

Stages of Sexual Readiness and Six-Month Stage Progression Among African American Pre-Teens

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We examined the range of sexual intentions and behaviors preceding sexual initiation among 211 African American pre-teens assigned to the control arm of a longitudinal community-based intervention trial. Stage of sexual readiness was assessed using the stage of change construct from the Transtheoretical Model, and patterns of stage movement during a 6-month period were examined. Overall, 90% of participants were in precontemplation at baseline, with the proportion of participants in this stage declining with each year of age. There was substantial stability in stage of sexual readiness during the 6-month period (87% stable). While definitive conclusions regarding exact patterns of movement are not yet possible, stage movement does not appear to be linear for all pre-teens, and there is evidence of both stage progression and regression. We present emerging patterns of stage movement, which suggest potential variation by age, gender, and baseline stage, and discuss potential implications.

The negative consequences of unsafe sexual intercourse among adolescents have been well-documented and represent a significant public health problem in the United States (Alan Guttmacher Institute, 2004; Centers for Disease Control and Prevention [CDC], 2000, 2005; Valleroy, MacKellar, Karon, Janssen, & Hayman, 1998; Weinstock, Berman, & Cates, 2004). National data indicate that nearly half of all high school students initiate sexual intercourse prior to graduation, and a significant minority initiate prior to age 13 (CDC, 2006). African American students are more likely to report sexual initiation by age 13 than Hispanics or Whites (16.5%, compared to 7.3% and 4.0%, respectively). Because these are school-based data, they are probably a minimum estimate of the proportion of young people engaging in sex prior to or very early in adolescence.

Early age of sexual debut has been identified as a significant predictor of both initial and subsequent sexual risk behaviors and related health outcomes, including lack of condom use, multiple and high-risk sexual partners later in life, recurrent STDs, and cervical cancer (Brooks-Gunn & Furstenberg, 1989; Coker et al., 1994; Greenberg, Magder, & Aral, 1992; Kotchick, Shaffer, Forehand, & Miller, 2001; National Campaign to Prevent Teen Pregnancy,

2003; Rosenthal, Biro, Succop, Cohen, & Stanberry, 1994; St. Lawrence & Scott, 1996). Behavior at first intercourse has also been shown to be an important determinant of subsequent behavior, as condom use at first intercourse has been associated with a 20-fold increase in lifetime condom use (Miller, Levin, Whittaker, & Xu, 1998).

While the age and circumstances of sexual initiation appear to be important predictors of lifetime sexual health, the pathways by which individuals establish sexual activity are not well understood. In fact, very little is known about the process of sexual initiation among adolescents (Brooks-Gunn & Furstenberg, 1989; di Mauro, 1995; Goodson, Evans, & Edmundson, 1997; Miller & Moore, 1990). There has been limited prospective research on the development of sexual attitudes, intentions, and behaviors among children and adolescents (for exceptions, see Kinsman, Romer, Furstenberg, & Schwarz, 1998; O'Sullivan & Brooks-Gunn, 2005; Rosenthal et al., 2001). The majority of research has focused on correlates of established sexual risk behavior (Brooks-Gunn & Furstenberg; Goodson et al.). Little is known regarding how these factors interact to influence, directly and indirectly, the development of adolescent risk or health behavior (Kotchick et al., 2001). Furthermore, studies have principally focused on the single outcome of "sexually active" versus "sexually inactive" and have largely failed to capture the attitudes and behaviors that precede initiation (Miller et al., 1997).

Recent data suggest that this dichotomy is insufficient for understanding the range of adolescent behavior, and that

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contrary to earlier beliefs (Brooks-Gunn & Furstenberg, 1989), sexual initiation is a process. Miller et al. (1997) identified five distinct patterns of sexual experience among a sample of nearly 900 African American and Latino 14- to 17-year-olds. Adolescents in this study who would have traditionally been characterized simply as “sexually inactive” actually comprised two different groups in terms of behaviors and expectations: *delayers* and *anticipators*. Neither group had engaged in sexual intercourse, but anticipators reported a greater than 50% expectation of doing so within the next year. Anticipators were significantly more likely than delayers to have engaged in pre-coital sexual activities, such as kissing, rubbing, and touching. Because this study was cross-sectional, researchers could not determine if either expectations or behaviors were predictive of subsequent behavior.

