

Behavioral Approaches  
to **INJURY  
CONTROL**



CONFERENCE PROCEEDINGS  
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# Contents

**Introduction ..... 5**  
**David Grossman, M.D., M.P.H.**

**Models of Health Behavior ..... 7**  
**Martin Fishbein, Ph.D.**

**Brief Behavioral Interventions To Prevent Injury ..... 27**  
**Chris Dunn, Ph.D.**

**Techniques To Promote Behavior Change in Individuals:  
Tailored Health Communication ..... 38**  
**Matthew W. Kreuter, Ph.D, M.P.H.**

**Behavior Change at the Community Level..... 46**  
**Andrea Gielen, Sc.D, Sc.M.**

**Behavioral and Social Science in Injury at CDC..... 56**  
**David Sleet, Ph.D.**

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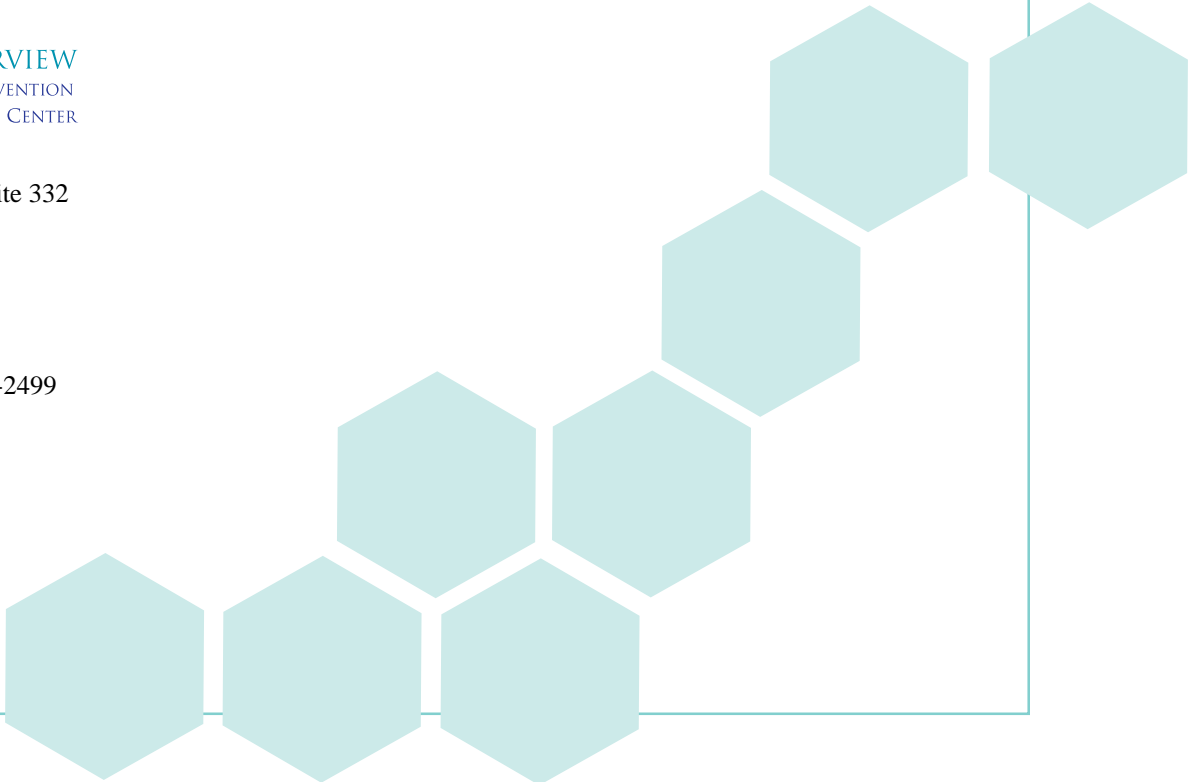
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## Behavioral Approaches to Injury Control

### Introduction: David Grossman, M.D., M.P.H.

Since its inception, the field of injury prevention has wrestled with the issue of behavior change. Dr. William Haddon, one of the early pioneers, focused his career at the National Highway Traffic Safety Administration on changing the early paradigm of injury. He adopted the public health approach of intervening at both the level of the person, or agent, and the environment. He appropriately emphasized changing vehicle design, rather than driver behavior, as a key solution to highway safety in the 1960s.

Haddon's change in this paradigm stemmed partly from the controversy surrounding vehicle crashworthiness as told in Ralph Nader's exposé, "Unsafe at Any Speed." During the 1960s, design changes to cars were recognized to have a substantial impact on safety. Seat belts, collapsible steering wheels, breakaway light poles, and divided highways required technological advances and changes in vehicle design standards to improve industry standards.

Preventing drunk driving or speeding seemed out of reach. It wasn't long before the human-factors controversy surfaced in the mid-1980s. It erupted over the issue of whether auto makers should be required to have airbags, or alternatively, whether states should mandate seat-belt use. In the eye of this intense controversy lay some basic uncertainties and controversies about the likelihood of persuading humans to wear seat belts.

In 1985, the Institute of Medicine's (IOM) panel on Injury in America issued recommendations that eventually led to the creation of a Centers for Disease Control (CDC) program, the National Center for Injury Prevention and Control (NCIPC). This 153-page document contained only one page devoted to the role of behavior change in injury prevention, and includes mostly skeptical commentary about health education. Perhaps that could be attributed in part to the absence of any behavioral experts on the panel at that time.

Twelve years later, in 1997, the IOM again tackled these issues. Susan Gallagher, one of our panelists today, was on the IOM panel and was likely one of the reasons the tone of the panel had changed. The panel made recommendations for "intensified research on differences in risk perception, risk taking, and behavioral responses to safety improvements among different segments of the population, particularly among those people or groups at highest risks of injury."

The IOM's most recent recommendations are framed by our increasing recognition that behavior is at the foundation of most of our work. There are finite limits to the hopes of full passive protection from injury. Whether it's encouraging people to wear motorcycle or bicycle helmets, buckle seat belts, use personal flotation devices, or lock-up a firearm, we must now address human behavior.

As our field diversifies and expands, we find that we must learn more about what our friends in

psychology, health education, anthropology, sociology, and others know about strategies to change or improve behavior, both at the individual and the community level. In planning this conference today, we've reached out to friends and colleagues from these professions to teach and inspire us to develop a research agenda that will provide a compass for future investigations and interventions to reduce injuries. Some of our speakers and panelists today are experts in injury. Others specialize in behavioral aspects of other health problems; this was intentional, and this mix should help us share strategies, research and insights across public health issues. Our invited audience brings together a rich mix of investigators and practitioners. We're all eager to apply what we learn today to our next study or our next program.

# Models of Health Behavior

Martin Fishbein, Ph.D.

The more one knows about the factors that underlie the performance or nonperformance of any given behavior, the more likely it is that one can design successful interventions to change or reinforce that behavior. Although there are probably almost an infinite number of variables that may directly or indirectly influence the performance or nonperformance of any behavior, there's a growing consensus that there are only a limited number of variables that need to be considered in order to predict, understand, change or reinforce a given behavior.

When we did the research for *Factors Influencing Behavior and Behavior Change* (published in *Handbook of Health Psychology*, edited by A. Baum, T.A. Revenson, and J.E. Singer), we brought together a group of experts in behavior change in the HIV area and tried to come up with a common set of variables that were important. If you look at that paper you'll see more variables than I'm going to talk about today, because in the 10 years since it was written, we've decided that some of these variables aren't as critical as we first thought, while other variables play different roles than we had initially imagined.

1. Health Belief Model
2. Social Cognitive
3. Reasoned Action
4. Planned Behavior

This limited set of variables is defined by or represented in four major theories of behavior and behavior change: the health belief model, social cognitive theory, the theory of reasoned action, and its extension to the theory of planned behavior. There are other theories that aren't being mentioned. I'm sure most of you are familiar with the stage of change model there's no variable in the stage of change model that's not included in any of these others. The IMB model has knowledge as a critical variable and none of these others do, but basically, the critical concepts are the same as what we found in these four theories.

## Health Belief Model

The health belief model is one of the oldest and is probably best known in the health area. According to this model, there are two critical determinants of whether somebody will adopt or engage in some particular health recommended behavior or health protective behavior. According to the health belief model, you have to feel personally susceptible to, that is be at risk for, some severe and serious illness. If you don't perceive that you're personally at risk, there's no reason to change what you're doing, and nothing's going to happen.

The question of risk, then, is the initial driving factor. But as important, and perhaps even more so, a person has to believe that the benefit of following the recommended action outweighs the costs and barriers. This is essentially a cost-benefit analysis. If you believe that by performing

the recommended behavior, more good things than bad things will happen, you're much more likely to engage in that behavior. Clearly, to think more bad than good things are going to happen, you're less likely to engage in it.

Cues to action are part of the original health behavior model, These are reminders that help to motivate you and get things going, but it was never clear what these cues to actions were. Most of the research is focused on four variables: costs, benefits, perceived susceptibility, and severity of the outcome. So here's one of the general theories of behavior in the health domain that says that there are really only two factors that influence behavior. If you perceive you're at risk, it's going to get you going. Then, if you believe that making this behavior change is going to have more benefits than costs, you probably will engage in it

## **Social Cognitive Theory**

Social cognitive theory also has just two critical variables. According to social cognitive theory, you have to be motivated to perform some behavior, and so again what we find is that you have to believe that performing the behavior will lead to more positive than negative outcomes. Bandura calls these outcome expectancies, and he talks about three different kinds of expectancies. They can be physical (it will keep me healthy, it will prevent a certain disease); social (it's going to make my parents happy, it's going to make my friends unhappy); or the outcomes can refer to self-standards: If I do this, I'm going to feel guilty or anxious or whatever.

But these are all different outcomes, and Bandura is basically asking, as in the health belief model: Do you believe that performing this behavior is going to lead to more good than bad things? It always goes back to cost-benefit, but Bandura adds something else that wasn't in the health belief model. More specifically, according to social cognitive theory, in order to perform a behavior you really have to believe that you have the necessary skills and abilities to perform that behavior.

In other words you have to have a sense of personal agency, or what he calls self-efficacy, with respect to performing behavior. In the simplest terms, you really have to believe that you can do it if you want to. And clearly if I don't believe I can do something, I'm not likely to try it - I don't want to fail. So in addition to being motivated to do something, I have to believe that I'm capable of doing it.

## **Theory of Reasoned Action**

So now we have three variables. We have costs and benefits, we have self-efficacy, and we have perceived risk. Now the theory of reasoned action is a little different. It starts off with the assumption that behavior is primarily a function of a person's intention to perform the behavior. But it's really saying people are pretty good predictors of their own behavior. If you really want to know what somebody's going to do, ask them and you'll get a pretty good prediction.

Behavioral prediction isn't all that hard: Why am I doing this? Because I want to or I intend to? Big deal. But it is important because it tells us that we can work on people's intentions and try to change them. So the real question is where do these intentions come from? And the theory of reasoned action suggests that there are two basic components that influence people's intentions.

On the one hand it is their attitude. Not attitudes that we talked about in the past, but attitudes towards performing the behavior in question. So if I think that doing something is good, I'm more likely to tend to do it than if I think doing something is bad. But in addition to my attitude towards performing the behavior, there are also normative pressures on me and this is a little bit different than the other theories because it's starting to take in norms. Bandura would argue he had it in his model when he talked about social consequences. But the subjective norm is really my perception of what others expect me to do or think I should do. It's the pressure I perceive in a sense to engage or not engage in this behavior.

Now it's fine to talk on this general level and ask, "So why do you do it?" "I do it because I intend to." "Well, why do you intend to?" "I intend to because it's either a good thing to do or because most people who are important to me think I should do it". Not very profound; which is probably one of the reasons it works so well. If it didn't work so well, if you didn't do things that you thought were good things to do, or things that you felt a lot of pressure to perform from your important others, this would be a very chaotic world.

So, as I said, this is not a very profound theory. As we'll see, one of the things that makes the theory interesting is that, depending upon the behavior and the population, one of these factors may be more important than the other. So some behaviors may be entirely driven by attitudes, others may be entirely driven by norms. One of the implications is that you're going to have to design very different interventions if you've got an attitudinally driven behavior than if you have a normatively driven behavior. But how do you change an attitude? Where do they come from? How do you change norms?

The theory tried to address that as well, and it states that the attitude toward performing a behavior is a function of the person's beliefs that performing the behavior will lead to various good and bad consequences. It's again the expectancy value notion. Notice all of these theories have this one piece in common, and then they all, in a sense, add one other thing. You start with the outcome expectancies and the health belief model says well, you'd better worry about perceived risk and Bandura says no, you better worry about self-efficacy. And I'm saying, you'd better worry about norms, what other people think you should do.

And that's not to say you can't put it all together and one of the things I'll try to do is build what I'm calling an integrative model that tries to put these pieces together. Just as attitude is a function of underlying beliefs, so too is the subjective norm, and it's a function of beliefs that a particular individual thinks you should or shouldn't perform this behavior and how much you're motivated to comply with that person. And it's not compliance with the behavior, it's whether this person an important referent. In general, do I want to do what this person thinks I should? I may not always want to do exactly what my mother says I should do, but in general, I want to do

what my mother thinks I should do, and it's that aspect of the normative pressure that we're trying to capture.

## Theory of Planned Behavior

The last theory I'm going to talk about is theory of planned behavior, an extension of the theory of reasoned action that was done by my colleague Icek Aizen. He added the concept of perceived behavioral control as a predictor of both intention and behavior, and when he first introduced this, he actually was talking about perceived behavioral control as if it were very similar to self-efficacy.

### Theory of Planned Behavior

1. Behavior is a function of intention and perceived behavioral control.
2. Intention is a function of attitude, subjective norm and perceived behavioral control.
3. Perceived behavioral control is a function of control beliefs .

