Protection Motivation Theory and Adolescent Drug Trafficking: Relationship Between Health Motivation and Longitudinal Risk Involvement

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Objective To assess health protection motivation as explained by the constructs of protection motivation theory (PMT) and its association with drug trafficking over 2 years. **Methods** The sample included 817 African American youth (13–16 years old) participating in an adolescent risk-reduction program. We developed an instrument measuring the level of health protection motivation (LHPM) using factor analysis. Changes in LHPM over time were examined among drug traffickers, abstainers, initiators, and nonrisk youths. **Results** In sum, 151 participants reported selling and/or delivering drugs during the study period. The significant inverse correlation between drug-trafficking intention and health protection motivation was consistent with PMT. Changes in LHPM were strongly associated with the dynamics of behavior over 2 years. **Conclusions** Adolescent drug trafficking can be predicted by an overall level of health protection motivation. PMT and related theories should be considered in the design of drug-trafficking prevention intervention.

Key words protection motivation theory; drug trafficking; adolescent; risk reduction.

Health promotion and disease prevention research has attempted to determine methods to persuade people to adopt healthy behaviors. Many theories have been proposed to explain behavior and behavioral change (Weinstein, 1993). This study examined the effect of a model of behavioral change—protection motivation theory (Rogers, 1983; Prentice-Dunn & Rogers, 1986)—applied to adolescent drug trafficking. Research has suggested that adolescent involvement in drug trafficking may be an important pathway to illegal substance and drug use (Bush & Iannotti, 1993). However, in contrast to the extensive research and prevention programs addressing drug abuse and other problem behaviors (Ellicksin, Bell & McGuigan, 1993; Flay & Thomson, 1989; Murray, Davis-Hearn & Goldman, 1988), the psychological antecedents (motivational and explanatory) of drug trafficking have received little attention in the scientific literature to date (Li & Feigelman, 1994; Li et al., 1996).

Protection motivation theory (PMT) is a major theory of behavioral change that attempts to explain the cognitive mediation process of behavioral change in terms of threat and coping appraisal. According to PMT, environmental and personal factors combine to pose a potential health threat. The threat message initiates two cognitive processes: threat appraisal and coping appraisal. The threat appraisal process evaluates the factors associated with the behavior that potentially creates danger, including the intrinsic and extrinsic rewards accompanying the behavior, the severity of the danger, and one's vulnerability to it. The coping appraisal process evaluates one's ability to cope with and avert the threatened danger (*self-efficacy* and *response efficacy*),

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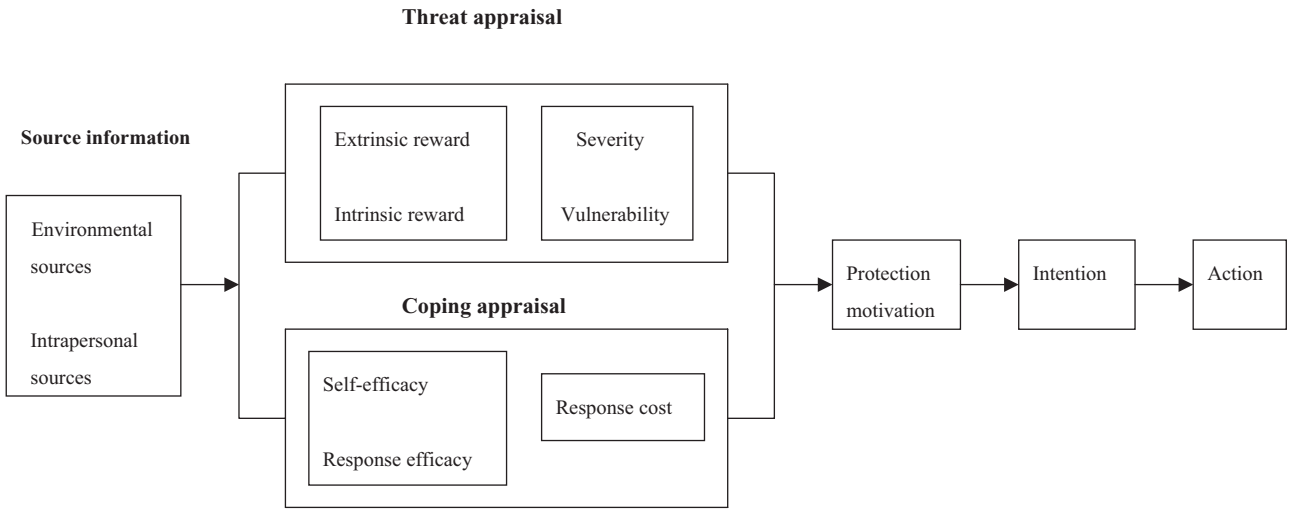