A 1998 prospective study conducted among sixth grade students found that adolescents’ intention to initiate sexual activity within the next year was the strongest predictor of initiation (Kinsman et al., 1998). Further, in one of the few studies that has examined adolescent decision-making, Rosenthal et al. (2001) found that both the variables influencing sexual initiation and self-reported reasons for initiation vary significantly between females who initiate sex prior to age 15 and those who initiate at age 17 or older. A separate prospective study with 12- to 15-year-old females found that changes in sexual thoughts precede the initiation of a range of new sexual activities, including breast fondling, genital contact, and intercourse (O’Sullivan & Brooks-Gunn, 2005). The most significant changes in sexual cognitions in this study occurred prior to initiation of the pre-coital behaviors examined, rather than coitus. Taken together, these findings suggest that sexual initiation is a process which may vary by age and involves an evolution of attitudes and behaviors.

Research on sexual initiation among adolescents has suffered from two principal methodological limitations. First, the majority of studies have been cross-sectional, precluding conclusions about causal relationships between risk or protective factors and behaviors (Brooks-Gunn & Furstenberg, 1989; Goodson et al., 1997; Kotchick et al., 2001). Second, research has been conducted largely in the absence of a theoretical or conceptual framework (Goodson et al.; Kotchick et al.). Because of the complexity of adolescent sexual behavior and the need to understand the longitudinal process of sexual initiation, the theoretical framework for exploring these behaviors must be both comprehensive and dynamic.

The Transtheoretical Model (TTM), which integrates principles of behavior change from over 300 theories of psychotherapy, may provide a useful framework for examining the adoption of sexual behavior (Prochaska, Redding, & Evers, 2002). The TTM and its precursors propose that behavior change is a process that involves progression through a predictable series of steps. Horn (1976), in one of the earliest models of behavior change, posited that there were four overall processes related to personal

choice behaviors: *initiation*, *establishment*, *maintenance*, and *cessation*. The model proposed several phases of the cessation process, which were further explored and developed by Prochaska, DiClemente, & Norcross (1992) into the construct of “stages of change.” The TTM posits that when attempting to modify behavior, individuals progress through five stages of change:

1. precontemplation, the period when the individual has no intent to change;
2. contemplation, the period when the individual is seriously thinking about change, but has not made a commitment to act;
3. preparation, the period when the individual combines intention to change with small behavioral changes;
4. action, the period when people change behavior; and
5. maintenance, the period when people have maintained behavior change for more than 6 months.

When applying the TTM to the modification of risk behaviors, researchers have found that movement through these stages does not always occur in a linear manner, as individuals often recycle through stages before maintenance is reached. The time an individual spends in each stage may also vary. Generally, precontemplation and maintenance have been found to be the most stable stages, with people typically remaining in these stages for much longer periods of time than they spend in the intermediate stages, when behavior change is actively occurring (Prochaska et al., 1992; Prochaska et al., 2002).

Although the TTM has been applied successfully to the modification of a wide range of problem behaviors, including smoking, substance abuse, high-fat diets, unsafe sex, and sedentary lifestyles (Grimley, Riley, Bellis, & Prochaska, 1993; Nigg et al., 1999; Prochaska et al., 1992; Schnell, Galavotti, Fishbein, & Chan, 1996), little has been done to examine its relevance for predicting and explaining the *initiation* of behavior, the initial process in Horn’s (1976) model. A few studies have attempted to adapt the TTM to the initiation of tobacco use among adolescents (Elder et al., 1990; Prokhorov et al., 2002; Stern, Prochaska, Velicer, & Elder, 1987). Each study identified distinct stages of smoking acquisition among adolescents, and Prokhorov et al. (2002) found the stages to be predictive of smoking acquisition within 12 months. Further understanding of how models such as the TTM, initially applied to “treatment,” can be applied and modified to the initiation of behavior could significantly advance research to understand, and ultimately prevent, the establishment of sexual risk behaviors.

If teens progress through a series of stages prior to first intercourse, and if behavior at first intercourse is predictive of lifetime sexual health or risk behavior, then understanding and influencing the various pathways to sexual initiation could lead to significant improvements in health. The goal of this study was to contribute to an understanding of the stages of change related to the initiation of sexual behavior among adolescents who face the greatest risk of negative health outcomes, African American adoles-

cents who initiate sexual activity prior to age 13. Once the structure of behavior change (i.e., stages of change) for sexual initiation is better understood, research can better address how children and adolescents progress through these stages and how to intervene effectively. Specifically, this study examined the distribution of stages of sexual readiness among a sample of African American pre-teens (9 to 12 years of age) and the patterns of progression through these stages within a 6-month period.

