Origin of the Theory of Triadic Influence (TTI)

Before describing the TTI, it is useful to put it into context by covering a brief history of health-behavior theory. Health-behavior theory has developed from research conducted by social psychologists (Noar, 2005). In the 1950s, social psychologists sought to understand behavior through the lens of theories such as Stimulus Response Theory and Cognitive Theory (Janz, Champion, & Strecher, 2002). The main claim of Stimulus Response Theory is that individuals learn from events and change their behavior accordingly. The assertion of Cognitive Theory is that behavior stems from the subjective value placed on an outcome and the expectation that an action will result in a particular outcome. Several prominent scientists conducted the research that led to the emergence of these and other related theories.

Godfrey Hochbaum and Irwin Rosenstock were social psychologists who worked for the U.S. Public Health Service during the 1950s and 60s and later pursued academic careers in the behavioral sciences. During their employment at the U.S. Public Health Service, these two researchers sought to explain the failure of individuals to participate in disease prevention programs, such as Mycobacterium tuberculosis screening programs. This work led to the development of the Health Belief Model, which includes the constructs of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. Albert Bandura subsequently added self-efficacy (Bandura, 1977) to the Health Belief Model, effectively demonstrating how theories can change as they become subject to additional scrutiny and empirical testing. This progression has also occurred during the development of intrapersonal theories that have been applied to health behaviors, for example, the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and its corollary, the Theory of Planned Behavior (Ajzen, 1985).

Frequently, these theories, along with interpersonal theories such as social learning theory (Bandura, 1977) and the social development model (Catalano & Hawkins, 1996; Hawkins & Weis, 1985), share theoretical constructs and concepts. They largely focused on proximal influences (described in detail below) of health-related behavior, such as intention to perform a behavior, and few distal factors such as interpersonal bonding. Health-behavior theories have incorporated, for example, subjective normative beliefs, values and evaluations, knowledge and expectations, and interpersonal processes such as those included in social learning theory (Bandura, 1977). Beyond the intrapersonal and interpersonal theories, ecological models (e.g., Bronfenbrenner, 1979) acknowledge that more distal, cultural-environmental factors influence health-related behavior. Taken together, all of these theories leave researchers and practitioners with a range of information that may be difficult to navigate.
Nearly two decades ago, given the complex mass of theories and variables, particularly in the substance use dossier, Petraitis, Flay, and Miller (1995) meticulously examined the literature to conclude that variables can be organized along two dimensions: levels of causation and streams of influence. From these findings the TTI (Flay & Petraitis, 1994; Flay, Snyder, & Petraitis, 2009) was proposed to acknowledge numerous behavioral influences and to provide a structured and testable integrated theory. Although at first glance the TTI appears complicated (like behavior), it is organized in a cogent $3 \times 3$ framework—3 levels of causation and 3 streams of influence. Next, the levels of causation and streams of influence are described, followed by a discussion on how the TTI extends prior ecological theories. For a more expansive and in-depth description see Flay, Snyder, and Petraitis (2009).

**Description of the Theory of Triadic Influence**

**Levels of causation.**

The TTI categorizes independent variables that predict behavior into three levels of influence: ultimate, distal, and proximal. **Ultimate-level causes** are broad and relatively stable, and they are causes that individuals have little control over such as their cultural environment. Their effects, however, are the most pervasive (influencing multiple behaviors), the most mediated, and often the most difficult for any one person or program to change, but, if changed, they are likely to have the greatest and longest-lasting influence on a broad array of behaviors. These causes include politics, food policy, religions, mass media, socioeconomic status, modern society’s fixation on the pursuit of economic growth (as opposed to steady-state economics; cf. Daly & Farley, 2004; Egger, 2009; O'Neill, Dietz, & Jones, 2010), availability of recreational parks, age, ethnicity, and personality. These ultimate-level causes also include the availability of good schools and after-school programs, parental values, and cultural practices. Ultimate-level causes can vary widely from place to place. For example, urban dwellers may have different ultimate levels of influence than people in rural areas.