There's been some fuzziness going on and I'll show you what a little of that is when we get to the measurement part, but what he's saying is: Behavior is a function of not just intention but also of perceived control. Again, if I don't really think I can do it, I'm not as likely to try to engage in it. But intention, as well as being a function of attitudes and subjective norms, also is a function of perceived control if I don't believe I can do it, if I don't think I can do it, I'm not likely to intend to do it.

### Based on these four theories, there are five key variables:

1. Intentions
2. Attitudes
3. Norms
4. Self-efficacy and/or perceived behavioral control
5. Perceived Risk

Just as the theory of reasoned action asks where these attitudes and norms come from, Aizen talks about where perceived behavioral control comes from. He says, that like attitudes and norms, it's a function of underlying beliefs that certain events or circumstances will be present when you're trying to perform the behavior. There's also what he calls perceived power - how likely is it that if this event or circumstance is present, it would make it easy or difficult to engage in the behavior.

Based on these four theories, it would appear that at most, there are probably four or five key variables. There are people's intentions to engage in a behavior; attitudes that are based on underlying behavioral beliefs or outcome expectancies; norms, self-efficacy (or perceived control), and perceived risk. And I would argue that norms should include not only perceptions of what others expect you to do, but perceptions of whether these others are doing it. That is, there's a distinction that's being made between a subjective or an injunctive norm and a descriptive norm or a behavioral norm. As in, do what I say, not what I do.

Well, kids do what you do as well as what you say, and somehow or other you have to take both of those kinds of normative pressures into account. Now it's interesting to note that while the first four have an enormous amount of empirical support, perceived risk is still somewhat in question. Part of the problem with perceived risk is that just believing that you're at risk for a given illness doesn't necessarily mean you're going to take any protective action. And so there's as much lower correlation between perceptions of risk and whether or not people engage in behavior than any of the other variables.

I think that perceived risk is not an immediate determinative of behavior but is a much more distal variable that will influence behavior, though not in a direct fashion. I would argue that intentions are probably the most important and most immediate determinants of behavior, but we have to recognize that even if an individual holds positive intentions, different factors can prevent him or her from acting upon those intentions.

These factors are skills and ability and environmental constraints: "Look, I intend to do it, but I really don't have the necessary skills, so it's not going to happen." Or, "I intend to do it but there are things in the environment that are preventing me from doing it." You can't use a condom if a country doesn't have condoms. So there are certain environmental constraints that can prevent me from engaging in a given behavior.

But if you formed a strong intention or made a commitment to perform some behavior, and you have the necessary skills and abilities to perform that behavior, and there are no environmental constraints to prevent performance of that behavior, then I would argue there's going to be a very high probability - actually very close to one - that the behavior is going to be performed. But you have to meet all of these conditions.

## **An Integrated Model**

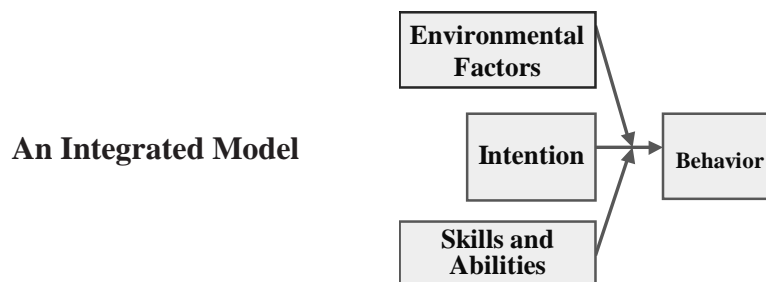
Now I want to start building the model for you. Clearly you're going to need very different interventions if your job is to strengthen intentions rather than if you're trying to help people carry out intentions. All too often we just assume people don't intend to perform an action, so we believe we have to change their attitudes. In many cases people intend to engage in protective behaviors, they're just not able to act on that intention. To get them to act on their intentions requires a different type of intervention than if the problem is that they never formed the intention to engage in the behavior.

So you need different interventions for strengthening intentions than for helping one carry out their intentions. Now if people have formed the intention and aren't acting on it, you're either going to have to work with their skills and abilities or you're going to have to do what we might call environmental engineering. And this is some of the work that's being done: We change the way the bike is made, we change the way seatbelts are made, we change something. Those are important factors.

When people say yeah, I'm going to do that, but they're not, then it could be something in the environment or the way that the equipment is developed. So you need to look at those factors. Behavior change isn't always the answer. Before you go in and start intervening, you really need to find out if people already have the intention. Don't just assume they don't have the intention; don't just assume it's an attitudinal issue. Because if they have the intention, they already have the right attitude. They probably have the right perception of the norms but they're not acting on their intention. What do you have to do?

Give them necessary skills and abilities, or do some social engineering or environmental engineering. Now if they haven't formed the intention, then we have to worry about how we get them to change their intention or to form the intention. And based on what I just described before, there are three critical variables: attitudes, norms, and self-efficacy.

What I said before I want to emphasize now. It's interesting that these different factors are going to take on different weights depending on the behavior you're looking at and the population you're studying. It could be for kids it's all normative while for adults it's attitudinal or it could be for adults, it's self-efficacy and for kids it's attitudinal. You don't know.



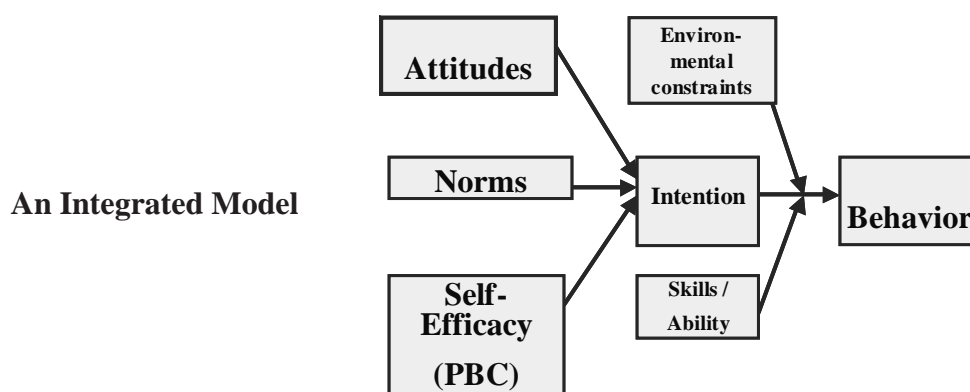
Part of designing interventions is figuring out whether for a given behavior and a given population the behavior is driven by attitudinal, normative or self-efficacy considerations. So you need to keep in mind that again, different interventions are going to be necessary if I'm talking about a behavior that's under attitudinal control or if I'm talking about a behavior that's under normative control, or if I'm talking about a behavior that's under self-efficacy control.

But how do I change attitudes, norms and self-efficacy? Well, the theory goes back and asks, well, what are attitudes? Attitudes are a function of these underlying beliefs that engaging in this behavior leads to positive or negative consequences. If I really believe it's going to lead to more positive than negative consequences, I should have a favorable attitude. If attitudes are important variables, that will lead to a positive intention and if people can act on their intentions, it will lead to behavior.

On the other hand, if it's norms, I have to worry about normative beliefs, not what people in general think, or how much pressure I feel. But what do particular others think? Because I may have to change the beliefs that a particular person thinks I should (or should not) perform the behavior, or I may have to change the perception that people I respect and admire are or are not doing it.

*Different interventions may be necessary to strengthen intentions compared to helping one carry out their intentions.*

And last but not least is self-efficacy or perceived control. As I pointed out, if you look at Aizen's theory of planned behavior, he talks about control beliefs and perceived power. Now it's important to recognize that if you're going to do an intervention, that's the level that we need to intervene at: the level of beliefs. That's what you can change. You provide people with information that if they do this, certain outcomes will happen.



I can provide you with information that certain people think you should or shouldn't engage in this behavior, or I can change your perception of how frequently this behavior occurs. I can change your beliefs that certain barriers are going to be present, or more importantly, I can probably convince you that even if this barrier is present, there's a way to overcome it, to make it easier, not more difficult, for you to engage in a behavior.

*To identify a behavior, it is important to distinguish between goals (preventing injury), behavioral categories (take a preventive action) and specific behaviors (wearing chemical protective gloves).*

Now if that's where the intervention is coming from and this is really what the model is saying, what happened to all these other variables that we've talked about for years? There are personality variables, demographic variables, moods and emotions - what I would argue is that they're all background variables, because they influence what I believe. But if I'm going to intervene, I need to intervene at the level of beliefs, not at these background or more distal variables.

My past behavior is also going to influence what I believe the outcome of engaging in a behavior will be, and it's going to influence what I perceive other people think I should or shouldn't do. If I'm a male, I may have very different beliefs than if I'm a female for some behaviors but not for others. It's not a necessary relationship between these distal variables and any given behavior.

*It is necessary to clearly specify one or more behaviors that, if performed, could truly prevent a specific injury.*

It may help us to know where these beliefs are coming from and we may want to study them, but when you actually intervene, the theories say to intervene at the level of these underlying beliefs. That's what information can do, that's what information provides. It helps you change what people believe. If you change the right beliefs, you should change their attitudes, their perceived norms or their efficacy.

***There are a number of behaviors that can be specified:***  
***\* using seat belts, wearing helmets, wearing protective clothing***  
***\* using car seats***  
***\* installing hand rails, etc.***

There's a whole range of other potential influences on behavior, including intervention exposure and media exposure - there's no guarantee that because you've been exposed to an intervention, you're going to change any of your beliefs. So these are all background factors that we need to study and pay attention to.

How do you apply a model like this? What's involved in actually trying to apply it? There are two aspects of that: One is how do you measure these variables, and even more important, what is it that you're trying to do? When people say, well, we want to study this or do an intervention or change something, I always ask what is it that you want people to do?

One of the most important tasks in developing and using behavioral theory is to define the behavior of interest. But equally important, you have to define the population that you're interested in, because these beliefs about the consequences of engaging the behavior could vary as a function of culture. My perception of who is important could vary as a function of culture or of my demographics and personality.

Once I define the population, I can start trying to figure out what the beliefs are that this population holds. I can sit in my office and I can make up a measure of intentions, attitudes, norms and self-efficacy. But I can't tell you what members of a given population believe the consequences of engaging in a behavior are, I can't tell you who the relevant referents are for people in a given population. I don't know what they see as barriers. I have to go to the population to figure out what those variables are so I can create measures.

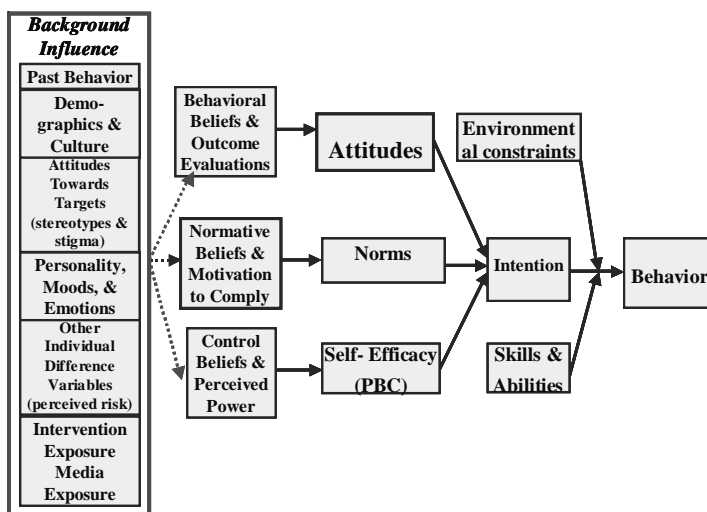
If you're going to do intervention research, you really have to do your homework. You have to go to the population that you're interested in and ask them, what do you see as the outcomes of performing this behavior? What good things would happen if you did this? What bad things would happen if you did this? What's the behavior you're trying to change?

Once you specify the behavior, other things start to fall into place. Who would approve or disapprove of you doing it? You're starting to get to the norms. Who do you know who does this, and who do you know that doesn't do it? What makes it easy for you to do this, what makes it hard for you to do this? I don't know what those answers are going to be when I go to an African American community or when I go to a Latino community or when I go to a poor rural community. I can't sit in my office and do that.

But all too often people making up interventions decide they know what people believe or what's important because that's what they think. That's why most interventions fail. You don't do

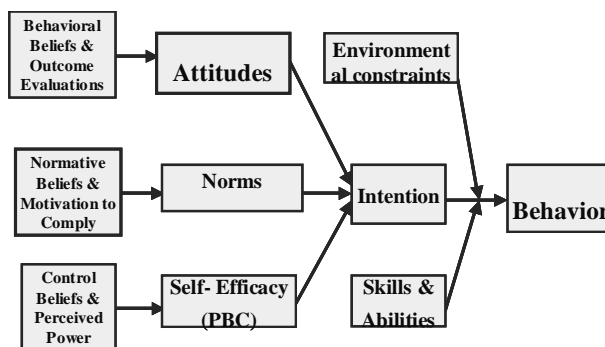
your homework, you don't figure out what the critical variables are, and how these differ as you move from one population to another. Again, you need to both define the behavior and the population.

**An Integrated Model**



And let me point out that identifying the behavior isn't as simple as it often appears. Among other things, it really is necessary to distinguish between goals, behavioral categories and behaviors. You want to prevent injuries, but that's not a behavior, it's an outcome. If you really did prevent injury, you would have an outcome on your hands, not a behavior.

**An Integrated Model**



You want to tell people to take preventive action, but what does that mean? What do you want them to do: You have to get down to a specific behavior. For example, wear chemical protective gloves. When? It's necessary to clearly specify, and in the injury prevention area, you really have to sit down and specify one or more behaviors that if performed, could truly prevent a specific injury or some type of injury.