METHOD

Procedure and Participants

Data for this analysis were originally gathered as part of the *Parents Matter!* intervention trial. The *Parents Matter!* program is a community-based family intervention designed to promote positive parenting and effective parent-child communication about sexuality and sexual risk reduction (Ball, Pelton, Forehand, Long, & Wallace, 2004). Participants in the trial were African American parents or guardians and their 4th or 5th grade children. Recruitment was conducted through a convenience sample of schools, housing authorities, community-based organizations, and churches at three sites in the Southeast (Clark County, GA; Atlanta, GA; Little Rock, AR). Sites were selected through a competitive funding process but were required to target high-risk minority populations. Parent/child dyads were randomly assigned to one of three interventions: an enhanced communication and parenting intervention, a brief communication and parenting intervention, or a general health intervention. The trial began in early 2001 and is ongoing.

Both the parent and the child complete structured interviews at baseline, at post-intervention, at 6 months, and then at 1, 2, and 3 years. For this analysis, data were extracted from the child's baseline and 6-month assessments. These assessments were conducted using Audio Computer Assisted Self-Interviews (ACASI). Questions were administered via audio headphones as they appeared on the computer screen. Participants were asked to enter responses directly into the computer, and children were separated from their parents to ensure privacy while completing the survey. Study staff provided initial instructions and were available to answer questions. Each dyad was given \$25 for time and effort at each assessment, and each child was given a small gift.

Because the aim of this study was to understand the natural history of sexual initiation, we limited data analysis to the children in the control arm of the intervention trial. This was designed to prevent potential confounding effects of the intervention. Analyses for this study are within the scope of secondary research questions proposed in the *Parents Matter!* study protocol, which was reviewed and cleared by the Institutional Review Boards of CDC and each study site. No additional burden or risks were placed upon participants in the trial, and data files utilized for secondary analysis contained no identifying information.

Eligible participants in the study were the 366 pre-teens (9 to 12 years of age) randomly assigned to the control arm of the *Parents Matter!* trial. To be included in the study, children had to be in the 4th or 5th grade, 12 or younger at recruitment, English-speaking, and have lived continuously with the African American parent or guardian enrolled in the study for at least the past three years.

Measures

The *Parents Matter!* survey instrument was comprised of questions related to a wide range of individual, family, and peer-related variables, as well as measures related to the child's sexual and other risk behaviors. The instrument was assessed for cultural relevance, readability, and comprehension through qualitative pilot research with members of the target population, members of community advisory boards, and elementary school teachers with experience teaching this population (Ball et al., 2004).

Demographics. Basic demographic information was obtained from the child and the participating parent. Children were asked about their gender, race/ethnicity, and school grade, and parents were asked for the child's date of birth.

Sexual thoughts and intentions. Several questions were used to assess the child's self-reported readiness and intentions to engage in sexual activity with members of the opposite sex. Due to the sensitive nature of the questionnaire, skip patterns were used to ensure participants were not asked inappropriate or irrelevant questions. Therefore, prior to proceeding to more detailed questions about sexual intention, all participants were asked how often they had thought about having sex with a boy/girl. This item was rated on a 4-point scale, with responses ranging from 1 (*I've never thought about it*) to 4 (*I've thought about it lots of times*). A fifth response choice was offered that read (*I'm not sure or I don't know what sex is*).

Participants who reported having thought about sex at least once were asked about readiness to initiate and likelihood of initiation. A child's readiness to initiate was measured with a single item, "I think I'm ready to have sex." Responses ranged from 1 (*not at all true*) to 3 (*very true*). A single item was used to assess the child's likelihood of sexual initiation within the next year, with responses ranging from 1 (*I'm sure that I won't have sex in the next year*) to 5 (*I'm sure that I will have sex in the next year*).

Pre-coital sexual behaviors. Participants were asked a series of yes/no questions regarding pre-coital sexual activity, all beginning with, "Have you ever . . ." All children were asked about holding hands, kissing, consensual touching under clothing, and consensual exposure and touching of private parts. Consensual behavior was assessed by asking about willing engagement in the specified behavior, which was defined for participants, as "you gave permission or said it was OK, and did it because you wanted to, not because someone made you." For the question regarding touching of private parts, a confirmatory question was asked to ensure engagement in this behavior was intentional rather than accidental.