**Distal-level influences** are variables affecting behavior that individuals are likely to wield some control over. The first level of distal causes is at the social-personal nexus that includes, for example, general self-control, bonding to parents or deviant role models, and religious participation. These are variables that reflect the quality and quantity of contact between individuals and their cultural environments and social situations. A subcategory of distal-level influences called second-order distal influences are another step closer to behavior and are a set of affective/cognitive influences termed evaluations and expectancies. They are general values and behavior-specific evaluations as well as general knowledge and specific expectations/beliefs that arise out of the contact between individuals and their surroundings. For example, the expectations of working hard at school, combined with associating with peers who make academic success a priority, can influence attitudes and normative beliefs.

**Proximal-level** predictors are more immediate precursors to a specific behavior and are
under the control of an individual, although still influenced by the distal and ultimate factors described above. The theory contends that decisions, intentions, and experiences have a direct effect on a particular behavior. Research has consistently shown that proximal variables included in the TTI are robust predictors of behavior (Fishbein & Ajzen, 1975; Flay et al., 2009).

All three levels influence behavior, although the proximal level is usually more directly predictive of specific behaviors. For example, a decision or intention to perform a behavior such as studying is highly predictive of the actual performance of behavior. If an adolescent intends to assist a younger sibling in learning a new skill, the adolescent may predictably perform that behavior. As a more detailed example, if an adolescent purchases a bicycle and helmet because she intends to bike to school as a way to be environmentally responsible, she is more likely to ride a bike to school. Many factors may play a role in influencing the decision to ride her bike. An example of a proximal one is that if she has the will and the skill (i.e., self-efficacy) to ride her bike, she would be more likely to perform this behavior. Other factors may be more distal, such as perceived norms about bicycling. If her peers believe cycling is only for those people who cannot afford a car or who have been legally blocked from driving one, she may be less likely to ride her bike. An example of an ultimate-level cause is the approach to cycling in the community where she resides—whether the area values more sustainable transportation and accommodates bicyclists with safe bike lanes and established recreational bike paths.

Streams of influence.

Intrapersonal influences. Figure 1 shows that causes of behavior can be categorized into three streams of influence—intrapersonal, social, and cultural-environmental—that converge on intentions and behaviors. The intrapersonal stream of the TTI (towards the left on Figure 1) begins at the ultimate level with relatively stable biological predispositions, such as testosterone levels, and personality characteristics including openness to experience, consciousness, extraversion, agreeableness, and neuroticism. The TTI predicts that these ultimate-level intrapersonal causes have direct effects on social/personal nexus variables in the intrapersonal stream, including self-esteem and general competencies (e.g., locus of control). These intrapersonal variables then have, according to the TTI, direct effects on variables such as self-determination and general skills. These distal influences in the intrapersonal stream are more targeted to a specific behavior, such as academic behavior in students, and include the will or determination to engage in the behavior and the perceived skills to succeed in the behavior. Finally, consistent with Self-Efficacy Theory, these variables form one’s sense of self-efficacy about a particular behavior, such as completing homework after school.

Social influences. A similar flow exists within the interpersonal stream of the TTI. The interpersonal stream begins with ultimate-level characteristics of one’s immediate social surroundings that are largely outside the control of individuals (e.g., school and teacher quality, parenting practices during one’s childhood). It continues through social/personal nexus variables
in one’s immediate social surroundings, including the strength of the interpersonal bonds with immediate role models, such as teachers and parents, and the relevant behaviors of those role models (e.g., whether family members are life-long learners). The flow then continues through variables that include motivation to comply with various role models (e.g., whether to comply more with family members or teachers or peers), and perceptions of what behaviors those role models are encouraging. Finally, consistent with the Theory of Reasoned Action, social influences form social normative beliefs regarding the specific behavior; that is, perceptions of social pressures to engage in a particular behavior.

Figure 1. The Theory of Triadic Influence

Adapted from Flay, Snyder, and Petraitis (2009).