So one of your real jobs is to say well, what is the behavior that I want these people to do? How can I define this behavior? Now, as we've already heard, there are lots of behaviors. And they can be specified. We can get down to the level of behavior wearing seatbelts, protective helmets, protective clothing, using car seats, installing handrails so there are a lot of behaviors that you can start thinking about and defining and then start trying to apply this kind of model.

**Action, Target, Context, Time**



This is an attempt to measure past behavior. If I know that six months from now I'm going to be asking people this question, then what's the intention that's relevant? The intention has to correspond - their intention to always use chemical protective gloves when they're handling herbicides in the next six months or in the next year. The question of correspondence is critical. Once I've defined the behavior, all the other measures start to fall into place.

## Behavior Measures

**Behavior Measures**

**In the past N months, how often did you perform behavior X (e.g., wear chemical protective gloves when you were handling herbicides)?**

Never    Seldom    Sometimes    About half the time    Most of the time    Almost All the time    All the time

I have to start out with my measure of behavior. First there's the behavioral measure and the general question. If you're trying to assess behavior, it's in the past however many months or years, how often did you perform behavior X? I'll stay with this example for a little bit.

How often did you wear chemical protective gloves when you're handling herbicides? Got more points on the scale, it doesn't matter, figure out what's really relevant for your population and with kids - 5 point scales are probably more than sufficient. For adults, 7 point or 9 point; it depends again how much variation you're trying to get. So this depends on your understanding of the population.

Let me just make it clear that a behavioral criterion can be defined at any level of specificity - I can talk about doing something in a given context, or I can talk about doing something in general. I can talk about smoking a particular brand of cigarettes, or I could talk about smoking cigarettes - I'm just varying the level of specificity. It doesn't matter. You have to define the behavior at whatever level of specificity you deem relevant.

But once you've defined it, then as I said before, all other variables must correspond and be compatible with the measure of behavior. So, whatever you define as your behavior, whatever you're trying to predict, whatever you're going to assess six months from now - then everything else has to ask: How likely is it you're going to do this, is doing this a good thing or a bad thing, what are the social norms concerning doing this, how much self-efficacy do you have or control do you have over doing this, do you believe that doing this will lead to certain outcomes?

## Intention Measures

We'll walk through this a little bit more. The intention measure, very simple and straightforward: What's the likelihood you'll perform behavior X, and, again, behavior X has to be defined so it corresponds with the behavior. So how likely is it you'll perform behavior X, or I will perform behavior X, do you agree or disagree? The exact nature of the scale isn't as important as making sure that the behavior is well defined and that it's consistent.

**Intention Measures**

**What is the likelihood that you will perform behavior X  
(e.g., always wear chemical protective gloves when you  
are handling herbicides, in the next N months)?**

Unlikely \_\_\_\_\_ Likely

So we can measure intentions fairly simply. I can use more items, or I can change the time frame to tomorrow. For example, how likely is it you'll wear protective gloves the next time you use herbicides as opposed to always use it in the next six months. You have to decide on your time frame, the behavior, what your criterion's going to be in terms of whether you had a successful intervention. Again, once you've defined your behavior, everything else follows.

## Attitude Measures

**Attitude - Direct Measure**  
N Semantic Differential Items

**My performing behavior X is:**

Bad \_\_\_\_\_ Good  
extremely quite slightly neither slightly quite extremely

Pleasant \_\_\_\_\_ Unpleasant  
extremely quite slightly neither slightly quite extremely

We can measure attitude directly and the most common way of doing this is with semantic differential which is a seven-point bipolar scale typically. Again, it's my performing behavior X: My always using chemical protective gloves when handling herbicides in the next six months? The behavior has to stay the same. Is it good or bad, is it pleasant or unpleasant, is it wise or foolish? There are a number of different scales that you can use; you're trying to assess your overall feeling of favorableness or unfavorableness to performing this behavior. That's all an attitude is.

When you measure attitude using any traditional scale - Thurstone scales, Likert scales,

Gutman scales, semantic differential - you arrive at a single number and that number says how favorable or unfavorable you are to the object. When you're trying to talk about behavioral interventions, the object is the behavior you're interested in, so is this good or bad, pleasant or unpleasant? So you can measure it fairly directly; it's fairly simple to do.

And again you can sit in your office and do this, you can make these scales up. But the indirect measure of attitude, and where this attitude comes from, are based on beliefs and evaluations - measures have been used for a long time. My performing behavior X always using chemical protective gloves when I'm handling herbicides in the next six months - will lead to my hands getting too hot. Is that likely or unlikely? I don't know what the consequences are for a given behavior in a given population. I have to go and find out from them and then I can plug in whatever consequences they give me.

In most cases I don't have to evaluate whether my hands getting too hot is a bad thing. That the gloves protect me from chemical burns is a good thing. But there are times when you don't know whether the outcome is positive or negative. One of the things that surprised me when I was working in the STD/HIV area concerned whether, reducing intimacy with condom use is a bad thing. It's not if you're a commercial sex worker. They want to reduce intimacy, and so their belief that using condoms reduces intimacy is a good thing, not a bad thing. You can't always take the evaluation of outcomes for granted. Preventing pregnancy, depends on whether you want to have a kid or not. Preventing pregnancy can be good or bad.

So sometimes we don't really know what the evaluation is, so you do have to pay attention. You can measure it when you're uncertain or think that there might be some problems.

**Attitude -Indirect Measure**  
N behavioral beliefs

Belief:

**My performing behavior X will lead to consequence (or outcome) Y:**

Unlikely \_\_\_\_\_ Likely  
extremely quite slightly neither slightly quite extremely

Evaluation:

**Consequence (or outcome) Y is:**

Bad \_\_\_\_\_ Good  
extremely quite slightly neither slightly quite extremely

## Subjective Norms

To directly measure of the subjective norm, one can ask whether most people who are important think I should perform behavior X, is it likely or unlikely? Alternatively one could ask

whether most people who are important to me think I should versus I should not perform behavior X. Again, most of these measures have been used in literally hundreds of studies. They're very reliable, and when appropriately measured you get all these nice correlations that the theories say you should get. It's not that hard to do this kind of research before you develop an intervention. The behavioral norm, again, what we're asking is not do people think you should do it but what are these people doing, This is just a totally different way of trying to ask that question.

**Subjective Norm - Direct Measure**

**Most people who are important to me think I should perform behavior X**

Unlikely \_\_\_\_\_ Likely  
 extremely    quite    slightly    neither    slightly    quite    extremely

Like attitude, norms are based on underlying beliefs. Here the beliefs are about specific referents — My best friend thinks I should perform behavior X and in general I want to do what my best friend thinks I should do. And for the behavioral norm, how often does your best friend perform behavior X and in general do you want to do what your best friend does. You could change that and ask, in general do you want to be like your best friend? How much do you want to be like him, how much do you want to behave like him?

**Behavioral Norm (Direct Measure)**

Think of the people who are most important to you. How many of them do you think have performed behavior X? If you're not sure, make your best guess.

None.....1  
 A few.....2  
 Some.....3  
 Most.....4  
 All.....5

**Perceived Control**

Perceived control is typically measured very simply. My performing behavior X is up to me/ not up to me; it's under my control/it's not under my control - it's a semantic differential. You're using different endpoints on the semantic differential to assess perceived control.

## Perceived Control - Direct Measure

N Semantic Differential Items

**My performing behavior X is:**

Up to me	_____	_____	_____	_____	_____	_____	_____	Not up to me
	extremely	quite	slightly	neither	slightly	quite	extremely	
Under my control	_____	_____	_____	_____	_____	_____	_____	Not under my control
	extremely	quite	slightly	neither	slightly	quite	extremely	

For indirect measures, if you've identified certain things that people say make it difficult or easy for them to engage in a behavior, you can ask, if this environmental or situational factor was present, would it make easy or difficult for you to perform behavior X? Then how often is this factor present when you try to perform it? Self-efficacy is a little bit different. What Bandura argues is that you really need a scale that looks at barriers, and these barriers should be graded in difficulty.

## Perceived Control - Indirect Measure

**Control Belief:**

**Would [environmental or situational factor A] make it easy or difficult for you to perform behavior X?**

Easy	_____	_____	_____	_____	_____	_____	_____	Difficult
	extremely	quite	slightly	neither	slightly	quite	extremely	

**Frequency of Event:**

**How often is [environmental or situational factor A] present when you try to perform behavior X?**

0 of 10 times    1    2    3    4    5    6    7    8    9    10 of 10 times

So you want barriers that go from fairly easy to overcome to difficult and you ask the person if this barrier were present, how certain are you that you could perform behavior X? Even if this is happening, how certain are you that you could carry out the behavior? There is still some real question about whether this is giving you the same information or different information in perceived control.

There are some studies that find high correlation between self-efficacy and perceived control, and there are other studies that find less correlation between them - it may have to do with the behavioral domain, but we don't have an answer to it. What I would recommend is, if you're really concerned about this, you'd probably want to measure both perceived control and efficacy at the same time and then look to see what's going on.

## Lessons Learned

Now, I've just run through all of the critical measures that are in the model, from behavior to intention to attitudes, norms, and efficacy, and then back a step to what the underlying beliefs are. So it's fairly simple to do this, again the critical thing is to define your behavior and then everything follows from it. If you're interested in demographic differences, measure demographics. If you want gender, if you want age, if you want socioeconomic status, if you're interested in personality variables - by all means, measure them.

The theory doesn't say you shouldn't be looking at these factors, it's just saying that's not where you want to intervene. Knowing that men and women have different beliefs might help you decide how you'd go about changing the beliefs that are critical. Maybe you only have to change them for men and not women, or women and not men, and that would tell you something. But if you go get these measures, first you're going to know whether people have formed intentions to perform the behavior but aren't acting on them, or if they haven't formed injury prevention intentions. And again I would argue this is really critical.

We all too often just decide that we need to change something, and we develop interventions. We never recognize that people already held the intentions, they're just not acting on them. They can't act for some reason, and it's really our job to help them act on them. This means developing a very different kind of intervention, be it skills and abilities training or some kind of environmental engineering.

On the other hand, if in fact you find that people just don't intend to do this, or have very low intentions, so it's unlikely they're going to do this, then you're also going to be able to know whether these intentions are primarily determined by attitudinal, normative or self-efficacy considerations. And that's important, because once more you're going to have very different interventions. If you're trying to change people's perceptions of the norms. you're doing something very different than if you're trying to change their attitudes, or if you're trying to convince them that they really could do it if they wanted to.

Equally important, if you went back to the level before, you would actually be able to identify specific behavioral normative or control beliefs that discriminate between those who do and those who don't perform or intend to perform the behavior. And, I can look at people who perform or not perform and look at any belief and see if there's a difference is there really a difference in my belief that if I do this it's going to protect me from injury? It could be one of the outcomes - if I do this it's going to prevent chemical burns.

If both people who use it and don't use it agree, that's not anything you want to start intervening on or trying to change. If you found out that people who use gloves say, yes, it's going to protect me, and people who don't say, no, it's not going to protect me, then you know you want to start increasing the belief in people who don't intend to perform the behavior. But in many cases you're going to find that things that you think you need to change don't need to be changed, people already believe some of these things.

You have to try to find out what are the beliefs that are really discriminating between people

who do and people who don't perform the behavior, or people who intend and don't intend to perform the behavior. Because that should be the focus of your intervention: It's changing those beliefs that are really discriminating between the users and non-users, between the people who behave and people who don't behave. And you can identify those beliefs and those then should serve as the targets for your intervention.

So what can I say we've learned from behavioral science theory research? First of all, it's very clear that behavior can be changed. They used to say that behavior was difficult or impossible to change. I remember when we first started working in the STD/HIV area, particularly HIV, the question was, how are you going to change sexual behaviors? Well, there have been enormous changes in sexual behavior in this country. And we actually have some evidence that some specific interventions have led to those changes.

In the beginning there were a lot of changes we couldn't tie it to any intervention, but there have now been enough studies that show you can change behaviors that people thought were difficult or impossible to change. It's not impossible. And I think you really have to take that mindset with you - I can change behavior. If I do the right thing. If I do my homework and figure out what is the determinant or what are the determinants of that particular behavior.

Second, I think contrary to a lot of popular belief, there's really abundant evidence that information in and of itself can produce behavior change. I don't know how many of you have read that information in and of itself is insufficient to produce behavior change. It depends on what you mean by information. If I tell you about a particular type of injury and how you get it and all its consequences and how it progresses and gets worse, that's not going to have any effect on behavior. That information about a disease and how it's spread is irrelevant to whether or not you perform the behavior.

What's the information I need? I need information that shows that if I perform this recommended behavior, certain things will happen and hopefully you're going to convince me that they're good things that'll happen, not bad things. I need information that people I respect and admire think I should do this. Or that most people I respect and admire are already doing it.

And I need information about how to overcome barriers. When I say I can't do it because of X, how do I get around X? So information that's directed at the variables that are driving the behavior is going to be necessary and sufficient to produce behavior change. Again, what theory can do is say these are the beliefs you have to change, this is the information you have to give.

I don't know of any theory yet that says well, this is the best way to make sure that people accept this information. I can tell you anything, there's no guarantee you're going to believe it. That's a whole other area. And that's the communication and persuasion area as opposed to the behavior change area. The behavior change area helps us to identify the beliefs that are critical to behavioral performance (or non performance).

### ***Lessons Learned***

- \* Behavior can be changed.***
- \* Information can produce behavior change.***
- \* Effective interventions are directed at changing specific behaviors.***

But behavior theory doesn't tell you how to change these beliefs, with one possible exception. Bandura does talk about how to increase self-efficacy: Through modeling behaviors, through other kinds of things. There are all kind of things in communication persuasion that also tell you how you can increase the likelihood that people accept certain kind of messages, and there are various parts of production values that can increase things. There's a whole series of things being done now with people who are called high and low sensation seekers. And you need a different kind of message to attract high sensation seekers and low sensation seekers.