Sexual intercourse. Only participants who answered “yes” to questions regarding exposure or touching of private parts were asked about initiation of sexual intercourse. A single yes/no question measured whether a child had ever engaged in willing penile-vaginal intercourse, which was defined for participants as, “when a boy or man puts his penis in a girl or woman’s vagina.”

Stage of sexual readiness. The outcome measure of interest in this study was the child’s stage of sexual readiness, a measure derived from self-reported sexual thoughts, intentions, and behaviors. Because the TTM had not previously been applied to the process of sexual initiation, there was no existing measure of “stage of sexual readiness.” Therefore, we utilized a newly-developed algorithm to assess the stages of change construct. The measure builds upon the previously described typology of adolescent sexual experience developed by Miller et al. (1997) and incorporates sexual expectations and pre-coital behaviors. Because this investigation focused on sexual initiation, a one-time behavior, the measure includes only stages through action. The algorithm, depicted in Figure 1, is comprised of eight questions.

First, all participants who reported having willingly engaged in penile/vaginal intercourse were staged in *Action*. Next, the two questions on frequency of sexual thoughts and likelihood of sexual initiation were utilized to

distinguish *Precontemplators* from those in later stages. All participants who reported that they had “never thought about having sex” or who were “unsure what sex is” were staged in *Precontemplation*. Additionally, participants who selected either of the first two response categories on the intention question, “I’m sure that I won’t have sex in the next year” or “I probably won’t have sex in the next year,” were staged in *Precontemplation*. All participants reporting an even or greater chance of initiating intercourse within the next year were classified as being in later stages of initiation.

We used responses to the pre-coital behavior questions to categorize remaining participants. According to the TTM, *Preparation* is the stage that combines intention to change with small behavioral changes, or “preparatory attempts” (Prochaska et al., 1992). For the purposes of this study, a preparatory attempt was defined as advanced pre-coital behavior, including consensual touching under clothing and consensual exposure of or touching of private parts.

The algorithm then divides those intending to initiate sex, or the “anticipators” by the Miller et al. (1997) typology, into two groups: those who anticipated initiating within the next year but had not made preparatory attempts, and those who anticipated initiating within the next year and had made preparatory attempts. The former group was staged in *Contemplation*, and the later group was staged in *Preparation*.

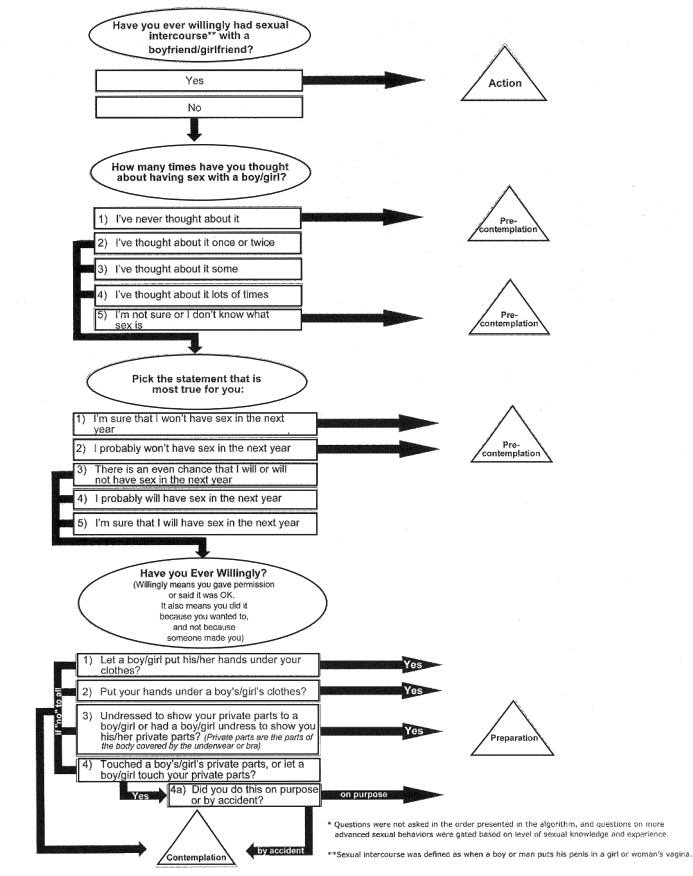
The reliability of the algorithm in measuring stage of change was evaluated through an examination of the consistency of response for all participants at baseline (time 1) and at 6-months follow-up (time 2). The results of that analysis are described in detail elsewhere, but in general, we found a high degree of consistency, with over 90% of participants providing consistent responses on all stage indicators (Butler, Miller, & Holtgrave, under review).

