game phase by moving along a pathway and reaching the finish line, they will have collected a mix of behavioral facilitators, barriers, and setback cards relevant to their specific character and his or her behavior change
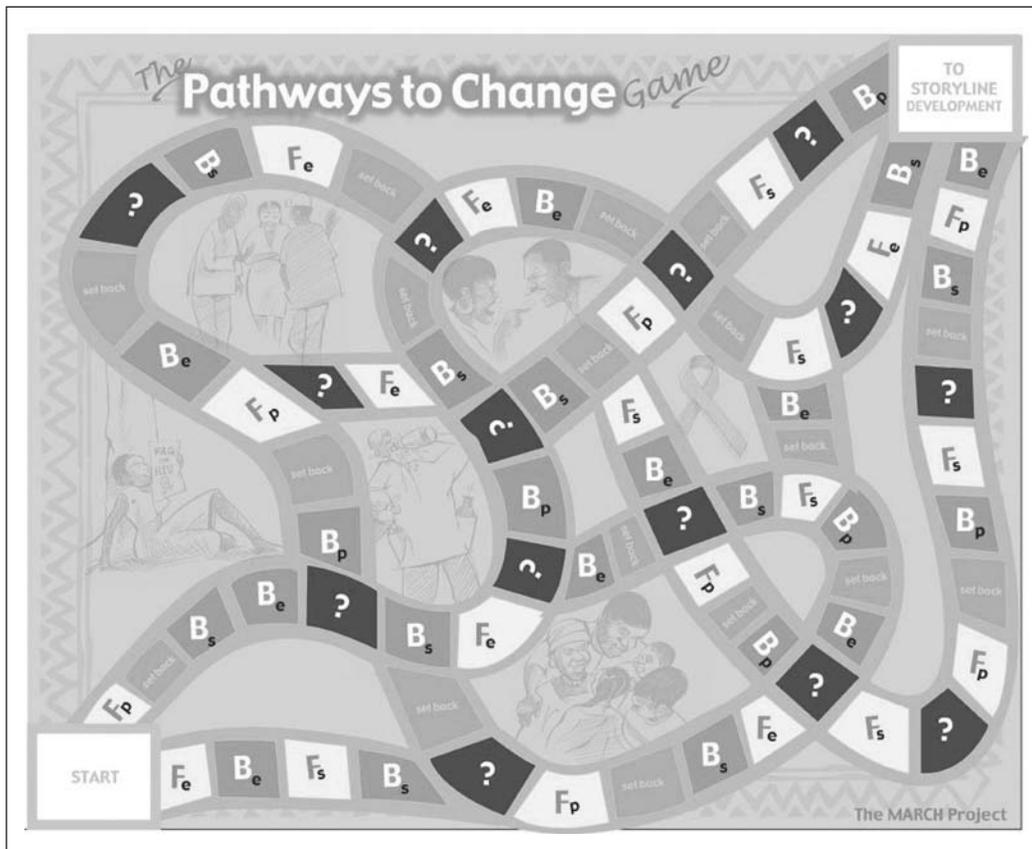
FIGURE 2 *Pathways to Change* Game

objective. Teams are now ready for the storyline writing phase of the game. In this phase, teams are given about an hour in which to write a brief story about their character that integrates the barrier, facilitator, and setback cards they possess.

### The Pathways to Change *Chart*

As a result of repeated exposure to the *Pathways to Change* game, scriptwriters gain a greater familiarity with the formative assessment as expressed in the data summary grids and consider how this assessment provides information about barriers and facilitators to behavior change that dramatic characters might face. Introducing the *Pathways to Change* chart at this point reminds team members that behavior change is a process that occurs in stages and that their goal is to create a realistic model of behavior change with which the audience can identify. The chart, shown in Figure 3, is a grid whose vertical column sets out the five stages of change and whose horizontal axis provides a timeline.

Using the chart, the moderator helps each team plot the storylines written as a result of the game. Once the storyline has been plotted, the moderator asks the users to identify (a) where barriers and facilitators influenced the trajectory, (b) how setbacks are reflected in the trajectory, and (c) areas of the trajectory that are implausible given what we know about how people change. By using the *Pathways to Change* game and the chart in succession, scriptwriters acquire an appreciation both for the complexity of behavior change and for their jobs as developers of a serial drama that entertains as well as models realistic behavior change for the audience.