But that's getting us a little bit too far off the topic of today. Now the third thing we've learned is that the most effective interventions will be those directed at changing specific behaviors. Trying to change people's intentions to reach goals doesn't mean anything. I'm going to try to prevent injury, but what do I have to do? If the intervention doesn't tell me what to do, it's not likely to have any effect. Or, saying that I'm going to take preventive behavior, doesn't mean very much. I can change your intention, but if I'm going to be effective, I'd better identify a behavior that I think is really going to make a difference and then focus on that behavior and try to change it.

If there are two behaviors, we can deal with that. If you get beyond two or three, the message is going to be so different and so complicated that it's going to lose its effectiveness. So, part of your job again, is to decide what it is you're trying to get people to do, what is it that you think that if they did would really make a difference and reduce the likelihood of some kind of injury, and can you specify that clearly and then figure out why some people are performing that behavior and why some aren't, and design an intervention to allow you to do that?

Fourth, there's a growing recognition that there are really only a limited number of variables that need to be considered in attempts to influence or maintain any given behavior. One of those background variables or distal variables is perceived risk. That is, if I perceive I'm at risk, I may have very different beliefs about the consequence of taking this protective behavior than if I don't. But I may not. And perceived risk is tricky. There's a real difference between wondering how likely is it I'm going to get some kind of injury or that I'm going to acquire a certain kind of disease as opposed to what we call behavior specific risk. How likely is it, if I don't perform this behavior, that I'm going to get this illness or this disease?

**Lessons Learned cont.**

- \* A limited number of variables need to be considered to influence or maintain any given behavior.**
- \* Relative importance of variables as determinants of intentions and behavior depends upon the behavior and population under consideration.**
- \* Substantive content of variables may change as a function of the behavior and population under consideration.**

## Strategies for Intervention Development

Again, we know that the relative importance of these variables as determinants of intention and behavior depends on the behavior in a population. So, an intervention that works in population A for behavior A may not work in population B because in population A it could be attitudinally driven and population B it could be normatively driven. You need to do your homework.

The substantive content of these variables may also change as a function of behavior in a population. I can measure the attitudes the same way, so it may be that for one population it's attitude, for the other it's norms, but I know how to measure attitudes. But what are the beliefs that underlie the attitude? Those substantive beliefs - what people see as outcomes - can also vary depending upon the behavior and the population that I'm looking at.

So prior to developing any kind of assessment tool before going out and trying to figure out what's driving this behavior in the population, you really need to do formative qualitative research that utilizes standard elicitation procedures. That gives you your underlying behavioral, normative and efficacy kinds of beliefs. Then you can then build an instrument and try to get some more quantitative data.

If you're going to develop an intervention then you really have to know your target population, you have to identify and clearly define the behavior you want to change or reinforce, and you really need to conduct formative research to identify the salient behavioral normative and control or efficacy beliefs. You want to use as much data as you can from this formative research to develop some kind of fixed-alternative questionnaire.

You don't need big samples. The elicitation research we're talking about may require 30 people if you've got a homogenous population. As the population becomes more heterogeneous, you need to add more bodies. The elicitation research asks, what are good and bad things that would happen? With 30 people you're going to find out what is a common for this particular population. Who are the important others who would support or oppose them, what makes it easy or difficult? And then you can do fixed-alternative questionnaires.

Then, if you use data from this kind of research - whether you can go into more quantitatively as opposed to strictly qualitatively - the more you can do, the more likely it is that you're going to design an effective intervention. But having these data will allow you to determine which variables need to be addressed in an intervention and more important, to identify the particular behavioral or normative or control beliefs that need to be addressed in order to produce change and to reinforce the behavior of interest. Then you need to develop messages or create other strategies to change those beliefs.

And last but not least, pretest your intervention. I wouldn't sit in the basement and mix up some chemicals, say I have a vaccine and go out and start using it. But people sit in a basement and make up an intervention and go out and start using it. It ain't going to work. You really have

to pay some attention to what you're doing, you need to pretest your interventions this is not something you can just throw together.

You have to make sure that people understand what you're telling them. You have to make sure that they're accepting what you're telling them. If they're not accepting it, go back to the drawing board. That means developing a different message or strategy. You just can't assume that I'm going to take something out there and do it.

### ***Strategy for Intervention Development***

1. Know your target population.
2. Identify and clearly define the behavior you want to change or reinforce.
3. Conduct formative research to identify salient behavioral, normative and control (efficacy) beliefs.
4. Use data obtained from formative research to develop a fixed-alternative questionnaire.
5. Develop messages or other strategies to change those beliefs.
6. Pretest the intervention!!!

# Brief Behavioral Interventions To Prevent Injury

Chris Dunn, Ph.D.

I would like to start by thanking all of you for attending the conference today. In the next 30 minutes, I will discuss two main points, 1) describe two specific behavior interventions and their outcomes to reduce injury risk and 2) describe the brief intervention used in these trials. I will describe some of the successes in using brief behavioral interventions and how exciting it was to take this theoretical approach and apply it to a practical setting. Both of these randomized control trials were conducted at Harborview Medical Center.

## *Brief Behavioral Interventions to Prevent Injury*

**Chris Dunn PhD**  
**UW Psychiatry & Behavioral Sciences**  
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### *Brief Interventions*

- *Discuss two outcome studies @ HMC*
- *Describe the brief interventions*

The term “brief intervention” is used to describe an empirical application of a technique that has been applied for thousands of years. Simple, it is when people try to help each other by talking. But it’s a bit more than that...These brief sessions are carefully crafted treatment interventions that include many different styles of counseling and have evidence for their effectiveness in causing behavior change.

### *Brief Interventions*

- *A talking treatment used to reduce risky behaviors and their consequences.*
- *Carefully crafted from research findings*
- *Many different styles*
- *Patient-centered style described in this talk*

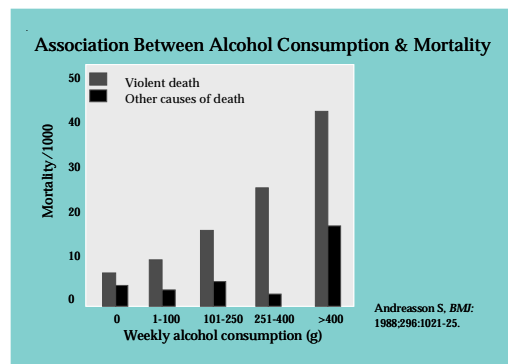
The variables predicted by theory to cause change aren’t always the “active ingredients” in behavioral counseling. In my area of research we listen to audio tapes of counseling sessions. We study different styles of “talk” that occur and we analyze the conversations to see if anything predicts behavior change. We work to focus the analysis on the in-session variables. For example, if someone’s confidence (self-efficacy) improves during counseling or their skills improve when cognitive behavior therapy is used with an alcoholic patient, is that a predictor of sobriety? In this example it does not. Skills can go up but people can be drunk a year later. Skills like drink refusal skills do not go up and people are sober, so we do not feel we quite have a handle on the true answer. The very variables predicted to cause change by Cognitive Behavioral theory (efficacy and skills) have shown at best mixed results with alcoholics. But Cognitive behavior therapy (CBT) works very well nonetheless. I want to talk to you today about an evidence-based counseling style called Motivational Interviewing (MI).

## Motivational Interviewing (MI)

MI was developed by Dr. William Miller, a Regents Professor of Psychology and Psychiatry at the University of New Mexico and Director of Research for UNM's Center on Alcoholism, Substance Abuse, and Addictions. Dr. Miller began by developing the method of motivational interviewing while teaching his students. They watched him work and Socratically asked him what he was doing, forcing him to articulate what eventually crystallized into Motivational Interviewing (MI). Since then, the technique has been widely evaluated and is almost the treatment of choice in behavior change interventions. The National Institutes of Health currently funding 75 studies involving the use of MI, and over 40 are already published.

## Association Between Alcohol Consumption and Mortality

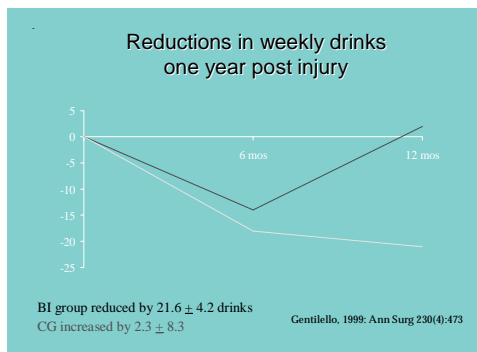
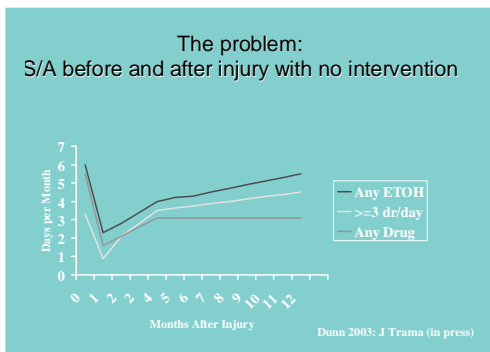
Alcohol may not be the greatest precursor of injury, but it's a big one. The problem is, although an injury event is an epiphany for substance abusers, epiphanies don't always last. We conducted a study of this phenomenon with Douglas Zatzick, MD, Associate Professor, Psychiatry & Behavioral Sciences, at the University of Washington, and Harborview Medical Center, who was the principal investigator. The sample included 100 randomly selected trauma patients who had been injured and admitted to the trauma center at the UC Davis



Medical Center. We interviewed patients at baseline and asked them questions like;

- how many days a week do you drink alcohol?
- how many days a month do you drink three or more drinks on one occasion?
- how many days a month do you use any drugs?

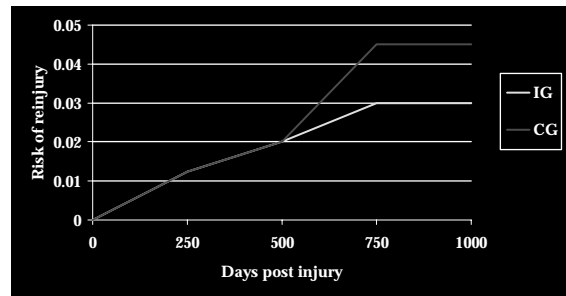
We found that when patients do not receive any brief intervention counseling in the trauma center that alcohol and drug use declined dramatically from one to three months after injury, but then came right back up to pre-injury levels by from six to 12 months after injury.



And that is a recurrent finding. At Harborview Medical Center, we found earlier in our randomized trial comparing the effects of a brief motivational bedside intervention with usual trauma care for people who had been injured and also had alcohol problems. This sample included drinkers with alcohol problems from very mild to very severe. Several months after their injury, the control group had greatly reduced their number of weekly drinks, and the intervention group had reduced

their weekly drinks also. At that point, we thought that the intervention hadn't done anything. The injury just knocked the stuffing out of everyone, and both groups drank less, we thought. But as time progressed, the intervention group continued to reduce their drinking up to the one-year point, while the intervention group's drinking climbed back up to pre-injury levels. That was self-report data. In terms of objectively measured re-injury rates measured by hospital records of those coming back to an ER in the state of Washington with an alcohol related injury or being admitted for another injury – the intervention reduced the re-injury rate for up to three years, by 47 percent, cutting the small but expensive re-injury rate in half.

### Reinjury rates reduced 47% over 3 years



Gentilello, 1999: Ann Surg 230(4):473

So we then implemented brief bedside interventions as a daily service at Harborview's trauma center, and a few years later Dr. Brian Johnston, MD, MPH, (Chief of Service, Pediatrics at HMC and Assistant Professor, Pediatrics, UW) and Frederick P. Rivara, MD, MPH, (Professor, Pediatrics at U of W, Founder, Harborview Injury Prevention and Research Center), launched another brief intervention trial addressing multiple behaviors, this time with adolescents right in the emergency room at Harborview. This is one of the first motivational interviewing studies to look at improving a cluster of 6 behaviors: not wearing seatbelts, not wearing bicycle helmets, carrying weapons, binge drinking, riding with a drinking driver, or driving after drinking. We had about 300 subjects in each group and we trained four social workers to do motivational interviewing to address these high-risk behaviors. It was so loud in the ER that when we tried to audiotape the interviews, we found that it was all but impossible: We did a six month follow-up and found that we were successful with increasing seatbelt and bike helmets usage among youth. It doesn't look like we did much for the other behaviors, including the alcohol behaviors or weapon carrying. Some of these behaviors, like snapping on a seatbelt or putting on a bike helmet, demand less of a change in lifestyle for a 16 year old than would shifting from eight Budweisers on Saturday night to Pepsi, while in the presence of his peers. We're not sure if that's why we didn't make much impact with the other behaviors, but I think we were also a bit underpowered to detect change there.

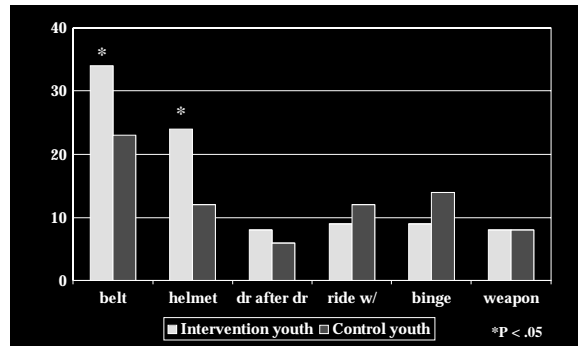
### Youth Injury Prevention study in Harborview's ED

- 312 youth got standard injury care
- 318 got 20 minute bedside interventions
- Targeted seatbelts, helmets, weapons, binge, ride w/, ride after drinking
  - 6-month follow-up...