Self-relevant thought. The precontemplation stage of initiation is defined only by the lack of intention to initiate sexual intercourse, and may therefore comprise adolescents with a wide range of behaviors and knowledge. To differentiate between adolescents who had begun to think about having sexual intercourse and those for whom sexual thought was not yet relevant, we derived a measure of self-relevant thought from the item measuring frequency of sexual thought. Any response indicating a participant had “thought about having sex with a boy/girl,” with frequency ranging from *once or twice* to *lots of times*, was defined as having engaged in “self-relevant thought.” All responses of *I’ve never thought about it* or *I’m not sure or I don’t know what sex is* were defined as the absence of self-relevant thought.

Data Analyses

We imported the data into SPSS, version 11.0, and SAS, version 9.0, for analysis. We created a new variable for stage of change and coded data according to the specified algorithm. A new variable was also created to indicate the presence or absence of self-relevant sexual thought.

Figure 1: Algorithm for Assessing Stage of Sexual Readiness*



Subsequent analyses were restricted to participants who completed assessments at time 1 and time 2. We compared participants available at time 1 and time 2 to participants lost to follow-up on key demographic variables and baseline stage of sexual readiness using chi-square and Fisher's exact tests. In addition, basic descriptive statistics were created for participants in each stage of change, and differences by gender, school grade, and age were explored using frequency distributions and Fisher's exact tests.

To examine patterns of progression, we created a 4x4 matrix of stage at baseline by stage at 6 months to depict movement from each stage. We also created a new variable to indicate whether a participant had progressed, regressed, or remained in their baseline stage at time 2. To determine if stage at baseline was predictive of sexual initiation within 6 months, we planned a chi-square analysis. However, because only four participants initiated sexual intercourse during the study period, power limitations precluded reliable analysis.

We performed bivariate analyses to assess the association between progression and key demographic variables. To assess further the demographic factors related to progression, we analyzed patterns of progression for all participants in precontemplation at baseline by race and gender.

Finally, to determine if the pre-contemplation group could be divided into meaningful subgroups of adolescents who differ in cognitive progression toward sexual intent, we examined frequency of self-relevant thought for all participants in this stage of change. We then examined the association between self-relevant thought and advanced pre-coital behaviors, as well as stage progression, using frequency distributions and Fisher's exact tests.

RESULTS

Sample Description

Of the 366 pre-teens assigned to the control intervention, 213 (58%) completed assessments at both time 1 and time 2. The high loss to follow-up was primarily the result of

low rates of participation in the control intervention. The retention rate from baseline to intervention in the control arm was 70%, compared to retention rates in the full and brief intervention arms of 87% and 76%, respectively. The lower retention rates for the brief and control intervention may be related to the fact that both were single-session interventions, offering only one opportunity for trial participation.

The 213 participants available at time 1 and time 2 did not differ significantly from the 153 participants lost to follow-up on key demographic variables or on baseline stage of sexual readiness. Two participants were excluded due to insufficient time spent completing assessments, which suggested lack of full participation.

The final cohort consisted of 211 pre-teens, including 114 females (54%). Ninety-seven percent of the sample identified themselves as African American, and the remaining three percent identified themselves as biracial, American Indian or Alaskan Native, or other. All participants were between the ages of 9 and 12 years ($M = 10.06$, $SD = .793$).

Baseline Stage of Sexual Readiness

Over 99% of participants were categorized into stages of sexual readiness according to the algorithm. Only one participant could not be staged, due to missing data on stage indicators. As depicted in Table 1, the majority of pre-teens in this sample (90%) were in precontemplation at baseline, followed by a roughly equal number of participants in both contemplation and preparation. Only one participant was in the action stage at baseline.

Age was significantly related to baseline stage (Fisher's exact $p = .0035$), with the percentage of participants in precontemplation declining with each year of age. Differences in baseline stage by gender and grade were not statistically significant.