### The Pathways to Change *BCA Routine*

The challenge for a MARCH scriptwriting team does not stop at learning how behavior change principles can be integrated into an entertaining narrative. The challenge continues in figuring out whether the team is, indeed, modeling these elements and revealing to the listeners how characters are thinking, feeling, reacting, and moving
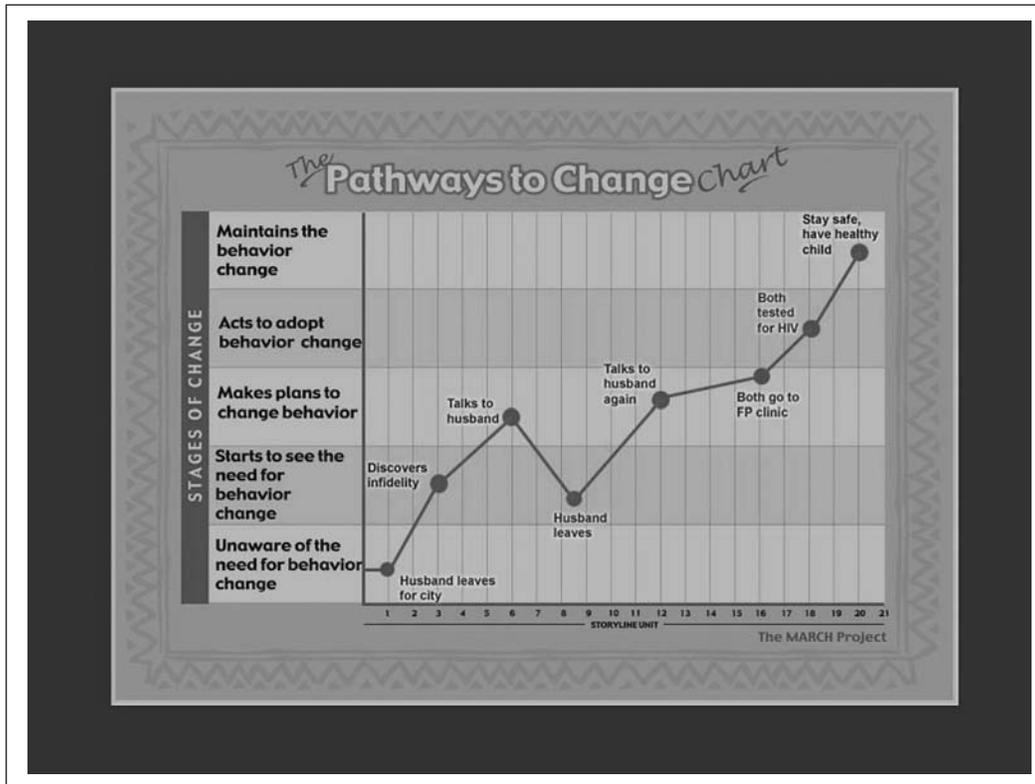
FIGURE 3    *Pathways to Change* Chart

toward their behavioral objectives. Our response to this challenge is reflected in the *Pathways to Change* BCA routine, which centers on the notion of speech acts.

Although the term *speech act* comes out of linguistics and literary theory (Austin, 1975; Searle, 1985), it has a more generic usage that is very valuable in BCC/EE projects that depend on language as a means of intervention. The notion of a speech act is meant to call attention to the distinction between what language says and what language does. All utterances have these two dimensions, and we usually find little reason to distinguish between them. In BCC/EE projects, however, it is critical that we ensure that the words we script actually correspond to the behavior change ideas being put forth. Ironically, this is something that creative writers are sometimes trained to avoid, having been encouraged to believe that good writers show rather than tell. In literary practice, this dictum may be true, but in a BCC/EE intervention using dialogue, behaviors revealed by showing must be accompanied by telling; audiences must actually hear behavior revealed in what characters say.

The BCA routine makes operational two distinct levels at which scriptwriters must integrate behavior change concepts into the serial drama. The "macro" level sets out a character's behavioral trajectory over time, guides the overall development of the storyline, and keeps it in line with broad theoretical objectives. The "micro" level serves to guide scriptwriters in actually putting words in the characters' mouths and ensures that what the storyline was designed to model at the macro level is executed in the dialogue. Used consistently and conscientiously, a three-part BCA routine (a macro chart, a micro process, and a coordinating tool that bridges the macro and micro process) enables BCC/EE implementers and managers to plan for, monitor, and evaluate the behavioral integrity of scripts.