Johnston et al., 2002:Pediatrics 110(2):267

This was the most rigorous and conservative statistical analysis I've ever seen done. So we were pretty encouraged that if we just fired up a service at Harborview addressing only seatbelts and bike helmets by screening and intervening, that we would be even more effective in preventing injury than this study was.

% Improved in Target Behaviors at 6 Months:



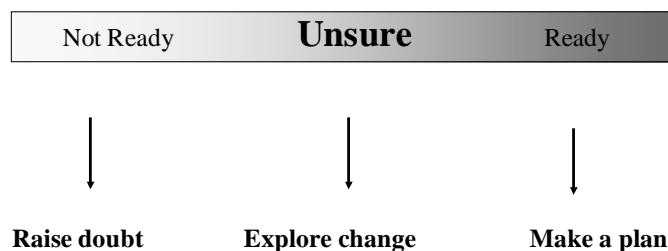
## Change Talk

We have touched on the stages of change behavior, and motivational interviewing certainly embraces that model. But if you summarize those stages, they don't really tell you anything about *why* people change.

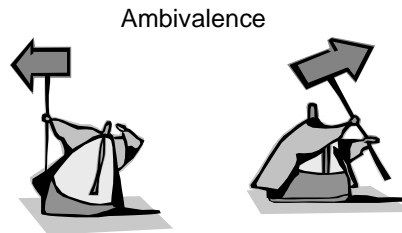
One value of this Transtheoretical Model of Change is that it does miracles, literally miracles, for clinicians. They are the ones who talk to people who are doing stuff that's killing them and who are not ready to change. They get discouraged. I cannot tell you how many clinicians that I've been lucky enough to train who say, *"I like the stages of change model because it reminds me that when someone's not all ready, then I'm not responsible to make them change. I can let go. You know, I had a good conversation, rapport is good, I've maybe raised some doubt, I talked hypothetically about change with someone not ready to change yet."* If you've got what you think is a pre-contemplater, somebody not ready, you're not falling short ethically if they don't change immediately, nor is the encounter a failure. An exploratory discussion about why one *might* change is valuable unto itself.

*How Do People Change Their Behavior?*

## Stages of Change Simplified:



I don't know if this sounds even stranger to you than physics might have sounded to you in high school...but remember back in high school when the teacher told us that every time you push against the wall, it pushes back with an equal and opposite reaction? Did you ever have trouble buying that? Well, it's also true of counseling. If you take the pro-change side of the argument, you will do very well at generating the other side of that person's view. You can call it denial or resistance or whatever, but it's really nothing but the other side (the anti-change side) of that person being forced to exert or express itself.



An internal argument...

In the case of smokers, they usually think it's very *important* to change, right? How could you not think that as a smoker in this day and age? But they're not really *confident*, because they've tried to quit and relapsed a bunch of times. So they're less ready due to low confidence rather than due to low importance. So we found that the words "importance" and "confidence" are clinically very useful.



I'll just share that on a process level, if you listen to tapes of counseling and analyze them and train a group of really bright undergraduates to code them—which is incredibly laborious, but counseling psychologists must find a way to earn their keep—you may find as Paul Amrhein recently did, that a certain kind of talk is predictive of healthy change up to one year later! We're really tantalized by this finding. He found that a year later, *the strength of commitment talk* during a single counseling session predicted drug use or abstinence. The stronger the change talk toward the end of that session, the less drug use a year later. And just the opposite occurred for the weaker, the more vapid change talk. By "change talk", I mean commitment talk.

\*An in-session predictor of change is  
"change talk"

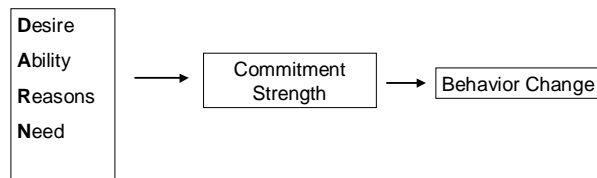
Desire to have things be different  
Ability to be able to change  
Reasons for changing  
Need for change to happen

\*It's the strength of commitment language that predicts change

## Commitment Talk

**Change talk** is very different from **commitment talk**. For example, if someone says, “*I have a desire for things to change; I really don’t want to come back to this emergency room with another injury; I need to change and there’s lots of reasons why I should buckle my seatbelt from now on.*”—those are examples of **change** talk indicating a desire and ability to change and even reasons in favor of changing. But the commitment is not yet there in his words. **Commitment** talk—the talk that really predicts change—is things like, “*I’m going to wear my seatbelt from now on, every single time I get in the car.*” That’s the way you want a kid to talk in the emergency room and you want to support that kind of talk, that’s the pro-change side of their ambivalence.

The strength of commitment talk  
during the encounter:



So, in order to facilitate **commitment** talk, we might ask, “*You don’t like the way things are, you want to change, you know you can, you think it’s important - where does this leave you now?*” What you get next gives you an accurate readiness assessment. They may say, “*Well, I know I should, but I’m just not ready*”, or they might say, “*I’m going to do it*”. When it comes time to cut the new car deal the salesman might hear, “*Well, I’m going to go home and talk to my wife about it*”, or “*I want this car, but I’ve got to check with my wife first*” or “*I’ll take it, how much?*” Each statement becomes a little stronger in the commitment department.

So the idea is to get people to talk in a certain way because you can’t control whether they’re in a gang or not when you’re talking to them in the emergency room - all you’re doing is talking. You can have a little influence over **how they talk**, and you want them to fortify the pro-change side of their internal argument.

If you walk up to the youth and say, “*I’m really concerned that you’re injured, because you told me that you never wear a seatbelt and you are likely to get hurt and have to come back here again,*” the kid will probably say, “*No, I’ll never go through this again, I’ll just drive more carefully next time*”.

So it’s ready, aim, fire rather than ready, fire, aim. The logic is that if someone argues for change, that predicts change. If someone argues against change, that’s more strongly predicts no change. So if you’re intervening with someone and they’re doing nothing but arguing against change by using negative, “anti-change” talk, you could almost argue that to do no harm, you should shut it down and stop on good terms.

If the provider argues for change, an equal, opposing reaction occurs and a style of confronting instead of understanding emerges. This is easy to prove! It may even be the only predictable thing about human behavior. If you push somebody to change something they’re not quite ready

to change, you'll cause them to argue against change. "Chuck, you know you're drinking too much, you got to give it up..." "Oh, don't keep telling me that, you know I don't have a problem..." And it happens in the short space of a single sentence; it's really predictable!

But you can prevent that. Just by using micro skills. People are very responsive in how they talk, depending upon who they're talking to.

**Keys to change**

- **Patient arguing for change predicts change**
- **Patient arguing against change predicts no change**
- **If provider argues for change, the patient will argue against it.**
- **Confronting increases arguments against change**
- **Understanding increases arguments for change**

**(therefore, talking style is important)**

**Wrestling or Dancing**

So, one can think of two contrasting styles. Beginning interviewers can clearly tell you at the end of an interview if it was more like **wrestling or dancing**. They know that already; they don't need training to discern that; they can easily tell dancing from wrestling. As an example, when you're pressed for time, you might ask only about the quantity or frequency of the behavior: How often do you put your seatbelt on or what are the conditions when you do wear your seatbelt and when you don't? If the kid's not interested or thinks that you're trying to close the deal, it becomes wrestling.

**Two contrasting styles of talking to people...**

And people are not used to exploring something without being pushed to change, because most people in the world who care about them just try to persuade them to change without really listening to them. So they've had lots of practice and see it coming when you try to persuade them to change again. They launch these preemptive strikes early on to block your persuasive efforts. If you've got two minutes, you're just wasting it by asking about the frequency and quantity of their drinking. If you're already concerned about their drinking, why not instead just see if they want to change, and if so, how badly? So telling them why they should change and then advising them to take action is a different style from broaching the topic slowly, exploring their view - tell me what you think about this, and then I want to give you my information and advice, as well as hear yours. Think about it, talk about it, try it.

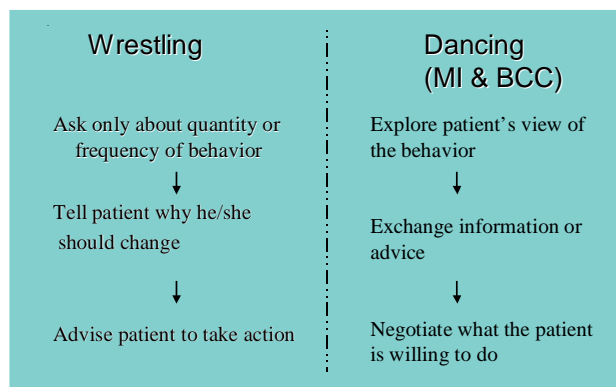
**Wrestling or Dancing?**



Wrestling.....Dancing

## Behavior Change Counseling

So there's this thing called motivational interviewing, and then there's behavior change counseling which is derived from motivational interviewing and designed for the medical setting. As generic as "Behavior Change Counseling" sounds, it's really a specific adaptation of MI developed by Steve Rollnick, and you don't need a psychotherapy background to learn it or do it. It takes less time to learn than MI and works really well in medical settings which is where it was created. When we worked with the kids in the emergency room, raising the topic and getting going was the hardest part of Behavior Change Counseling. We did this by offering them a menu of risky behaviors to discuss, encouraging them to talk about the one most important *to* them, not to us. Eliciting and then summarizing their views goes a long, long way, and what you're doing is you're greasing the skids for cutting the deal. First, we provided information to change to raise the importance in their minds of making a change, or to raise their confidence that they could successfully make a change. That's why we give information to change behaviors, to help change attitude, partially, and to help people get the rest of the picture. I find that when I do this and slow down, and then when I deliver my punchline, it sinks in or it's at least listened to and considered seriously. This is after I've first listened to them and considered their viewpoint seriously, however erroneous I might think it is.



When discussing action options, it's almost like you're shifting into a different phase and beware, don't get too far ahead of them. Accept that change happens slowly, whether you believe in the stages or not, I think everybody agrees that change happens slowly. So it's not very likely that they're going to walk out of the emergency room a changed kid. And remember to close on good terms so that in our public health system, when someone brings this topic up again with the same kid in a different context, the kid's not going to open up so defensively like he's facing an adversarial chess opponent. So those are some of the ways we try to dance and not wrestle with patients.

### Motivational Interviewing:

- Patient-centered & directive style of counseling
- Prepares people for change
- Targets "Why" rather than "How" of change
- Requires training in advanced counseling skills
- Has an effective adaptation for medical settings: "Behavior Change Counseling"

Rollnick, Mason & Burler, 1999

### Behavior Change Counseling (BCC)

- An adaptation of Motivational Interviewing
- No psychotherapy background needed
- Takes less time to do
- Takes less time to learn
- Developed in medical settings for medical providers
- Works in medical settings

Rollnick, Mason & Burler, 1999

#### **One-session model of BCC**

- **Raising the topic and getting going**
  - **Eliciting the person's view on this topic**
  - **Summarizing the person's view**
  - **Exchanging information using the Elicit-Provide-Elicit method (E-P-E)**
- 

- **Discussing action options and giving advice using (E-P-E)**
- **Closing on good terms**

## **Raising the Topic and Getting Going**

But just some details about our study with emergency room youth... When we went to the kids in the ER, our interventionist had already screened them so they knew a bit about what their risk behaviors were. The interventionist would set the stage and make the obvious explicit: These are the two skills that we teach people in this hospital to do, to develop instant rapport. I don't know how else to do it. Making the obvious explicit means saying things like, "*Gee, you don't look too eager to keep talking about this topic...*" This approach helps diffuse resistance and recruits the kid to get back into the discussion.

#### **Raising the topic and getting going (the hardest part)**

- **"Set the stage" and "Make the obvious explicit"**
- **Link your topic to person's primary concern**
- **Give individualized feedback**
- **Hitting early resistance:**
  - *it's normal*
  - *just listen and summarize*
  - *then move ahead*

You say I'm not here to try to change your life, in so many words. And you get their buy-in to discuss something: "*I'd like to talk to you about some of these risky behaviors that could really play a big part in whether you get hurt again. Would that be okay?*" A lot of social psych literature says that when the homemaker answers the door and there's a Kirby vacuum salesman on the porch, if the homemaker sees themselves letting the Kirby vacuum salesman in, agreeing to dance, so to speak, they're more likely to buy a vacuum cleaner.

So you see yourself agreeing to talk about this topic. And you make the obvious explicit, you say "*Gee, I didn't hit on your most favorite topic, did I?*" If the reply is, "*Yeah, well...*" then boom, you're in, you got rapport, you've told them you're not going to push them, and off you go.

We also use individualized feedback to raise the importance of changing. "*Here's the six things we asked you about, we got really good news on four of these things, you're quite a bit safer than the average bear out there when it comes to these four things. But I was concerned about the fact that you say you drink a lot on certain occasions and the fact that you don't wear your seatbelt all the time, I wonder if we could talk about that.*"

Often, we hit early resistance. In the case of drinkers you know what that means: *“I don’t have a problem, I can drink more than other people, I go to work every day.”* Resistance is a natural reaction that people have to a stranger trying to change their lives, and some of these things, maybe not with seatbelts, but bingeing and carrying a weapon, these are pretty darn personal and have to do with core fundamentals like safety, life and death. Many kids carrying weapons thought they were safer when they’re carrying a weapon, because they believed no one would mess with them.