Overall Patterns of Stage Movement

The majority of participants (87%) were in the same stage of sexual readiness at time 1 and time 2. Of the participants

Table 1. Baseline Distribution of Stages of Sexual Readiness Overall and by Gender, Age, and School Grade

Characteristic	Stage of Sexual Readiness									
	Pre-contemplation		Contemplation		Preparation		Action		Total	
	n	%	n	%	n	%	n	%	N	%
Total	190	(90.0)	10	(4.7)	9	(4.3)	1	(0.5)	210	(100)
Sex										
Female	106	(93.0)	4	(3.5)	4	(3.5)	0	(0.0)	114	(100)
Male	84	(87.5)	6	(6.3)	5	(5.2)	1	(1.0)	96	(100)
Age										
9	52	(98.1)	1	(1.9)	0	(0.0)	0	(0.0)	53	(100)
10	91	(92.9)	2	(2.0)	4	(4.1)	1	(1.0)	98	(100)
11	43	(82.7)	6	(11.5)	3	(5.8)	0	(0.0)	52	(100)
12	4	*	1	*	2	*	0	*	7	(100)
Grade										
4th	89	(93.7)	2	(2.1)	3	(3.2)	1	(1.1)	95	(100)
5th	101	(87.8)	8	(7.0)	6	(5.2)	0	(0.0)	115	(100)

* Numbers too small for meaningful percentage estimates.

changing stages from time 1 to time 2, a slightly higher percentage progressed (8%) than regressed (5%) in stage of sexual readiness.

Table 2 depicts patterns of movement from time 1 to time 2. Low frequencies in advanced stages and limited movement precluded valid statistical analysis of these patterns, but movement did vary descriptively by stage at baseline. Among participants in pre-action stages, stability was highest among participants in precontemplation at time 1. Among individuals who progressed in stage from time 1 to time 2, participants were somewhat more likely to move a single, rather than multiple, stages forward. Among those who regressed in stage, roughly equal numbers of participants regressed back to precontemplation from contemplation and preparation.

Analyses by Gender and Age

A greater percentage of males changed stages from time 1 to time 2 than did females (18% versus 9% respectively), although this difference was not statistically significant ($p = .12$). As depicted in Table 3, exact patterns of movement also differed by gender. Males were more likely to progress than regress, while females progressed and regressed in equal proportions. Additionally, all females who progressed moved only one stage forward, while some males advanced two or three stages. Age was significantly associated with stage movement (Fisher's exact $p < .05$), and as depicted in Table 4, the percentage of participants moving forward and backward increased with each year of age.

We examined patterns of movement for the 190 participants in precontemplation at time 1 by age and gender. Over 95% of females who were precontemplators at baseline remained in that stage throughout the study period, regardless of age. However, we did not find this stability among males. While 100% of 9-year-old males in precontemplation at baseline remained in that stage, the percentage of males remaining stable in precontemplation dropped to 88% at age 10 and 78% at age 11. The number

of 12-year-olds in the sample was too small to allow interpretation.

Analysis of Self-Relevant Thought Among Precontemplators

Only a minority of precontemplators (16%) had begun thinking about sex in a self-relevant manner. However, these 30 participants were more likely to report advanced pre-coital behaviors than other precontemplators. A greater percentage of self-relevant thinkers than non-self-relevant thinkers reported both permitting touching under the clothing (10% compared to less than 1%) and touching someone else under clothing (13% compared to 1%). Both differences were statistically significant (Fishers' exact of .013 and .006, respectively). None of the precontemplators had engaged in consensual exposure or touching of private parts. While very few precontemplators overall progressed in stage of sexual readiness from time 1 to time 2, a greater percentage of self-relevant thinkers progressed (13%) than did non-self-relevant thinkers (5%), a trend that approached statistical significance (Fisher's exact = .10).

DISCUSSION

This is one of the first prospective studies to explore the development of sexual intentions and behaviors in young adolescents. We set out to assess the range of sexual intentions and behaviors among African American pre-teens within the context of the stages of change construct. Over 99% of pre-teens were successfully categorized into one of four stages of sexual readiness consistent with Prochaska's theory (Prochaska et al., 1992). Not surprisingly in a sample with a mean age of 10, the majority of participants in this study were in precontemplation at baseline. Only one pre-teen was in action, and 10% of participants were in contemplation or preparation, indicating that they anticipated initiating sex within the next year. Half of these participants had initiated consensual touching under clothing or touching or showing of private parts, placing them in the preparation stage of initiation. Consistent with prior

Table 2. Stage at Baseline by Stage at Six Months

Stage at Baseline		Stage at Six Months				
		Precontemplation	Contemplation	Preparation	Action	Total
Precontemplation	Count	178	7	3	2	190
	% w/i Stage at Baseline	93.7%	3.7%	1.6%	1.1%	100.0%
Contemplation	Count	6	1	2	1	10
	% w/i Stage at Baseline	60.0%	10.0%	20.0%	10.0%	100.0%
Preparation	Count	4	1	3	1	9
	% w/i Stage at Baseline	44.4%	11.1%	33.3%	20.0%	100.0%
Action	Count	0	0	0	1	1
	% w/i Stage at Baseline	0.0%	0.0%	0.0%	100.0%	100.0%
Total	Count	188	9	8	5	210
	% of total sample	89.5%	4.3%	3.8%	2.4%	100.0%

Note. w/i = within.