_Cultural-environmental influences._ The third stream of the TTI, the cultural-environmental stream, follows the same pattern as the previous two streams. It begins with broad cultural characteristics that are largely beyond an individual's control, such as political, economic, religious, legal, mass media, and policy environments (Minkler, Wallace, & McDonald, 1995). The third stream flows into variables including the nature of the interactions people have with social institutions, such as political, legal, religious, and governing systems, and the information and values they glean from their culture (e.g., what they learn from exposure to mass media).
The cultural-environmental stream then flows through variables related to the consequences one expects from a behavior, such as whether going to college is useful and how much it will cost, and how one evaluates, favorably or unfavorably, the various consequences of a behavior. Finally, consistent with the Theory of Reasoned Action, these influences form one’s attitudes toward a specific behavior, such as civic engagement.

**Cognitive and affective sub-streams and their interactions**

In addition to the three major streams, each stream contains two sub-streams. One sub-stream is more *cognitive and rational* in nature, based on an objective weighing of the perceived pros and cons concerning a given behavior. The other sub-stream that influences behavior is more *affective* or emotional and less rational. Thus, decisions are not always rational; they may include an affective or emotional component (i.e., hot cognition; Dahl, 2001, 2004) and be completely irrational (Ariely, 2009).

For some readers, the proximal levels of all streams (self-efficacy, social normative beliefs and attitudes) may seem like intrapersonal factors. However, these affective/cognitive factors that originate from interpersonal (social situation $\rightarrow$ social normative beliefs) or cultural-environmental (cultural environment $\rightarrow$ attitudes) factors are distinguished from those that originate within the person (biology/personality $\rightarrow$ self-efficacy). Within the TTI, each and every stream ends in affective/cognitive factors (i.e., self-efficacy, social normative beliefs, and attitudes) that influence the most proximal affective/cognitive predictor of behavior, intentions.

The theory also recognizes that influences in one path are often mediated by or moderate influences in another path. Further, the TTI recognizes that engaging in a behavior may have influences that feed back and alter the original causes of the behavior.

**An ecological view of the TTI**

Figure 2 illustrates that the TTI emphasizes both ecological rings and levels of causation. The three streams of influence in the TTI and the notion of inter-related influences are similar to the rings of influence in Bronfenbrenner’s (1979) ecological systems theory. However, most conceptions of ecological systems do not consider the levels of influence within the rings. In the TTI, intrapersonal factors are seen as nested within social factors that, in turn, are nested within broader socio-cultural environmental factors, just as in the basic ecological models. Within the TTI, all three rings/streams also have causal influences at multiple levels, including ultimate/underlying, distal/predisposing, and proximal/immediate. Further, as Figure 2 shows, time and development influence levels of causation, whereby lower levels often incorporate faster processes.

Time also influences program effects; for example, effective SECD-related programs that are not sustained or followed-up by continuous supports will likely have less impact over time (Denham & Weissberg, 2004). In sum, the TTI consists of three levels of influence, three major streams each with two sub-streams of influence, dozens of predictions about mediation and moderation among variables, and feedback loops.
Figure 2. The Theory of Triadic Influence Ecological System

Adapted from Flay, Snyder, and Petraitis (2009). Note: Eval = Evaluation, Att = Attitude towards the behavior, MC = Motivation to comply, SNB = Social Normative Beliefs, Know = Knowledge, Exp = Expectancies.

Extant Application of the Theory of Triadic Influence

Researchers frequently acknowledge the TTI as a way to address the proximal predictors, distal influences, and ultimate causes that influence behavior. Additionally, researchers from a growing number of disciplines recognize the importance of the intrapersonal, interpersonal, and cultural-environmental streams of influence. The majority of articles that reference the TTI have focused on the etiology of several behavioral domains and, most frequently, studies come from the substance use domain (see Table 1). This is not a surprise as the genesis of the TTI occurred after a careful review of the substance use literature. Many recent studies recognize the importance of the TTI in integrating the variety of variables influencing health-related behavior. Nevertheless, here is much room for expansion of using the TTI among Health Promotion researchers and practitioners.
Table 1. Literature referring to the TTI by behavioral domain and type of study.