Figure 1. Protection motivation theory.

balanced with the costs associated with protective behavior (*response cost*). These two appraisal pathways combine to form *protective motivation*. Thus, the adoption of a health behavior is a temporal process from motivation, to decision, then to action. The threat to health is posited to be the stimulus to contemplate protection motivation, followed by the decision to take action or the intention to act. This intention then leads one to carry out the decision, to encounter difficulties, and to either succeed or fail. This process is illustrated in Figure 1.

Prior research has provided considerable support for the role of the major PMT constructs in predicting one's behavioral intention in a variety of behavioral domains. Sample topics include smoking cessation (Maddux & Rogers, 1983; Rogers, Deckner, & Mewborn, 1978), condom use (Tanner, Day, & Crask, 1989; Tanner, Hunt, & Eppright, 1991), cancer prevention (Helmes, 2002; Rippetoe & Rogers, 1987; Seydel, Taal, & Wiegman, 1990; Steffen, 1990), AIDS risk reduction (Aspinwall, Kemeny, Taylor, Schneider, & Dudley, 1991), exercise and diet (Plotnikoff, 1998; Wurtele & Maddux, 1987), and drinking and driving (Greening & Stoppelbein, 2000). There are also studies providing no support for PMT as a model of health behavior (Murgraff, White, & Phillips, 1999). Most of these studies have manipulated one or more of the PMT constructs and either assessed short-term impact on behavioral intention (pre–post test) or assessed their cross-sectional associations only. To date, scarce literature is found in examination of cumulative impact of all constructs within a multivariate design and longitudinal examinations (beyond 6 months) of any behavioral model including PMT. In the present study, rather than have examined the effect of each individual construct on the targeted behavioral intention and behavior, we attempted, first, to combine all seven PMT constructs to form a global measurement for the overall magnitude of health protection motivation; and, second, to examine the relationship between health protection motivation and longitudinal involvement (over 24 months) in drug trafficking.

The present analyses were conducted within the framework of a large intervention study targeting sexual risk, drug use, and drug trafficking among 817 African American youth residing in low-income communities. PMT was selected as the guiding theory for the intervention design because it expands on several models of behavioral change by specifying the constructs that represent important developmental tasks for adolescents, including extrinsic rewards and intrinsic rewards. The purpose of the project was to identify mechanisms that delay intervention decay. Evaluation of the intervention trial has been published (Wu et al., 2003). The goal of the current analyses was to assess psychological predictors of drug trafficking over a 2-year period.

Method

Sample

The study sample consisted of 817 African American families (youth and one of their parents or guardians) living in and around 35 housing developments, community centers, and recreation centers in Baltimore, Maryland. Dyads were identified and recruited from each of the 35 communities during the 1999–2000 period over three waves. Wave 1 included youth and parents from 8 sites; Wave 2, 10 sites; and Wave 3, 17 sites. For a dyad to be eligible, the youth had to spend at least 50% of his

or her time with the parent or guardian, and the child had to be 13 to 16 years of age at the time of enrollment. After a community facilitator described the program to the youth and parents, those interested were given written materials and consent forms. Although data regarding the numbers of families approached and those who decided to participate were not retained, our estimatation is that over half of those approached agreed to participate—an estimation based on the number of eligible youth within the developments and on the anecdotal reporting by the community facilitators. All adults who agreed to participate received an intervention, and over 98% of youth who enrolled participated in at least part of the intervention. Baseline assessment was administrated after recruitment was completed within a wave. This study was approved by the Institutional Review Board at the University of Maryland.