*The macro chart for mapping the behavioral trajectory.* MARCH projects require a tool that enables scriptwriters to track each transitional character's behavioral trajectory over time and across stages of change; this macro chart, therefore, looks identical to a completed *Pathways to Change* chart (Figure 3) but is used in a very different way. A macro chart for a character named Sam, for instance, will plot a line representing key junctures and events of Sam's behavioral trajectory. These junctures and events reveal a particular stage of change or a transition point between stages. For instance, the first time Sam refuses to go to a brothel with his friend Martin may mark a transition from the preparation stage to the

action stage. In this case, the scriptwriting team will put a bullet on the macro chart at the approximate time in the storyline that it plans for this event to occur and within the appropriate stage of change. As the actual storyline is written over time, the timing of events may shift slightly, although the sequencing remains unchanged.

*The micro process notation system.* As noted above, a speech act is a bit of dialogue that reveals something about a character's progress toward his or her behavioral change objective. If Sam, for instance, were to say to Martin, "Hey, man, I just got my paycheck—let's find some girls and party!" the listener would know that Sam is not concerned that this sort of behavior is risky. Conversely, if he were to think aloud, "When I drink too much, I end up waking up next to a stranger. . . . I should try to stay out of bars," the listener would know that he is aware of the problem and thinking about how to handle it. By using speech acts as a means of conveying characters' thoughts and feelings, scriptwriters can structure dialogue that tells the listener not only where characters are in terms of behavioral change but also about common barriers and facilitators to behavioral change that are relevant in their community.

The micro process is simply a means of coding speech acts that signal the attitudes, beliefs, and interpersonal relationships that MARCH is trying to model. In MARCH we use seven types of speech acts:

A. Speech revealing specific psychosocial variables (e.g., risk perception, outcome expectation, and self-efficacy) that signal the character's stage of change.
B. Speech revealing helpful and unhelpful metacognition (e.g., "When I'm really angry, I'm not able to think straight" or "Before I confront her, I better think through what I really want to say").
C. Speech illustrating social facilitators or barriers (e.g., requests for, offers of, or denial of help, support, or empathy).
D. Speech modeling both positive and negative debate and negotiation (e.g., arguments, exchange of ideas, and problem solving).
E. Speech articulating both positive and negative beliefs, attitudes, desires, or fears relating to the behavioral objective.
F. Speech unambiguously signaling an intention to act.
G. Speech in which an environmental or structural barrier or facilitator is identified.

Using this coding system during and after the scriptwriting process requires the scriptwriting and production team members to consider questions such as "Where in the dialogue do we signal at what point characters are in terms of their stage of change?" "Where do we model useful social interaction and support?" and "Are we making characters' thoughts and feelings about how they are experiencing their behavior change explicit?"

*The coordinating tool for linking the macro chart to the micro process.* It is necessary to integrate behavior change information at the trajectory level to specific bits of dialogue found in the script; thus, a third tool is needed to coordinate these two levels. The coordinating tool (Figure 4) is a blown-up segment of the macro chart that zooms in on the section of the storyline currently under development and provides scriptwriters with a more usable piece of the macro chart to guide their micro process notation.

As with the *Pathways to Change* game and chart, creative writers' collaborative use of the BCA routine teaches and reinforces otherwise abstract concepts. For instance, a discussion in which the micro process is undertaken might go something like this:

> Writer 1: In this scene, Sam is in precontemplation, and in previous scenes we've shown that he does not believe he is at risk of HIV and that he sees nothing wrong with going to commercial sex workers. As we can see, most of the codes we have written on the coordinating tool until now are *A* and *E*.
> Writer 2: Yes, but because we can see from the macro chart that Sam needs to start moving toward the contemplation stage, perhaps we should have some social facilitation going in this next scene. So we'll need to script a *C* type of speech act soon . . . well, maybe not in scene 46 but definitely no later than scene 48. Also, this social facilitation might come in the form of an argument he has with his older brother who tells him that going to brothels is an embarrassment to the family. Hmmm . . . that might give us a chance to model a good argument against casual sex—that's one of those *D* speech acts as well as a *C* speech act. We kill two birds with one stone!