Table 3. Stage at Baseline by Stage at Six Months, by Gender

Gender	Stage at Baseline	Stage at Six Months					Total
		Pre-contemplation	Contemplation	Preparation	Action	Total	
Males	Pre-Contemplation	Count	75	4	3	2	84
		% w/i Stage at Baseline	89.3%	4.8%	3.6%	2.4%	100.0%
	Contemplation	Count	4	1	0	1	6
		% w/i Stage at Baseline	66.7%	16.7%	0.0%	16.7%	100.0%
	Preparation	Count	1	1	2	1	5
		% w/i Stage at Baseline	20.0%	20.0%	40.0%	20.0%	100.0%
	Action	Count	0	0	0	1	1
		% w/i Stage at Baseline	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	Count	80	6	5	5	96
		% of total sample	83.3%	6.3%	5.2%	5.2%	100.0%
Females	Pre-Contemplation	Count	103	3	0	0	106
		% w/i Stage at Baseline	97.2%	2.8%	0.0%	0.0%	100.0%
	Contemplation	Count	2	0	2	0	4
		% w/i Stage at Baseline	50.0%	0.0%	50.0%	0.0%	100.0%
	Preparation	Count	3	0	1	0	4
		% w/i Stage at Baseline	75%	0.0%	25.0%	0.0%	100.0%
	Action	Count	0	0	0	0	0
		% w/i Stage at Baseline	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	Count	80	6	5	5	114
		% of total sample	83.3%	6.3%	5.2%	5.2%	100.0%

Note. w/i = within.

research (Kotchick et al., 2001), the pattern of stage distribution suggests progression in sexual readiness with each year of age, with 15% fewer adolescents in precontemplation at age 11 than at age 9.

Our second aim was to describe patterns of progression through stages of sexual readiness during a 6-month period. Overall, there was substantial stability in stage of readiness from time 1 to time 2. However, the likelihood of movement did vary significantly by age, with increased movement from age 9 to age 10 and from age 10 to age 11. Due to the limited amount of movement over 6 months, it is not yet possible to draw definitive conclusions regarding patterns of movement; however, several trends appear to be emerging and should be explored further in subsequent research.

First, 6-month stability seems to be greatest for those in precontemplation, suggesting that movement may occur more rapidly from more advanced stages of sexual readiness. Second, there is evidence of both regression and progression in stages prior to action, indicating that, similar to the patterns of movement documented when individuals are attempting to modify addictive behaviors (Prochaska et al., 1992), adolescents may engage in a cyclical pattern of movement when initiating sexual intercourse. Third, the dynamics of movement may differ by age and gender, as movement from precontemplation appears to begin at age 10 for boys, while girls tend to remain in this stage through at least age 11. Should these patterns hold in additional studies with greater statistical power, there will be important implications for tailoring prevention programs designed to promote stability or stage regression.

Finally, there appears to be a subgroup of pre-teens within the precontemplation group that has cognitively pro-

gressed toward sexual initiation in a manner that cannot be captured by the stage of change construct, as it is currently defined. Beginning to think about sex in a self-relevant way may be an important factor in the formation of behavioral intent (i.e., progression from precontemplation to more advanced stages). Among precontemplators in this sample, self-relevant thinkers were significantly more likely to report having engaged in advance pre-coital behaviors at time 1. Further, there was a trend toward increased likelihood of stage progression at time 2, although the number of participants progressing was small.

Additional research should determine if the stages will require modification or refinement in order to predict and explain the process of sexual initiation. While only speculation at this point, if the cyclical patterns hold, the precontemplation group could conceivably contain a range of distinct subgroups, including individuals who have truly never conceptualized the behavior, individuals who have begun the process of forming intent (the self-relevant

Table 4. Percent Distribution of Patterns of Movement by Age

Age (years)	Patterns of Movement				Total	
	Regressed	Stable	Progressed	%	<i>n</i>	
9	1.9	96.2	1.9	100.0	53	
10	4.1	88.8	7.1	100.0	98	
11	9.6	76.9	13.5	100.0	53	
12	*	*	*	100.0	7	
Total (N)	5.2	87.1	7.6	100.0	210	

* Numbers too small for meaningful percentage estimates.

thinkers in this study), and individuals who have regressed in stage of sexual readiness.