## Eliciting the Person’s Views on the Target Behavior

### ***Eliciting the person’s views on the target behavior***

- **How important is it (1-10) to you to change?**
- **Why didn’t you give it a lower number?**
- **What would it take to give it a higher number?**
  
- **Repeat same questions for confidence**

Then you find out their view. A quick and dirty way to do this that causes great conversations is to say on a scale of 1 to 10, we would ask them, *“How important is to you, the way you feel right this moment, to make a change in your seatbelt usage?”* And the kid might say, *“in the case of seatbelts, kid might say well, I could say about a 6.* So you say, *“Well, why didn’t you give it a lower number,”* and this elicits change talk. It elicits the argument, the pro change side of the change: *“Well, I don’t know, I’d be an idiot, I’m looking at all these injured people around me, I don’t want to come to the ER again.”* And you might say *“But you said that you almost never wear your seatbelt on our little questionnaire. What would it take to make it more important?”* And you find out what’s important to the kid that way.

And when you go here, and talk about importance of confidence, he might tell you, “Well, I think I could survive a crash as a 14-year-old, but if I knew my grandmother would be safer, I’d tell her to buckle up, and then I probably would, too.” There’s the value to the kid: The kid cares about other people. So we ask the same questions about confidence. Then the trick is to summarize his view so that your change intervention—your brief advice—is going to be received better.

## Summarizing the Person’s Views

So a therapist might say something like, *“So overall, you really feel two ways about it. On the one hand, you had this experience where you thought you were actually in retrospect safer by not wearing a seatbelt during that crash. On the other hand, you’ve told me that you know that for most people on the average, seatbelts work pretty well. You mentioned you’re kind of thinking about making a change there, but you’re not really sure. Now is that about right?”*

### ***Summarizing the person’s views***

- **Person feels understood**
- **Captures “change talk”**
- **Captures ambivalence**
- **Allows steering ahead to discuss change**

Again you're proving that you're not going to go and try to get them. This is what I hate about used car salesmen. You could have told them 40 times that you're ambivalent and all they need to say is, *"So you're not sure if you like that car because the roof's not high enough to sit upright in it."* Then I would think I like this guy, I want to buy a car from this guy because there's so many bad ones out there. I found a good one, if this guy has anything close to what I want.

**Discussing action options and giving advice using E-P-E style  
(no, this is the hardest part!)**

- **Elicit what person is planning to do**
- **Provide any concerns or advice you have**
- **Elicit their reaction**

Summaries are powerful and they allow you to forge ahead. So where does this leave you now? There's a style, a dancing style of giving information or advice that is the guts of most talking interventions when it boils right down to it. You've got to give an opinion and some information that will influence their attitudes or their perceived norms. So, if our interventionist wanted to impress on the kid the facts about bike helmets that the kid was mistaken about, she would ask, *"Well, can you tell me what you know already? What happens if you crash?"* (This is the kid that says, *"I'm a great rider, I'm not going to crash."*)

He'll talk about how he can ride all the way down the street on his back wheel. There's a lot of 12 year olds who can do that, you know? And it's hard for them to grasp how they're going to get smashed on Yesler Street. *"But can I give you some information?"* the interventionist asks. *"Some of our best riders, they're able to go fast, but the problem is, however quick they are, when you go faster, they fall prey to people's dumb errors out there. Maybe the kids are really good athletes and good riders, and can like fly over the hood instead of going through the windshield, because they're so quick and athletic like you. But when they hit the street, it's a different story."*

So, first you elicit what do they already know (or think they know) about crashes and bike helmets, then you say well, even good riders benefit a lot from helmets if they do crash, and then you elicit again their reaction. *"What do you think of that?"* And it gives them a chance to say, *"Well, I never knew that."*

## **Closing on Good Terms**

When it comes to discussing action, this is the hardest part of a brief intervention, because you're trying to cram all this into one session due to the realities of time. And so the least time is often devoted to this part of the session and sometimes that's okay because the kid's already told you, *"I'm being polite and talking about this I just don't think it's that important to change."*

But again: **elicit** (*"tell me what you're going to try here, tell me what you're thinking of doing"*) and then you **provide**: *"Well, I have to tell you, I have some concern about that, because we learned that if kids go out and hang out with the same people as you did, at the same time, and in the same context, it doesn't work very well. I have to tell you that the kids who make the*

*change from Budweiser to Pepsi, sometimes they seek out other kids, all right?” Then you elicit again: “But what do you make of that?” And he might say, “No, I’m not alcoholic I can be around my friends and not drink. I’m going to go tell them all to stop binge drinking after this trip to the emergency room.”,*

We often would try to recruit kids as helpers. If he says, *“I don’t think it’s necessary for me to stop binge drinking, but I have some friends who really have problems,”* you might ask what he tell those friends? *“I’d tell them it hurts you, it damages your brain, you lose your girlfriend.”*

That might be talking about someone else, but if that’s the best we can get, so be it. So then the idea is to leave the campsite cleaner than when you got there, that is, leave the kid less argumentative and defensive than when you first met him. Because in the public health system you’re not going to change their lives in one encounter. But you might plant seeds, and you might accelerate natural change, like stopping smoking or binge drinking in five years rather than ten.

The idea is to focus on what he did, say he has a great chance of accomplishing this change that he is considering: *“You told me you’ve already made other habit changes and you have a lot of discipline, and when you make your mind up to do something you really do well.”* Even hypothetically, with a pre-contemplator, you can say, *“You’re honest enough that if you decide this is important to you, then I think you can do it really well.”*

**Closing on good terms**

- **Summarize “change talk” again**
- **Point out person’s strengths**
- **Be optimistic**
- **Leave it so person won’t be open to exploring further the next time he/she discusses this with you or someone else**

I hope this has been helpful in painting a picture of some of our behavioral injury reduction interventions. Thanks very much for your time.

## **Books on patient-centered behavior change methods:**

Dunn CW, Rollnick S. (2003). *Lifestyle and Behaviour Change. A Rapid Reference guide.* London, Elsevier (*in press*).

Rollnick S, Mason P, Butler C (1999). *Health Behavior Change: A guide for practitioners.* Edinburgh, Livingstone.

Miller WR, Rollnick S. (2002). *Motivational Interviewing. Preparing People for Change.* Second Edition. New York, Guilford Press.

## **Internet resources:**

### **Training videotapes and workshops**

**Behavior change counseling training videotape** based on *Health Behavior Change* (book by Rollnick, Mason & Butler, 1999): [jeffallison.co.uk/index.htm](http://jeffallison.co.uk/index.htm)

**The Motivational interviewing page:** A repository of resources on motivational interviewing, including links, training resources, reprints and videotapes: [motivationalinterview.org](http://motivationalinterview.org)

**The Centre for Motivation & Change:** Training & consulting in the fields of chronic disease management, addictions, lifestyle change & health promotion, medication compliance: <http://www.tomaatnet.nl/%7Erikbes/cmc.htm>



## Techniques To Promote Behavior Change in Individuals: Tailored Health Communication

Matthew W. Kreuter, Ph.D., M.P.H.

Tailored health communication makes injury-prevention information relevant to its recipients by creating messages that are appropriate to one specific individual, rather than to a broadly defined population sub-group. In the general communication model of source, message, channel and receiver, tailoring is a kind of message strategy.



Message strategies exist along a continuum – from the totally generic to the perfectly tailored. Designing a communication strategy must include deciding on levels of assessment and feedback. Will the unit be the group or the individual? Will the message be simple or complex?

Customization at the level of the group is called targeting. Two covers for **Newsweek** magazine illustrate how a message can be targeted to specific population sub-groups, in this case men and women. This strategy is used to make the magazine more relevant to members of each group.



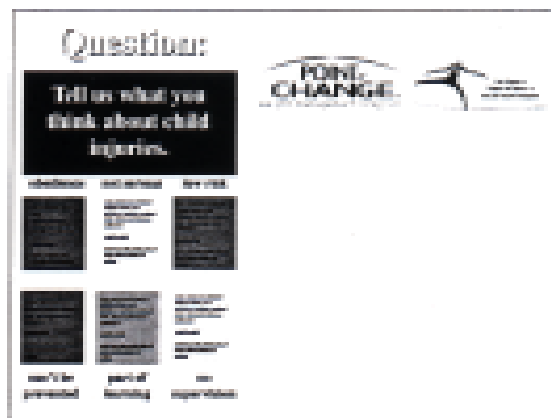
In contrast, tailored communication involves learning about specific individuals whose behavior we want to influence. Individuals can vary considerably on intention to change, barriers and benefits of change, self-efficacy, beliefs and expectations, perceptions of risk, and social support. Once we have such information about an individual, we can begin to customize our messages.

In studies comparing comparing tailored messages to non-tailored messages, the former are more likely to be:

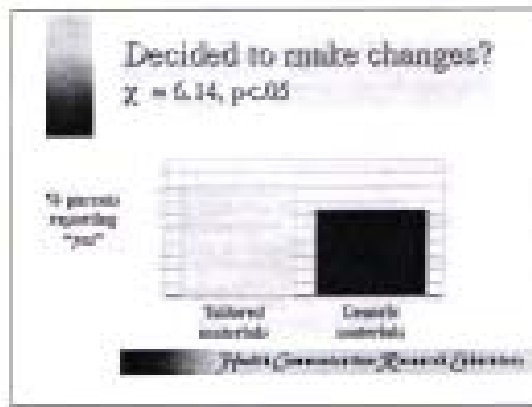
- read and remembered;
- rated as attention-getting;
- saved and discussed with others;
- perceived as personally relevant and interesting.

Does tailoring work? There is evidence that the approach has been successful in changing a number of health-related behaviors, including diet, smoking cessation, physical activity, mammography, child immunization, weight management, cholesterol screening, and participation in health-oriented programs.

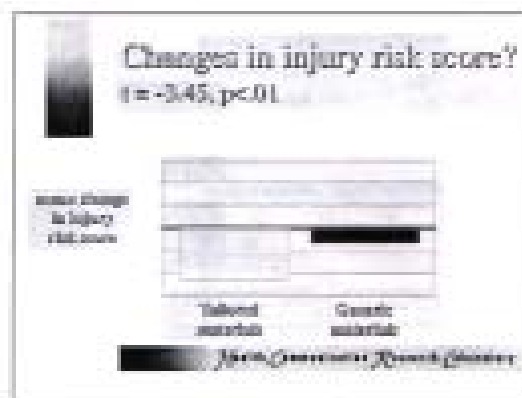
Does tailoring work for injury prevention? Let's look at some specific examples of how tailored communications were applied. One campaign concerned child injuries, and we began by asking parents about injury risks in and around their homes. Working at a pediatric clinic in Washington, D.C., we looked for changes in child injury-prevention activities in five areas: motor vehicle crashes, burns, falls, poison and drowning.



Working with 213 parents of 6-20 month old children, we divided the group into those receiving generic messages and those receiving tailored computerized messages. We followed up after three weeks to learn which parents had decided to make changes to help prevent injuries to their children. We found a higher percentage answering “yes” among the parents who had received tailored messages.



We also found that a higher percentage of the parents who had received tailored messages had tried one or more of the suggested changes, as well as positive changes in injury risk scores. A higher percentage also said they had talked to their doctors about injury prevention.



Safety Land is an example of our ongoing research on tailored health communication for child safety at the Saint Louis University Health Communication Research Laboratory. Andrea Gielen of Johns Hopkins University, who is also speaking here today, was principal investigator for this project. Safety Land was a computer tailored kiosk-based print intervention to encourage patients of the Harriet Lane Clinic at Johns Hopkins University to visit the Children’s Safety Center, a place to buy low-cost safety supplies and speak to a health educator about home and car safety.



We worked with families with kids aged 2-years-old and younger, and the study looked at parents who received tailored reports at well-child hospital-based clinic appointments compared with parents who received the usual care in the same setting. We did an initial assessment of

behaviors and another a month later. We assessed a number of injury-related behaviors:

- using stair gates (to prevent falls);
- storing poison safely;
- using syrup of ipecac in case of poisoning;
- having working smoke alarms;
- using car safety seats;
- using a safety resource center (Safety Land).

Reactions to the materials indicated that parents were receptive to the tailored messages:

- 89% read “all” of “some” of the report;
- 78% still had the report at follow-up;
- 72% identified “safety” as the main point of the communication;
- 71% reported they had made a safety change;
- 30% reported visiting Safety Land;
- 19% reported buying a safety product at Safety Land.

*Safety in Seconds*, a new injury-prevention research project at Johns Hopkins University and St. Louis University, looks at how effective tailored communication works in the promotion of smoke alarms, child-safety seats, and cabinet locks. The project works with families with children up to 5-years-old seen during visits to an emergency department. The intervention group will receive tailored safety messages, followed by a home visit two weeks later. We’ll then conduct telephone interviews six months after the initial contact.

How does tailoring work? The Elaboration Likelihood Model suggests that people are more likely to process information thoughtfully if they perceive it to be personally relevant. Messages that are elaborated on are more likely to be retained for a long period of time and lead to permanent attitudinal change.



## Behavior Change at the Community Level

Andrea Gielen, Sc.D, Sc.M.

An ecological model can help identify multi-level factors and intervention techniques. I'll provide some examples of successful multi-level interventions that have modified injury-related behaviors in populations and introduce community- and policy-level techniques and concepts.

### *Behavior Change at the Community Level*

*Andrea C. Gielen, Sc.D., Sc.M.  
Johns Hopkins Bloomberg School of Public Health  
Center for Injury Research and Policy*

*Behavioral Approaches to Injury Control Conference  
Harborview Injury Prevention and Research Center  
January 23, 2003*

#### *Aims*

- *Describe how an ecological model helps identify multi-level factors and intervention techniques*
- *Provide examples of successful multi-level interventions that have modified injury related behaviors in populations*
- *Introduce community and policy level techniques and concepts*

The Haddon Matrix provides a format for understanding these ideas. We can use safe driving as an example. The pre-event phase covers trying to get people to not drink and drive to prevent a crash. Using seatbelts works in the event phase to prevent injury in a crash. While we have had some notable successes in this regard, it is important to recognize that there are behavior change goals relevant in the vehicle and environmental cells as well.