Study Design

This project was designed to evaluate three intervention strategies by combining three intervention components: a basic youth-centered intervention (Stanton et al., 1997), a parenting intervention (Stanton et al., 2000), and a booster intervention. After completing baseline assessment instruments, all youth received the basic face-to-face adolescent risk-reduction intervention, which consisted of eight sessions emphasizing decision making; goal setting; communication; negotiating; consensual relationships; and information regarding abstinence, safe sex, tobacco, alcohol, illegal drug use, and drug trafficking. Two-thirds of the participants and their families were randomly assigned to receive an additional parental monitoring intervention, which was delivered in the youth's home by the interventionist; the remaining youths were controlled for their parents' attention. The parenting intervention included a 20-min video emphasizing several concepts of parental monitoring and communication. The video was followed by two instructor-led role-playing vignettes. At the 7th and the 10th month postintervention, and again at the 13th and the 16th month, half of the youth who received the parenting intervention were randomly assigned to receive a booster intervention. The booster sessions consisted of a review of activities that had been done in the primary sessions and a few new activities with information on decision making, sexual abuse and sexual responsibility, and drug use and drug trafficking.

Administration of Questionnaires

Each youth completed a multicomponent risk assessment questionnaire—the Youth Health Risk Behavioral Inventory. The questionnaire was developed through a series of community-based ethnographic studies regarding potentially relevant risk and protective factors (Stanton et al., 1995) that contained questions assessing youth demographic information; knowledge, intentions, and past experiences of risk behaviors, including sexual risk, drug use, and drug trafficking; and perceptions regarding those behaviors. The questionnaire was administered visually via a Macintosh computer and aurally through earphones (Romer, Hornik, & Stanton, 1997). The survey was conducted in the respondents' homes and required approximately 45 min to complete. Follow-up surveys were conducted after baseline assessment at 6 months, 12 months, 18 months, and 24 months.

Measures

PMT constructs. The questionnaire contained questions measuring all seven PMT constructs for each of the behavioral domains, including sexual risk, drug use, and drug trafficking. We selected the items related to drug trafficking for this study. Responses were made on a 5-point Likert scale, with high scores indicating perceived high levels of self-efficacy; response efficacy; response cost; rewards; and severity of, and vulnerability to, the negative consequence of drug trafficking.

Risk behaviors. Youth risk behaviors were assessed by self-report using dichotomous measurement (0 = *no*, 1 = *yes*). A cross-sectional measure of drug-trafficking involvement at each assessment point was derived by combining the responses to selling and delivering drugs during the past 6 months (0 = *involved neither*, 1 = *involved either but not both*, 2 = *involved both*). A longitudinal score of drug trafficking was coded as 6 = *involved at baseline and at one or more follow-ups*, 5 = *involved at baseline and then abstained thereafter*, 4 = *initiated at 6-month*, 3 = *initiated at 12-month*, 2 = *initiated at 18-month*, 1 = *initiated at 24-month*, and 0 = *never involved*.

Intention in drug trafficking. Youth were asked how likely they would be to engage in dealing or delivering drugs in the next 6 months. Response options ranged from 1 (*very unlikely*) to 5 (*very likely*). Mean value of the responses to the two items was used as the intention score for an individual, with high scores indicating a likelihood of engagement in the near future.

Peer and family drug activities. Perceptions of peer and family drug behaviors were assessed in smoking marijuana, using crack or cocaine, injecting drugs, and selling drugs. Youth were asked how many of their friends engaged in each of these activities (1 = *none*, 5 = *most*) and how often they saw their relatives or neighbors engaging in each of these activities (1 = *never*, 5 = *very often*). Mean value of

responses to the four drug activities was used to calculate a peer drug behavior score and a family drug behavior score.

Analysis

Level of Health Protection Motivation (LHPM)

The major assumptions of PMT were that the motivation to protect oneself from danger was a linear function of the threat and coping appraisal processes (Rogers, 1983) and that the functional value was a weighted sum of the PMT constructs (Weinstein, 1993). In this study, we determined the constructs and the weights for calculation of LHPM as follows. First, an exploratory factor analysis was used to identify the seven PMT constructs, and the internal consistency of the items in a construct was estimated using Cronbach's alpha. Then, LHPM was calculated as a weighted sum of the seven construct scores. The score of a construct was the mean value of the items in that construct. The weight for a construct was the variance explained by this construct so that the resulting LHPM score emphasized difference in psychological perception regarding drug trafficking in the population.