Several potential limitations of the study should be noted. First, the study used a convenience sample of children whose parent/guardian self-selected to respond to recruitment efforts. Participants were also required to have resided with their parent/guardian for at least three consecutive years. Therefore, these findings may not be generalizable to other populations of African American youth. Homeless, incarcerated, or other adolescents from less stable environments may have different patterns of sexual attitudes, intentions, and behavior.

Further, this sample included primarily African American youth, all of whom lived in areas of the Southeast with high rates of HIV and other STDs. Findings may therefore not be generalizable to other racial/ethnic groups or to other geographic areas. Data suggest that patterns of sexual initiation may vary by race (Smith & Udry, 1985), and given potential variation in cultural and media influences, geographic differences may also exist.

Because the survey was not originally designed to assess stages of change, some questions do not conform precisely to the construct. Reported likelihood of initiation was used as an indicator of intention, but participants' expectations may have been influenced by peer norms and peer pressure, in addition to actual plans to initiate. However, self-reported likelihood of initiation was significantly related to participants' degree of agreement with the statement, "I think I am ready to have sex" (Fisher's exact $p < .0004$). This suggests that reported likelihood is related to desire to initiate.

Additionally, all measures were based on self-report and were subject to several forms of reporting bias, including the tendency to underreport risky behaviors (Turner et al., 1998). Several study procedures may have limited this bias, including the use of computer-assisted interviews, the separation of children from their parent/guardian while completing the assessment, and assurances of confidentiality. Analysis also confirmed a high degree of consistency in participant reporting from time 1 to time 2, increasing our confidence in the measures. It is unlikely that participants could remember and replicate patterns of misreporting over at 6-month period. Where responses were inconsistent, analysis confirmed that inconsistencies did not represent a major problem in terms of study conclusions, as stage of change was not impacted for the vast majority of participants.

For 7 participants (3% of the overall sample), 6 of whom regressed in stage of sexual readiness, inconsistencies in response patterns may have resulted in staging errors (Butler et al., under review). Because it is not possible to distinguish actual regression from misunderstanding of, or misreporting on, stage indicators, patterns of regression should be interpreted with caution. However, even if these cases were excluded, there would be evidence of regression in stage at 6 months and non-linear stage movement. Methods to ensure that comparable information is

collected at all assessments and qualitative data on interpretation of sexual questions may significantly improve the reliability of the measure in future research (Butler et al., under review). Finally, while the overall sample size was relatively large, there was very little progression during the 6-month interval examined. Findings regarding patterns of progression in this study should therefore be considered preliminary and validated in future research.

This research could improve our understanding of whether the stages and processes of change, as defined for cessation, can be applied or modified to predict and explain the adoption of behavior and help shift our focus to primary, rather than secondary, prevention. In terms of adolescent health, these data confirm earlier research by Miller et al. (1997) among older adolescents and indicate that there are distinguishable patterns of sexual readiness, even among young adolescents. Pre-teens who have not yet initiated sexual intercourse vary in frequency of sexual thoughts, experimentation with pre-coital behaviors, and intention to initiate. Because at least two studies have demonstrated the link between intention and subsequent sexual behavior in adolescents (Kinsman et al., 1998; Stanton et al., 1996), these findings suggest that for many adolescents, intervention must occur between ages 9 and 11 to interrupt progression from intention to behavior, and perhaps even earlier to delay formation of intention. Sixteen percent of precontemplators at time 1 reported having thought about sex in a self-relevant way.

Future research should study whether self-relevant thought is predictive of the formation of intention and whether stage of sexual readiness, which combines intention with preparatory behavioral attempts, is more predictive of sexual initiation than intention alone. Although it is only the first step in the chain of research that would be required, this study provides the initial framework for the application of the TTM to sexual initiation. If stages of sexual readiness are found to be predictive of sexual initiation in this and other high-risk populations, research on correlates of sexual behavior could be expanded within this framework to understand the processes of change. The ultimate goal would be to develop a model that is predictive of various pathways to sexual initiation and that distinguishes between the establishment of either healthy or risky lifetime sexual behaviors. Public health efforts could then be directed more effectively to help each generation of adolescents establish healthy patterns of sexual behavior as they come of age.

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