Of course, this imagined exchange is a bit stilted, but it demonstrates several key points about undertaking the BCA routine, especially the micro process. For instance, it shows how the codes help structure the behavior change content of the scenes, but they do not dictate the dramatic content. Second, with practice, the codes can provide a shorthand for talking about what has to happen in terms of behavior change without getting theoretical. Finally, note that a single speech act can serve multiple purposes; for instance, an interior monologue can not only show reflection on one's thinking (B), but also model problem solving (D). In other words, using
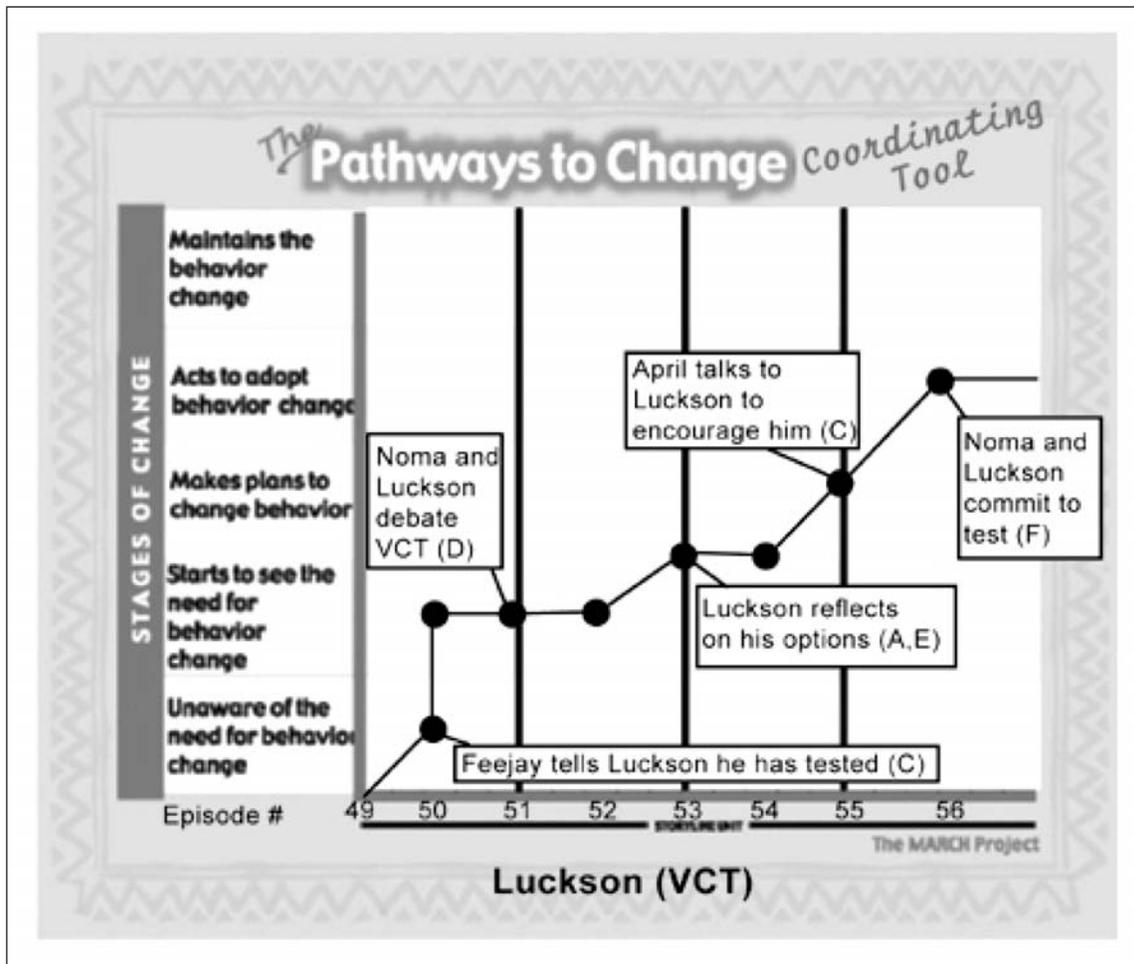
**FIGURE 4   The Coordinating Chart**

codes for speech acts helps structure the behavior change elements in the drama before writers move on to actually scripting the dialogue.

## ▶ DISCUSSION

This article has outlined both the challenges we have faced in developing theoretically sound and research-sensitive BCC/EE and our response to those challenges. In setting out the *Pathways to Change* tools, we have sought to illustrate how they can be used to address several key junctures in intervention design and implementation in areas such as building local scriptwriter capacity to use behavioral theory and research, developing the product, and monitoring the theoretical integrity of scripts. Although we believe that aspects of our approach are applicable to any behavior change intervention, this explication of *Pathways to Change* tools may be useful primarily to readers as a case study: an account of how one project has approached the integration of behavioral science with narrative forms such as serial drama.