Validation of LHPM Assessment

Test–retest correlation. The LHPM scores measured at different times for the same individual should be expected to correlate with one another. Thus, the relations between the baseline score and each of the four follow-up scores were tested by the Pearson correlation.

Construct validation. We assumed that protection motivation was best measured by behavioral intention (Rogers, 1983); thus, the LHPM was validated against self-reported intention in drug trafficking. The baseline correlation between LHPM and self-reported intention was assessed and again using follow-up data to examine the stability of the relationship over time. The correlations between self-reported intention and each of the seven constructs were tested to verify the relationships posited by PMT.

Associations of LHPM. Multiple regression was conducted to examine the association of LHPM with source variables. The source variables suggested by PMT (Rogers, 1983) included environmental sources (peer and family drug activity) and intrapersonal sources (demographics and experience with drug activity). These variables were entered into the regression model to assess the independent influence of each variable to LHPM, controlling for the variance of others in the model.

Prospective Analysis of PMT Constructs

Multiple regression analysis was conducted by age groups, with the 2-year trafficking score as the dependent variable and with the baseline PMT constructs as the independent variables. Gender was included as a covariate in each regression model. The longitudinal drug-trafficking score reflected the degree of the risk involvement over time. A regression coefficient would tell us the unique contribution of each construct measured at baseline to predict behaviors over 2 years.

Longitudinal Analysis of LHPM

Youth were categorized into one of the four groups: *nonrisk*, those who were never involved in drug trafficking; *abstainers*, those who were involved at baseline but then abstained thereafter; *initiators*, those who were not involved at baseline but then initiated involvement; and *drug traffickers*, those who were involved at baseline and at one or more follow-ups. Mean values of LHPM measured at each time were compared across the groups to examine whether behavioral dynamics were related to the changes in LHPM.

Results

Sample Characteristics

Sample characteristics with the chi-square test results for gender difference are presented in Table I, which includes baseline demographics, drug-trafficking involvement over 2 years, and participation rates at follow-up assessments. Among the 817 participants, 346 (42%) were male. The median age of the sample was 14 years. During the study period, 151 (18%) reported involvement in selling drugs and/or delivering drugs, including 71 initiators. Among these drug traffickers, there were significantly more males than there were females.

Fifty-five participants (7%) provided only baseline data. Follow-up data included 608 participants at 6 months, 595 at 12 months, 534 at 18 months, and 494 at 24 months. Overall, 283 completed all four postintervention assessments. Some of the youth who missed one assessment returned for subsequent assessments, which resulted in 82% of the sample returning for at least two follow-up assessments.

Overall Magnitude of Health Protection Motivation

Using the minimum eigenvalue criterion of 1.0, factor analysis yielded six conceptually distinct factors that explained 65% of the total variance in the 18 items measuring health protection motivation. As PMT assumes a close relationship between some of the constructs, an oblique rotation specially designed to maximize the correlation among factors was selected to extract factors (Tabachnick & Fidell, 1999). Factor loadings 0.4 or above were used when interpreting each factor. No single

Table I. Sample Characteristics

	Overall *n* (%) (*n* = 817)	Male % (*n* = 345)	Female % (*n* = 472)	*p*-values
1. Baseline Demographics				
Age				
13	308 (38)	39	37	
14	187 (23)	22	23	
15	186 (23)	22	24	
16	135 (17)	17	16	
Grade				.08
Middle school	362 (46)	49	43	
High school	433 (54)	51	57	
Suspended from school in past 6 months	83 (10)	13	8	.02
Ever had sexual intercourse	340 (43)	50	38	.0007
Ever smoked marijuana	232 (29)	30	28	
Ever used crack/cocaine	14 (2)	2	2	
Ever used other illegal drug	19 (2)	3	2	
2. Drug Trafficking Behavior over 2 Years				
Engaged at baseline	80 (10)	15	6	<.0001
Engaged at 6 months	38 (6)	11	3	.0001
Engaged at 12 months	28 (5)	9	2	.0006
Engaged at 18 months	39 (7)	13	4	<.0001
Engaged at 24 months	20 (4)	9	1	<.0001
Time onset of drug trafficking				<.0001
at baseline	80 (10)	15	6	
at 6 month	25 (3)	6	1	
at 12 months	14 (2)	3	1	
at 18 months	23 (3)	4	2	
at 24 months	9 (1)	2	0	
Never involved	666 (82)	71	89	
3. *Follow-up Participation Rates*				
6 months	608 (74)	73	76	
12 months	595 (73)	69	75	.05
18 months	534 (65)	59	70	.001
24 months	494 (60)	56	64	.03
Baseline assessment only	55 (7)	9	5	.03