	Haddon Matrix		
Pre-Event	Alcohol Use	Quality of	Road Conditions Brakes
Event	Seat Belt Use	Airbags	Break-away signposts
Post-Event	Other Health Conditions	Fuel System Integrity	Access to 911

In the following chart we see the host, vehicle, environment and a target audience for behavior change and some possible behavior change goals. In the host cell, our usual efforts are to reach high-risk people or at-risk people and get them to behave more safely. A second target

audience and goal, however, should be to reach the public at large and convince them to become advocates along with injury control professionals. By that I mean that perhaps we would do better if the public were more aware of and supportive of injury prevention strategies, such as product modification and environmental change, which are the two other columns in the Haddon Matrix.

## Roles for Behavioral Approaches

	Host	Vehicle	Environment
Target Audience	At-risk people Public at large	Manufacturers Engineers Business leaders	Policy Makers Law Enforcement Engineers Media Health Care Providers
Behavior Change Goals	Modify personal risk behaviors  Advocate for change in products, environment and laws	Make safer products  Make products easier to use safely  Make safety products more accessible	Make safer environments  Support & enforce safety legislation  Promote public awareness and safety-enhancing social norms

*Source: Gielen and Girasek, 2000*

In the case of the vehicles of injury, the behavior change goals could be for manufacturers, engineers and business leaders to make safer products, make products easier to use safely, and make safety products more accessible. In the environment we know that we need to change the behavior of policymakers, law enforcement, engineers, media and health care providers to make safer environments and help shape social norms that are more conducive to safety. There are many examples of successes in both of these areas. We have safer cars, child-resistant packaging, better toy labeling, safer roads, seatbelt and helmet use laws, just to name a few.

A better understanding of how these changes occur and how key decision makers are influenced would allow us to be even more effective in the future. The interaction of the host, vehicle, and environment suggest a multilevel or ecological model where the behavior of private citizens, manufacturers, decision makers, health care providers, and media influence our collective perceptions of injury risk.

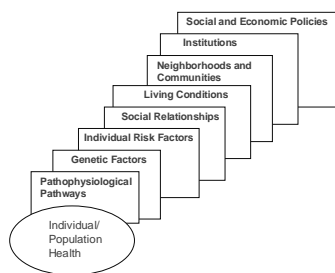
## Ecological Models



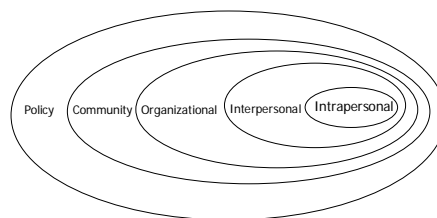
Ecological models theorize that health and well-being are affected by a dynamic interaction among biology, behavior and the environment. These interactions change over the life course of individuals, families, and communities. Ecological models are particularly relevant for injury prevention and control because they focus on the nature of people’s transactions with their physical and sociocultural surroundings with an emphasis on environmental determinants and interventions.

From an epidemiologist’s perspective, ecological approaches imply multiple levels of influence on individuals’ health and health behaviors. The individual’s and population’s health is a function of the genetic and individual risk factors and continues out to influence our behavior and health at the neighborhood, institutional, economic, and social policy level. The relationship and importance of these different levels of influence vary over our life course and in different sociocultural environments.

Multi-level approach to epidemiology  
(Kaplan, IOM, 2000)



Ecological Model for Health  
Promotion Interventions



(Emmons, IOM, 2000)

An ecological model from the perspective of health promotion intervention work is about the individual at the intrapersonal level with regard to an individual’s knowledge, attitudes and beliefs. At the interpersonal level, we think about the influence of significant others, their families, friends and coworkers on individuals. At the organizational level, we think about the influence of our workplaces, schools, and churches. At the community level, we think about the influences of the larger communities in which we live. Finally, at the policy level, we consider the influence of social policies on our communities, organizations, and lives.

**Theories at different levels**

- **Intrapersonal**  
Stages of Change Model, Health Belief Model, Theory of Reasoned Action, Theory of Planned Behavior
- **Interpersonal**  
Social Learning/Social Cognitive Theory
- **Organizational**  
Organizational Change Theory
- **Community/Policy**  
Diffusion of Innovation, Community Organization

There are many theories that help guide us at all levels. At the individual or intrapersonal level, the stages of change model, health belief model, theory of planned behavior or theory of reasoned action are all helpful. Selecting the most appropriate theory depends on your audience, your venue, and the characteristics of the behavior you’re seeking to change. The health belief model might be

particularly useful if you're developing messages about child passenger safety because it focuses on perceptions of risks and benefits of taking a protective action. A model like the stages of change might be more appropriate for an issue like domestic violence, where changing the behavior and circumstances to end violence are actions that often occur in smaller steps over time.

## Interventions at Different Levels

Just as there are different theories that are helpful at different levels, there are different interventions depending on the level. For example, at the individual level, typical interventions are a variety of education and training, like computer tailoring and motivational interviewing. When interventions focus on organizations, communities, and policies, the media, coalition building, and community organizing become more important.

Ecological Level	Targets of Change	Intervention Methods
Intrapersonal	Individual's knowledge, beliefs, skills, behavior	Counseling, education, training, Self-help, computer-tailored, media, pharmacological
Interpersonal	Social networks, social support	Education, training, role modeling, support groups, media
Organization	Organizational culture, structure, networks	School, worksite, church programs, media
Community	Economic opportunity, norms, resources, capacity	Coalition building, community development, media, advocacy
Policy	Public policies, laws, regulations, norms, resources, incentives	Community organizing, media, advocacy

Glanz and Rimer, 1993; IOM, 200

## From Theory to Practice...

From theory to practice....

**Community and policy level techniques**

- ☞ Community organizing
- ☞ Advocacy



*Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.*

Margaret Mead

Let's move from theory to practice and focus on community organization and advocacy. A famous quote from Margaret Mead says, "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has." I will now focus on community organizing and advocacy. As we move into this realm of community organizing and

advocacy, we may find that we are out of our typical comfort zone and a different skill set is needed.

The Harlem Hospital Injury Prevention Program is an example of a community-based intervention that has demonstrated success. It was developed in 1988 by Dr. Barbara Barlow who created the Northern Manhattan Injury Surveillance System, a population-based tracking system. The system was used, not only to identify important injury problems, but also served as a baseline for evaluation of future interventions.

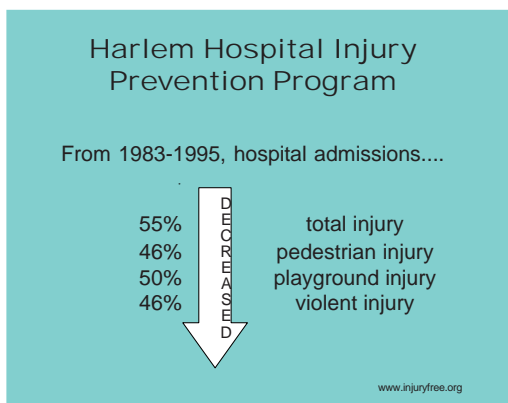
Dr. Barlow invited input from the community and a coalition of more than 26 organizations was formed. Both surveillance data and community members' interests shaped the interventions that were developed. Interventions that were developed included window guard legislation because emergency departments were seeing many children who had fallen out of high-rise apartments in the neighborhood. They worked to pass legislation to require window guards in high-rise buildings. This is a perfect example of a neighborhood impacting a health problem.



### Harlem Hospital Injury Prevention Program

- 1984 surveillance system established and demonstrated child and adolescent injury problems
- 1988 coalition formed to develop education programs, safe play areas, and supervised activities
- Window guards legislation; playground improvements; Safety City; bicycle safety and free helmets; art, dance, gardening programs; conflict training

They also focused on playground improvements. Children were playing in the streets and getting hit by cars because the playgrounds had been taken over by trash, and often times, by drug dealers. They developed a “safety city,” an educational program for children on bicycle safety and gave away free helmets. They also did interventions that we don't think of when we think about injury prevention - art, dance, gardening programs. These are things that give people a sense of worth. Not only does it make people feel better, learn skills, and have fun, but it keeps them from being exposed to hazardous environments that cause injury.



Data show that from 1983 to 1995 their hospital admissions decreased 55 percent for total injuries, 46 percent for pedestrian injuries, 50 percent for playground injuries and 46 percent for violent injuries. Another indicator of success is the fact that this initiative is now a national model, the Injury Free Coalition for Kids (IFCK). An IFCK now exists here in Seattle. It's a \$15 million national program of the Robert Wood Johnson Foundation that works to reduce and prevent injuries to children through approaches driven by hospital-based research and always implemented in partnership with coalitions and community stakeholders.

The most important principles that come from this approach are empowerment, relevance and participation (Green and Kreuter, 1999). These principles are defined:

- **Empowerment:** Programs need to foster community ownership and focus on participatory problem-solving processes.
- **Relevance:** Behavior change will be greatest when community organizers start where the people are and engage community members as equals.
- **Participation:** Behavior change will be greatest when those whose behavior or circumstances are to be changed are directly involved in intervention planning and decision making.

***Community organization theory and advocacy approaches emphasize....***

- ***Active participation and development of communities that can better evaluate and solve health and social problems***
- ***Increasing the power of people and groups to make institutions more responsive to needs***
- ***Increasing capacity of communities to participate more fully in determining issues and developing and implementing strategies that best address them***

Minkler and Wallerstein, 1997

## **Community-Based, Not Community-Placed**

Meredith Minkler and Nina Wallerstein have just published a new book on community-based work. The idea is that we have messages to convey, but our audiences have real lives. If we create messages in the absence of understanding those real lives, that real context, the messages will not be as effective. We need to engage our audience in defining the problem and solution so that our messages will match their realities. Programs need to be community-based, not community-placed.

Where do we go from here with regard to behavioral approaches to injury prevention at the community level? I think there are at least two urgent issues. We need to embrace the notion of

community-based participatory research (CBPR). This would seem ideally suited to our situation, in which we have many effective interventions and we need to devise effective dissemination strategies. Second, we need to develop a better understanding of the processes by which change can be facilitated across the multiple levels of influence. Again, this is particularly important for injury control because so many of our interventions require change at levels external to the individuals, such as modifying products and laws.

### ***Community-based participatory research***

***\* Collaborative approach to research***

***\* Equitably involves all partners in the research process and recognizes the unique strengths that each brings***

***\* Begins with a research topic of importance to the community***

***\* Aims to combine knowledge and action for social change to improve community health and eliminate health disparities***

Minkler and Wallerstein

CBPR is defined by the Kellogg Foundation Community Health Scholars, and written about in the book I mentioned to you by Meredith Minkler, as a collaborative approach to research that equitably involves all partners in the research process and recognizes the unique strengths that each brings. CBPR begins with a research topic of importance to the community with the aim of combining knowledge and action for social change to improve community health and eliminate health disparities. This is particularly relevant for injury prevention where we know of many effective interventions, but they're not being widely adopted. Partnerships with the community can help in dissemination.

Another reason why CBPR may be particularly appropriate to injury prevention is because the degree to which products and environments can be modified to reduce injury risk depends on not just technology, but equally on the will of the public. Professionals should consider the public the center of gravity for injury prevention programs, to borrow a phrase from Larry Green, because they provide the balance in government intervention and individual freedom that is required in this situation. For the public to make informed decisions they must be enlisted as full partners in finding and implementing solutions.

Finally, the need for a better understanding of the multiple levels of influence was echoed by a recent Institute of Medicine reports that for many health problems and health behaviors, we need to identify the pathways through which social contexts affect outcomes and we need to link multiple levels of influence to interventions.

## IOM Report, Promoting Health, Selected Recommendations

- ✦ **Identify pathways through which social contexts affect outcomes**
- ✦ **Link multiple levels of influence in interventions**
  - ☐ Not upstream vs. downstream, need both
- ✦ **Integrate qualitative and quantitative methods to better understand multi-level factors and interventions**

We need to integrate qualitative and quantitative methods to better understand the multiple levels of factors and the interventions. This is particularly relevant for injury prevention because so many of our interventions require action not just by individuals, but also by organizations external to the individual. There are at least two issues here: first, how does change happen from the time a law is passed or a product is redesigned to the time when the public has widely accepted the new behavior or the new safer product? And how do product modifications affect their safe or unsafe use?

Secondly, how can we most effectively and efficiently influence the behavior of decision makers who pass legislation and design our physical environments, and those manufacturers who sell products? This last question brings me to my conclusion. In our efforts to answer this question, and in fact, to undertake the necessary advocacy work, we must acknowledge that working at the community level is not easy, as it often puts us in controversial situations and up against major political and industry forces. Nevertheless, there are examples of successes in other fields such as tobacco control, as well as in our own injury field such as motor vehicle safety. Learning from these successes will help advance our progress in the future.

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David Sleet, Ph.D.

A significant behavioral science knowledge base about how to promote individual and community health has developed over the past half century that is relevant to injury prevention. Since arriving at the CDC in 1993, it's been my vision to build the field of behavioral and social science for injury control by both adapting what we've learned in other areas, like HIV prevention, and through the discovery of new knowledge specific to injury prevention. Our Center Director at the time, Dr. Mark Rosenberg, recruited behavioral scientists and saw a need to begin breaking down the barriers that prevented behavioral approaches from flourishing in our field.