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<tr>
<th>Behavioral Domain</th>
<th>Etiology</th>
<th>Intervention</th>
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<tr>
<td><strong>Dietary Behaviors</strong></td>
<td>Brug, de Vet et al., 2006; Kamphuis et al., 2006; Rodenburg et al., 2011</td>
<td>Brug et al., 2003; Klepp et al., 2005; McCall et al., 2005; Sandvik et al., 2005; Schols &amp; Brug, 2003; te Velde et al., 2006; Wind, 2006; Wind et al., 2006</td>
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<td><strong>Dietary Behaviors and Physical Activity</strong></td>
<td>Brug, van Lenthe et al., 2006; de Bruijn et al., 2005; de Bruijn et al., 2005; Kremers et al., 2005</td>
<td>Wang et al., 2006</td>
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<td><strong>Health-Related Behaviors</strong></td>
<td>Flay &amp; Petraitis, 1994; Freudenberg et al., 1995; Lippke et al., 2012; Perry, 2004; Tobler et al., 2011; Valazquez et al., 2011</td>
<td>Brug et al., 2005</td>
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<td><strong>Mental Health</strong></td>
<td>Bell et al., 2009; Fuemmeler, 2004; Mann et al., 2004</td>
<td>Bell &amp; McKay, 2004; Bell &amp; Pequegnat, 2012; Breland-Noble et al., 2006; Breland-Noble et al., 2011; Breland-Noble et al., 2011</td>
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<td><strong>Multiple Risk Behaviors</strong></td>
<td>Busseri et al., 2007; Hirschberger et al., 2002; Willoughby et al., 2011</td>
<td>Browne et al., 2001; Flay &amp; Collins, 2005; Flay et al., 2004; Fagen &amp; Flay, 2009; Li et al., 2011</td>
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<td><strong>Physical Activity</strong></td>
<td>Baranowski et al., 1998; Ferreira et al., 2007</td>
<td>Beets et al., 2009; Flay &amp; Allred, 2003; Flay et al., 2001; Ji et al., 2005; Lewis et al., 2012; Li et al., 2011; Snyder et al., 2010; Snyder et al., 2012; Washburn et al., 2011</td>
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<td><strong>Social-Emotional and Character Development</strong></td>
<td>Flay, 2002</td>
<td>Bell et al., 2007; Escobar-Chaves et al., 2011; Kugler et al., 2007; Tortolero et al., 2005; Tortolero et al., 2009; Weeks et al., 1995</td>
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<td><strong>Sexual Behaviors</strong></td>
<td>Bearinger &amp; Resnick, 2003; Hellerstedt et al., 2006; Kocken et al., 2006; Sieving et al., 2006; Sieving et al., 2000</td>
<td>Bell et al., 2007; Escobar-Chaves et al., 2011; Kugler et al., 2007; Tortolero et al., 2005; Tortolero et al., 2009; Weeks et al., 1995</td>
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<td><strong>Substance Use</strong></td>
<td>Abrams, 1999; Ahmed et al., 2008; Anderson, 1998; Berg et al., 2009; Brinker et al., 2009; Carvajal &amp; Granillo, 2006; Carvajal et al., 2002; Carvajal et al., 2004; Christophi et al., 2009; Connell et al., 2010; Dal Cin et al., 2009; Donath et al., 2012; DiRocco et al., 2007; Drobes, 2002; Ertas, 2007; Flay, 1993; Flay, 1999; Flay, 2000; Flay &amp; Petraitis, 1991; Flay &amp; Petraitis, 2003; Flay et al., 1994; Flay et al., 1995; Flay et al., 1999; Ford et al, 2009; Foshee et al., 2007; Giovino et al., 2009; Haug, 2001; Huang et al., 2008; Huang, Chen et al., 2009; Huang, Lee et al., 2009; Holder et al., 1999; Hover et al., 2000; Karlsson, 2006; Kear, 2002; Kleinjanz et al., 2009; Kobus, 2003; Komro &amp; Toomey, 2002; Kumar et al., 2002; Leatherdale &amp; Manske, 2005; Leatherdale &amp; Strath, 2007; Liu et al., 2009; Mohatt et al., 2004; Murnaghan, 2007; Fogg &amp; Borody, 2001; Komro et al., 2004; Midford et al., 2005; Perry et al., 2006; Perry et al., 2002; Scheier, 2001; Stigler et al., 2006; Teasdale et al., 2009</td>
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References