All *p*-values less than 0.1 for testing gender differnce were listed.

item was loaded on more than one factor. Based on the prevailing construct of items in the cluster, the six factors were labeled as Response Cost, Extrinsic Reward, Efficacy, Intrinsic Reward, Severity, and Vulnerability. The Cronbach alpha values of these constructs ranged from 0.43 to 0.89. The four-item efficacy construct was subsequently factored again using the same procedure. The minimum eiganvalue criterion of 1.0 suggested a two-factor solution, where Factor 1 explained 55% of the total variance in the efficacy scale. These two factors were labeled as Self-Efficacy and Response Efficacy. The results of the factor analysis are presented in Table II. Accordingly, individual scores of LHPM are calculated as

LHPM = −2.43 Extrinsic Reward − 1.81 Intrinsic Reward + 1.54 Severity − 1.35 Vulnerability + 2.02 (0.55 Self-Efficacy + 0.45 Response Efficacy) − 2.58 Response Cost,

where the weights for each construct in the formula were based on the variance explained by this construct and where the sign was determined by Pearson correlations.

Validation of LHPM Assessment

The LHPM scores measured for the same individual at different times were significantly correlated. The Pearson coefficients were r (524) = .37, r (498) = .31, r (486) = .34, and r (438) = .33, with $p < .0001$ over the four intervals (6 months, 12 months, 18 months, and 24 months).

Table II. Factor Analysis for the PMT Constructs Regarding Drug Trafficking Using 817 Baseline Data

	Loading	Variance	α
F1 – Response Cost		2.58	.79
I need to sell drugs to get enough money for myself.	.83		
I need to sell drugs to get enough money for my family.	.87		
Boys need to sell drugs to get enough money for a girlfriend.	.75		
Dealing or selling drugs is exciting.	.63		
F2 – Extrinsic Rewards— I often see people in my block . . .		2.43	.78
sell or run drugs.	.77		
smoke marijuana.	.78		
use crack cocaine.	.80		
use drugs with needles.	.75		
F3 – Efficacy		2.02	.65
Self-Efficacy			
If a friend asked me to deliver drugs I could say no.	.64		
If a relative asked me to deliver drugs, I could say no.	.66		
If someone on the street asked me to deliver drugs, I could say no.	.68		
Response Efficacy			
If I refuse to deliver drugs, drug dealers will not bother me.	.67		
F4 – Intrinsic Rewards		1.81	.89
I feel good about dealing drugs.	.93		
I feel good about delivering drugs.	.92		
F5 – Severity		1.54	.56
Bad things happen to families of kids who sell drugs.	.79		
Kids who sell drugs will get hurt.	.80		
F6 – Vulnerability		1.35	.43
I will get in trouble with the police whether or not I deliver drugs.	.73		
As long as I don't deal drugs I probably won't get hurt.	.80		

There was a strong inverse correlation between LHPM and self-reported intention at baseline. This relationship, assessed by follow-up data, remained significant over 24 months. With regard to examination of each PMT construct, the relationship between intention and each of the seven constructs was verified through the signs and the quantities of the Pearson coefficients: 33 out of the 40 pairs of correlations were significant. These results are presented in Table III. As expected, Extrinsic Reward, Intrinsic Reward, and Response Cost were positively correlated to intention; and Self-Efficacy, Response Efficacy, and Severity were negatively correlated to intention.