This is not to say that use of the *Pathways to Change* tools has always been seamless or that scriptwriters are always eager to embrace the approach to BCC/EE that the tools are designed to structure. Among scriptwriters working on *Mopani Junction* in Zimbabwe, for instance, there seemed to be a persistent desire to script sensational and exceptional events to explain sudden behavior changes rather than using the more mundane barriers and facilitators identified during the research. We frequently noted

scriptwriters' tendency to make the passage from stage to stage too neat and to treat setbacks as dramatically awkward obstacles in an otherwise linear path.

In Zimbabwe and elsewhere, the scriptwriting teams had to be periodically reminded to keep on top of the macro and coordination charts throughout the 18-month production period and encouraged to integrate a range of useful speech acts for each scene rather than just building the dialogue around a couple of key speech acts. Related to the issue of speech acts, some writers continue to find it difficult to convey the full range of psychosocial and social influences on characters using words. Conveying decision-making processes and the operation of supportive or unsupportive social norms through dialogue, for instance, is a novel challenge for many writers. This also seemed to be the case in Ghana and Uganda at the outset of the respective dramas.

Most fundamentally, perhaps, in a few instances, scriptwriters—and especially older and more experienced scriptwriters—have complained that the *Pathways to Change* tools hinder their creativity. Younger writers, on the other hand, seem to adopt the *Pathways to Change* approach with relative ease; this may be due to the fact that they are newcomers to the genre of serial drama as well as to the tools and thus have fewer expectations that can be confounded. Ongoing support as they use the tools, however, suggests that complaints about constrained creativity generally give way to an appreciation for the depth of creativity that remains available. In the words of experienced scriptwriter Tafadwa Njovana,

> For me it was like being thrown into the deep end. You had to learn a lot of new concepts very quickly and learn how to interact with people that do not come from an artistic background . . . [people] who come from the scientific side, the behavior change side. But all of us are the better for it. (Riber, 2004)

Challenges aside, we have also been surprised by some of the ways in which scriptwriters have taken ownership of *Pathways to Change* tools to serve purposes we had not originally anticipated. For instance, whereas we intended the game to be used exclusively as a training tool that introduces a number of key principles, we have found that some writing teams continue to play the game, even after the drama is on the air, not only using research in the data summary grids, but also drawing on scriptwriters' own thinking about personal, social, and environmental barriers and facilitators. Members of the writing team have reported that when they are bogged down thinking through a set of difficult scenes, playing the game using the actual characters in question provides a way of helping them break through creative impasses.

In short, although scriptwriter adoption and use of the *Pathways to Change* tools may require monitoring and guidance from a lead editor, from the perspective of the MARCH project leader, the consistent and correct use of the *Pathways to Change* tools provides a reasonably transparent means of ensuring that the serial dramas are conveying the behavior change ideas as intended. In terms of process evaluation, the tools permit MARCH project leaders and managers to assess whether characters are modeling the kinds of thought, behavior, and discussion they are expected to model and that plausible barriers and facilitators that motivate behavior change are made evident. Keeping track of all this information and archiving the *Pathways to Change* BCA routines provide a good deal of the information needed to assess the effectiveness of the serial drama and to determine whether listeners are using transitional characters as role models to help them change their own risk behaviors.

## ▶ CONCLUSION

Many health professionals in Africa and elsewhere acknowledge the importance of BBC/EE in helping people make sense of their lives and the health risks that endanger them, yet the tenets of behavioral science have proven difficult to integrate into the actual scripts. When we first undertook the MARCH project, tools promoting this integration were unavailable; guidelines and techniques created for use in some other BBC/EE projects either gave practical advice on the scriptwriting process independent of research or behavioral science, or they reiterated the importance of making theory- and science-based interventions without providing much in the way of practical scaffolding.

The *Pathways to Change* tools, we believe, go some way toward making BCC/EE more behaviorally sound and amenable to process evaluation. These tools reinforce the premise that creative writers can see their job of scripting behavior change as entirely compatible with their desire to tell interesting stories. They do this not only by introducing new vocabulary and a behavioral worldview but also by helping writers articulate and integrate many technical aspects of behavior change that are often ignored.

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