We started by inaugurating an International Working Group on Unintentional Injuries and Behavioral Sciences in 1998. We invited prominent researchers in the field to spend 2 days at CDC to work with us to identify the relevant issues, approaches and opportunities. Two of those behavioral scientists, Matt Kreuter and Andrea Gielen who are on the program today, and others in the audience, like John Lowe, were part of that original group.

Our goal was to document the contributions of behavioral science to injury prevention, identify helpful methodologies, share approaches, and to encourage high quality research. One tangible result of that initial meeting is a Bibliography of Behavioral Science Research in Injury Prevention, which we compiled with the assistance of the Group, and my co-author, Krista Hopkins. It contains over 750 citations of published studies in injury that use or are relevant to behavioral and social science in injury prevention. You can search by topic area (like drowning prevention) or by author. The document will be a useful resource both for those in behavioral science and for those in injury prevention. CDC will produce this on a CD-ROM, put it up on our website ([cdc.gov/injury](http://cdc.gov/injury)) and provide a limited number of printed copies for those who request it, in November, 2003.

### **Opportunities for Behavioral Research**

In other developments, we have been working with the Society for Public Health Education (SOPHE) for many years to include injury prevention in their work. SOPHE members are traditionally researchers in health education, patient education, and behavioral and social sciences. We'll have the Bibliography available on the SOPHE website ([SOPHE.org](http://SOPHE.org)) along with some annotated studies demonstrating the use of behavioral science in injury prevention.

We also support SOPHE in a SOPHE/CDC Injury Prevention Fellows program, which provides talented masters and doctoral level students in the social and behavioral sciences an opportunity to do targeted research with some financial support. CDC also supports a "New Investigators" research program, open to behavioral scientists as well as others, to encourage scholars who have just completed their degree (or those changing fields into injury prevention) to propose seminal research studies that don't compete with the more seasoned research proposals we get in our R49 program. In the past, we have attracted psychologists who would not have

otherwise sought our funding.

New this year also is a Dissertation Grant program. This program will support students completing a dissertation on an injury-related topic. As in the New Investigators research program, they need to identify an active faculty sponsor and mentor, and propose work that can survive the scrutiny of an objective peer review process. This has been an excellent mechanism to support dissertation research and bring new people into our field.

There is also the Small Business Innovative Research Grant Program (SBIR). Behavioral researchers qualify for this program as well, and many of these proposals relate to human factors research that would result in an innovative product or service that has injury prevention potential (<http://grants1.nih.gov/grants/funding/sbir.htm>)

Other opportunities for funding behavioral science research at CDC include our R49 grants program, which is managed in an NIH-like process with objective peer review. During the past four years, our RFPs have had sufficient latitude to accommodate behavioral studies in areas such as motor vehicle injury prevention, fire and burn prevention, falls, and violence prevention. Our recent interest in supervision research, sports and recreation injury prevention, and child and older adult safety have widened the opportunity for behavioral scientists to become more active in fulfilling our research agenda. Of course, theory-based approaches are always encouraged, and something our field needs more of.

## **Opportunities with Partners**

During the past several years, CDC has co-sponsored a symposium, session or roundtable on violence prevention or unintentional injury prevention at the annual American Psychological Association (APA) meeting. The Division of Violence Prevention at CDC (and its Division Director, Dr. Rodney Hammond) have forged strong partnerships with APA and consequently CDC and APA have many joint ventures ongoing. This relationship between CDC and APA has resulted in an important publication INTEGRATING BEHAVIORAL SCIENCE AND SOCIAL SCIENCES WITH PUBLIC HEALTH (Schneiderman, Speers, Silva, Tomes, Gentry, (Eds), APA, 2001) which CDC helped develop. This year APA developed a conference strand on “Psychology Builds a Healthy World,” and they plan a book from this effort in 2003, with CDC scientists serving as co-editors.

Our partnerships also extend to the Consumer Product Safety Commission, and the US Fire Administration who are helping us look at improving smoke alarm technology and investigate the human response to fire in ways that should help improve egress from house fires. We have several projects looking at ways to increase adoption and diffusion of effective injury prevention interventions like booster seats and .08 BAC legislation, and dissemination research that will help us understand channels and processes to improve behavioral compliance. We also have some contract research ongoing related to behavioral risk factors for injury.

We also work with a number of consultant behavioral scientists, mostly clinical

psychologists, and some anthropologists and sociologists on intramural research at CDC. Dr. Fishbein is an example of that. When Marty Fishbein joined CDC as a Visiting Fellow, he effectively helped modify the way we thought about using the behavioral science knowledge base for HIV and STD prevention. Although he spent about 4 years at CDC in various capacities, it has taken us this long to invite him help to help us think about injury and behavior. We are grateful for his help.

At the present, there are many behavioral scientists in the Division of Violence Prevention at CDC, and some of the work we do together has involved studies on evacuation in mass casualties, and a study on the psychological aftermath of 9/11. Our work with the Division of Behavioral Science and Health Education at Emory University has led to published studies on behavioral factors in child safety seat use, escaping fire, and bicycle helmet use.

## **A Growing Field**

The intersection between health promotion and injury prevention has been another focus of ours, as we try to build a framework for delivering interventions that include education/behavior change, legislation/enforcement, and technology/engineering. With our help, the journal Health Promotion Practice, an official journal of SOPHE, published a theme issue on injury prevention (Vol 4, No. 2, April, 2003) highlighting many of these issues. In addition, the journal Patient Education and Counseling (Vol 46, 2002) devoted an entire special issue (edited by Dr. Andrea Gielen) to injury prevention. Epidemiologic Reviews will have a special issue on injury prevention, with a leading paper on the application of behavior change theories and methods to injury prevention, authored by Dr. Gielen and myself (Vol 25, 2003), and the American Journal of Health Education will publish a special issue on child and adolescent injury prevention in September/October, 2003. The American Journal of Health Behavior has also planned to publish a special issue on Injury in 2004. These are examples of the growing interest in (and demand for) relevant health behavior research in injury prevention.

## **Behavioral Science at the CDC Injury Control Research Centers**

CDC funds 11 “Centers of Excellence” or Injury Control Research Centers (ICRC) throughout the United States. Each center proposes a series of large research studies they will pursue in their core, as well as and smaller projects they want to conduct as pilot work. In 2000, we supplemented each ICRC with “seed money” in behavioral science to begin exploring ways to incorporate behavioral and social science studies and training into their work. This has been very successful and some of the projects, like this conference, were directly linked to that funding incentive

For example, at the University of Alabama they issued an RFP and solicited proposals from other disciplines within the university to do research on injuries and behavior. In San Francisco they are conducting interventions on post-traumatic stress disorder using art therapy with pediatric patients. In Pittsburgh, they are interested in exploring the influence of social ecology and social context on injury outcomes. In North Carolina, they’re hiring three visiting scholars

in behavioral science to work with graduate students. At UCLA, they're supporting interns in the departments of psychology and sociology to work with their injury center research staff. At Harvard they're studying behavioral factors for unintended firearm discharge. In Iowa, they've done a project (and published the results) on influencing journalists to report on the preventability of injuries in their news stories. At Colorado State they're implementing a community readiness model for injury prevention. At Johns Hopkins University they are looking at literature in injury to see how often behavioral theory has been used. At Harborview (here) you have decided to sponsor this one-day symposium on behavioral science and injury, and I congratulate you on that. This has been a very important meeting.

You can see from this range of activities that a little directed support to behavioral science can often produce impressive outcomes. My hope is it will also stimulate further activities and collaborations in the future. I've already seen this happening in your own case here at Harborview, with researchers, staff, and students making connections that weren't there a year ago.

### **The CDC Injury Research Agenda**

([www.cdc.gov/ncipc/pub-res/research\\_agenda/agenda.htm](http://www.cdc.gov/ncipc/pub-res/research_agenda/agenda.htm))

In December, 2000, the CDC Injury Center embarked on an 18-month process to develop an agenda to guide our research. The agenda articulates our highest priorities –those research questions that we must answer to fulfill our public health responsibilities. The research agenda focuses on answering questions that will have a relatively rapid impact on how we prevent injuries and reduce their consequences. Thus, many of the research issues, methodologies, and tools require behavioral approaches.

The agenda follows a framework that includes phases of research, ranging from Foundational, Developmental, Efficacy and Effectiveness research to Dissemination research. The potential for behavioral and social science contributions can be found in each. Key areas that would benefit from behavioral science investigation include: foundational research on psychological and behavioral aspects of child supervision; the psychology of evacuation from mass trauma; motivating people to engage in personal protective behaviors; applying behavior-change theory to injury prevention interventions; communications and diffusion research to increase the acceptance of effective interventions; theoretical research to clarify the mechanisms by which behavioral change occurs; research on modifying risk perception, social norms and other factors related to behavior change.

The agenda will guide our intramural and extramural funding for the next 5-10 years. Because it has involved the input hundreds of people and many months of group meetings, web-posting and synthesis, we have already found it has fostered new partnerships across disciplines.

What follows are research areas in the agenda, and the expenditure from last year totaling around \$48 million for extramural research:

- \$2 million for suicide;
- \$17 million for domestic violence;
- \$4.5 million for residential and community safety;
- \$0.9 million for sports;
- \$3 million for transportation;
- \$8.3 million for acute care; and
- \$12 million for youth violence.

Over half of the extramural funds were distributed as grants, about a third went out as cooperative agreements, (mostly to states or state health departments), with the rest spent in contract research. We will need research across the range from discovery of new knowledge all the way through the delivery of effective programs.

As we move more toward the delivery side of research, there is much to be learned about effective delivery systems, processes to speed diffusion, and methods to increase adoption and compliance. We are looking to behavioral and social sciences (together with communications sciences) to help us answer many of these questions.

## **Behavioral Science and the Research Agenda**

Many opportunities exist throughout the agenda for research in behavioral and social science. In fire and burn prevention, for example, we need behavioral interventions to prevent fire injuries and to improve evacuation in a fire. For children and older adults, supervision is often touted as an effective solution to prevent injuries from falls or drowning, yet we know very little about the meaning, interpretation and practice of parental supervision. We don't even have a taxonomy of supervision in order speak about it in a common language.

For community-based fall prevention, we need to know the behaviors that are causally related to falls, the components of effective fall-prevention programs, and how best to disseminate those to others.

In transportation, we need to know more about promoting the behaviors related to safe mobility of older drivers. There are many questions to promoting safe pedestrian behaviors in both children and adults. Measuring the impact of vehicle technologies, information display systems and thresholds for driver distraction will require human factors research. Driver risk taking and the role of parents and peers are important research areas to help us understand how to

improve the survival of young, inexperienced drivers (some work we are supporting with NIH).

In suicide research, we need more knowledge about what works to prevent suicide, and modifying interventions for culturally diverse groups.

In youth violence we need more research on parenting programs, the risks of victimization in relation to social learning (especially among women), media effects on youth violence, and the psychological effects of witnessing violence for both children and youth.

In partner violence and sexual abuse, we need research to identify behavioral risk and protective factors, implementing effective training programs for health workers, and measuring the effects of social norms on behavior.

In the clinical care arena, we need better protocols for screening and counseling for injury prevention, and we need to test different motivational interviewing techniques for behavior change. We know little about the psychological impact of TBI, and how to improve patient safety, or the benefits of referral systems on injury recidivism.

In sports, recreation and exercise, how do you tailor fitness training to individual differences while protecting against injury? For research in boating and outdoor recreation, we lack tools for measuring exposure.

There are also a number of cross-cutting research priorities, in our agenda, like alcohol, parental supervision, and child abuse that cut across and affect many injuries simultaneously. It's hard to imagine any one of these injury research areas that don't involve a behavioral component.

## **Remaining Challenges**

As much as we would like to hope otherwise, most injuries cannot be resolved by introducing a vaccine-like technology, as the technology must be proven safe, adopted by people and used properly in order to be effective. This challenge requires the expertise of behavioral scientists. The CDC Injury Research Agenda should give you a wide breadth of research topics and many new research questions to answer using expertise in your field. I am hoping it will also engage other behavioral scientists in our work, and it will help you align your professional goals with our research needs.

In the practice arena, we need stronger partnerships with academic researchers to enhance the applicability of research to practice and vice versa, as well as to increase the use of community-based participatory research methods and behavioral epidemiology. We believe these are important steps for strengthening the application of behavioral science to injury control, which in turn can contribute to changing individual behaviors, environmental conditions, and social structures to prevent injuries to us all.

To further advance the contributions of the behavioral sciences to injury prevention, more attention should be paid to issues of training, research and practice. Training more behavioral scientists in the epidemiology of injury and the science of injury control is an urgent first step. Likewise, behavioral science training of injury professionals is essential. Your conference today accomplishes both.

Finally the challenges for behavioral science include the need to understand more about behavioral antecedents and correlates to adoption, compliance and maintenance behaviors, to broaden our application of theories, to improve outcome measurements and measurement tools, to integrate across our disciplines of interest, and to do a better job communicating these findings within behavioral science but also in the field and literature of injury prevention. The CDC Injury Center hopes you and other behavioral scientists can find a way to contribute to our work.

## **Selected References**

**Available February 1, 2004:**

### **Bibliography of Behavioral Science Research in Unintentional Injury Prevention**

**Compiled and Edited by David A. Sleet, PhD, Krista Hopkins, MPH**

Centers for Disease Control and Prevention

Division of Unintentional Injury Prevention

**The Bibliography of Behavioral Science Research in Unintentional Injury Prevention includes more than 900 citations of journal articles, book chapters, government reports, and other publications. Designed as a tool for researchers, practitioners and students, this bibliography documents the contributions of behavioral and social sciences to unintentional injury prevention and control from 1980–2003. The CD-Rom includes the complete bibliography in two formats: (1) alphabetical by author; and (2) by injury topic. Citations are also indexed by keyword. A limited number of bound copies are also available.**

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