As hypothesized, a multiple regression using baseline data indicated that LHPM was strongly associated with

Table III. Pearson Correlation Coefficients with Self-Reported Intention in Drug Trafficking at Baseline and at Follow-Up

	Self-Reported Intention in Drug Trafficking				
	Baseline ($n = 755$)	6 months ($n = 566$)	12 months ($n = 544$)	18 months ($n = 526$)	24 months ($n = 474$)
LHPM	−.36****	−.54****	−.48****	−.54****	−.52****
Extrinsic Reward	.06	.14***	.09*	.13**	.00
Intrinsic Reward	.34****	.44****	.40****	.48****	.52****
Severity	−.10**	−.14***	−.06	−.05	−.08
Vulnerability	.13***	.16***	.13**	.07	.12**
Self-Efficacy	−.24****	−.40****	−.30****	−.40****	−.41****
Response Efficacy	.00	−.14***	−.23****	−.17****	−.20****
Response Cost	.39****	.46****	.43****	.47****	.47****

n = minimum number of observations available in correlation computation at each time assessment.
*$p < .05$, **$p < .01$, ***$p < .001$, ****$p < .0001$.

Table IV. Multiple Regression Analyses for the 2-Year Drug Trafficking Score by Age Group

Independent Variable	Age 13 ($n = 279$)		Age 14 ($n = 176$)		Age 15 ($n = 171$)		Age 16 ($n = 129$)	
	β	*T*	β	*T*	β	*T*	β	*T*
Extrinsic Rewards	.23	3.02**	.09	1.06	.08	.78	.19	1.31
Intrinsic Rewards	.44	3.51***	.47	3.99***	.70	5.26****	.42	1.90*
Severity	−.13	−1.28	−.17	−1.31	−.28	−2.07*	−.47	−2.28*
Vulnerability	.03	0.42	.06	.71	.05	.46	−.20	−1.07
Self-Efficacy	.15	1.13	−.24	−1.70	.13	.80	.02	.09
Response Efficacy	.08	1.11	.04	.51	.00	−.04	−.03	−.19
Response Cost	.02	0.18	−.07	−.46	.59	3.94***	.63	2.34*
Gender (boy vs. girl)	.44	2.71**	.73	3.39***	.79	3.37***	.56	1.48
R^2	.13		.24		.32		.21	

The 2-year drug-trafficking score ranges from 0 to 6, with higher scores indicating more risk involvement longitudinally. The independent variables were measured using baseline data. *n* = number of observations available for a regression analysis.
*$p < .05$, **$p < .01$, ***$p < .001$, ****$p < .0001$.

prior drug activity and environmental sources. Lower level of health motivation was correlated to prior involvements of drug activity (β = −1.39, $T = -5.46$, $p < .0001$), peer drug activity (β = −1.56, $T = -5.72$, $p < .0001$), and family drug activity (β = −1.8, $T = -7.61$, $p < .0001$). This analysis controlled for age and gender.

Predictability of Drug Trafficking Behaviors Over 2 Years

Multiple regression analyses were conducted separately by age group. The regression coefficient β, *T* statistics, and R^2 are presented in Table IV. A coefficient provides an estimate of the variance uniquely attributable to the longitudinal trafficking behavior presented in 2 years. Among older teens (ages 15–16), perceived severity significantly reduced the chance of risk involvement, and perceived response cost (the economic motivation) significantly contributed to the prediction of drug trafficking. Extrinsic reward (community influence) was perceived only by younger teens (aged 13). The effects of perceived intrinsic rewards were significant among all youth aged 13 to 16.

Mean values of LHPM over time were compared across the four groups with different behavioral characteristics (*nonrisk*, *initiator*, *abstainer*, and *drug trafficker*). The results are presented in Figure 2. Youth who never

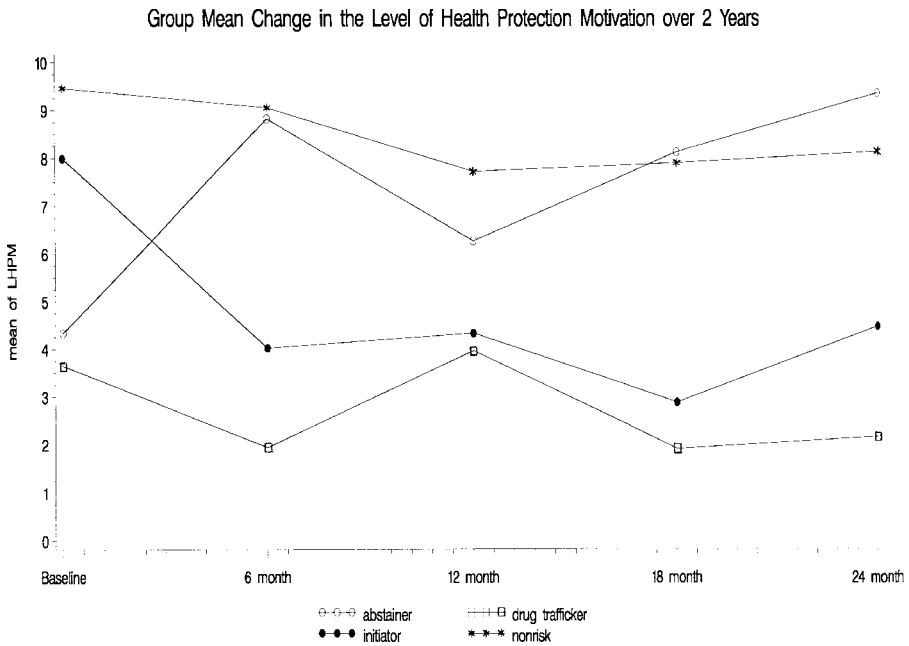

Figure 2. Youth were categorized into four groups based on their behaviors during the study period: *nonrisk* ($n = 666$), *abstainer* ($n = 56$), *initiator* ($n = 71$), and *drug trafficker* ($n = 24$). The vertical scale represents group means of level of health protection motivation (LHPM), with higher values indicating higher levels of health motivation. Observation numbers available for LHPM computation at the five assessment times were 616, 461, 445, 434, and 396 for *nonrisk* group; 53, 25, 27, 19, and 15 for *abstainer*; 64, 61, 55, 58, and 50 for *initiator*; 22, 19, 17, 15, and 13 for *drug trafficker*.

committed drug trafficking basically remained the highest in health motivation level, whereas the drug traffickers retained the lowest level of health motivation over time. It is interesting to note that among youth who had not been involved in drug trafficking at baseline, those with a relatively lower level of LHPM were more likely to become initiators later, and their LHPM scores would subsequently decline to levels similar to those of drug traffickers. Among youth who reported a history of drug trafficking at baseline, those with a relatively higher level of LHPM would discontinue drug trafficking; subsequently, their LHPM scores increased to levels similar to those of the nonrisk group. Figure 2 also suggests a cutoff such that youth abstain from drug trafficking when their LHPM scores are higher than 6.3 and that youth engage in drug trafficking when their LHPM scores are lower than 4.5 (see Figure 2).

Discussion

Most research to date on health behavioral change using the PMT model has examined the impact of individual constructs on the targeted behaviors in a variety of behavioral domains. As the effect of one PMT construct may depend on the values of other relevant constructs in the model and as the contribution of each construct to the motivation level would be different, the current study explored an analytic approach to evaluate the cumulative effect of all constructs on behavior. We developed a scale measuring the overall level of health protection motivation, incorporating all of the constructs posited by PMT. Our findings—which are consistent with PMT—show that low levels of health protection motivation are strongly correlated with high levels of drug-trafficking intention, cross-sectionally at baseline and longitudinally over 24 months.

The ability to detect and interpret the relationship between health motivation and risk involvement is dependent on the ability to measure health motivation effectively. The LHPM scale developed around the PMT constructs clearly distinguished youth with drug-trafficking behavior from those without such behavior. Furthermore, the changes in LHPM over time among the four youth groups (*nonrisk, abstainer, initiator*, and *drug trafficker*) demonstrate that the LHPM scale is a robust measurement of motivation and a sensitive longitudinal predictor of behavior. These results not only reflect the reliability of the LHPM scale but indicate the important role of psychological factors in the dynamics of behavior. Some research has not validated the ability of PMT measurements to differentiate between risk groups and nonrisk groups (Murgraff et al., 1999). Recently, Ogden (2003) expressed concerns regarding the overall usefulness of social cognitive models. However, our data provide strong evidence that PMT and related theories should be considered in the design of drug-trafficking prevention intervention.

The rate of drug trafficking was 10% at baseline and was increased by 8% within 24 months. Involvement in trafficking was strongly associated with the social environment—in particular, peer and family drug activity. This finding emphasizes the importance of an encouraging environment for experimentation, particularly among low-income urban African American communities. Interventions targeting this population, especially younger teens, should be community-based with an orientation toward the family and the youth's peer and social groups.

Data reveal that barriers to abstain from drug trafficking, such as loss of income, explain the greatest amount of variance in motivational level. This finding and the strong relationship between perceived response cost and risk involvement among older teens indicate that economic motives are important factors associated with drug-trafficking activities in this age group, a conclusion that is consistent with previous research results (Dembo et al., 1993; Feigelman, Stanton, & Ricardo, 1993; Li et al., 1996). Analyses of the social, legal, and economic forces in the sales of illegal drugs have underscored the utility of juveniles to the market. Adolescents are less likely to be confined and are more likely to be released expeditiously if arrested than are older traffickers, who are dealt with in the adult judicial system, not the juvenile (Leviton, Schindler, & Orleans, 1994).

Although self-efficacy is strongly related to intention to refuse trafficking, it does not significantly predict actual action. Insignificant effects of the efficacy constructs on behavior suggest that drug education efforts designed to discourage experimentation by emphasizing the need to be able to *just say no* are insufficient. The intense economic motivation among adolescent drug traffickers may provide an opportunity for alternative strategies to alter this behavior.

The effect of perceived severity on deterring drug-trafficking intention and behaviors is robust and is similar to that found in studies focusing on the areas of cancer-related preventive behaviors (Rippetoe & Rogers, 1987; Seydel et al., 1990). However, research in the areas of smoking, exercise, and risky sexual behaviors (Maddux & Rogers, 1983; Van der Velde & Van der Pligt, 1991; Wurtele & Maddux, 1987) found no association, motivating some researchers to suggest that severity

should be dropped from analyses (Wurtele & Maddux, 1987). The life-threatening implications of cancer and the serious consequences of drug trafficking suggest that the inconsistent effects of the severity construct are related to perceived level of psychological threat of the adverse outcomes. That severity was perceived to be important by older youth may reflect their recognition that, if arrested, the consequences in the adult judicial system are more significant than those in the juvenile judicial system (Leviton et al., 1994).

Contrary to the prediction of the PMT model, perceived personal vulnerability to drug trafficking is positively correlated with behavioral intention. The result is similar to the findings of studies regarding smoking intention (Rogers et al., 1978) and drinking and driving (Greening & Stoppelbein, 2000). In fact, this outcome, which violates the posited decision-making process, has received attention and may be explained as a boomerang effect, as described by Rogers (1983). If self-efficacy and/or response efficacy are high, then increases in perceived vulnerability to the danger will increase intention to adopt a health behavior to avert the threatened danger. If self-efficacy and/or response efficacy are low, increasing perceptions of vulnerability may result in a sense of futility, actually reducing intentions to comply with the health recommendation. Cumulative evidence suggests that among the PMT constructs, vulnerability could either increase or decrease intention to engage in protective behavior. We speculate that the relationship between vulnerability and behavioral intention might depend on the type of health threat.

This study does have some limitations. First, the PMT constructs and LHPM scale are valid for this minority sample only, so the results may not be generalized to different geographic areas and cultural settings. Second, the PMT constructs accounted for 21% to 32% of the variance in motivation for older teens' drug trafficking. However, the PMT constructs only accounted for 13% of variance among youth aged 13. A substantial proportion of preteen's motivation in drug trafficking remains unexplained. In this study we did not assess intrapersonal factors, such as sensation seeking, which may also influence involvement in drug trafficking (Black & Ricardo, 1994).

In conclusion, the finding that adolescent drug trafficking can be predicted by an overall level of health protection motivation provides strong justification for the continued use of PMT and related models as guides for intervention design and analysis. Such an analytic approach enables identification of the overall effectiveness of the theoretical model as well as the critical constructs involved in the risk-behavior decision making of adolescents. An important next step is to examine the application of the LHPM analytic approach to other problem behaviors in different populations.

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