

Original article

Long-Term Effects of the Strong African American Families Program on Youths' Conduct Problems

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Abstract

Purpose: The Strong African American Families program, a universal intervention to deter alcohol use among rural African American preadolescents, was evaluated to determine whether it also prevented conduct problems across the 29 months separating the pretest and long-term follow-up assessments. The program is based on a contextual model in which intervention effects on parental behavior and youth protective factors are hypothesized to lead to behavior changes.

Methods: African American 11-year-olds ($N = 667$) and their primary caregivers were randomly selected from public school lists of fifth-grade students and randomly assigned to an intervention ($n = 369$) or control ($n = 298$) condition. Intervention families participated in a 7-week family skills training program designed to deter alcohol use. Each meeting included separate, concurrent sessions for parents and children, followed by a joint parent–child session during which the families practiced the skills they learned in their separate sessions. Control families were mailed leaflets regarding early adolescent development, stress management, and exercise. All families completed in-home pretest, posttest, and long-term follow-up interviews during which parent-report and self-report data regarding conduct problems, low self-control, deviance-prone peer affiliations, parenting, and youth protective processes were gathered.

Results: Intent-to-treat analyses indicated that prevention-group youth were less involved than control-group youth in conduct problems across time. As hypothesized, prevention effects were stronger for youth at greater risk of developing conduct problems. Intervention targeted parenting and youth factors partially accounted for intervention effects among high risk youth.

Conclusions: Although the Strong African American Families program was designed to deter underage drinking, it is also effective in preventing the development of conduct problems. © 2008 Society for Adolescent Medicine. All rights reserved.

Keywords: African Americans; Child behavior; Intervention studies; Parenting; Primary prevention; Risk reduction behavior; Rural health; Social behavior

Early adolescence is a crucial developmental window for preventing the onset and escalation of conduct problems and substance use. Substance use increases rapidly during early adolescence [1], and rates of conduct prob-

lems such as delinquent and disruptive behavior almost double between ages 9 and 15 [2]. Onset of these behaviors in early adolescence has prognostic significance for school failure, criminal justice system involvement, and drug abuse [3,4].

Recently, rural adolescents' levels of many of these problems have equaled those of urban youth [5]. The Strong African American Families program (SAAF) [6] was designed to prevent alcohol-use onset among the several million African

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American youth living in the rural South. Rural African American youth face considerable risk for alcohol use and conduct problems because of pervasive poverty, lack of mental health resources, and a historical mistrust of service systems that focus on mental health and substance use [5]. Before SAAF was developed, no culturally appropriate programs existed for these youth. Results from a cluster-randomized prevention trial indicated that SAAF prevented both the onset and escalation of alcohol use 24 months after the intervention concluded [7]. Alcohol use prevention effects were linked to changes in intervention-targeted parenting and youth protective factors derived from our previous longitudinal research [6,7].

The present research extends these findings by examining three hypotheses that can inform the general design of prevention programs and extend SAAF's public health impact. First, we hypothesize that, because of the influence of common etiological factors, an alcohol use preventive intervention also may prevent the onset and escalation of conduct problems. Second, we hypothesize that youth at higher risk of developing conduct problems will benefit more from SAAF participation than those at low risk. Finally, we examine the mediating processes that inform SAAF effects on conduct problems among higher risk youth. The significance and theoretical background for each hypothesis are described below.

Common Risk and Protective Factors, Multiple Outcomes, and Adolescent Prevention Programming

Problem Behavior Theory [8] posits that different adolescent behavior problems represent a single syndrome with common causes. This suggests that generalized interventions targeting these causes may be effective for distinct negative outcomes. Studies confirm that many negative youth outcomes (e.g., alcohol use, conduct problems, sexual behavior) are highly correlated and share common risk factors [8,9]. As much as two-thirds of the variability in these studies, however, is the result of unique rather than common causes [9]. Little experimental research has addressed this question despite intervention trials' potential to determine the extent to which changing common factors can influence multiple negative outcomes.

SAAF addresses protective factors that forecast both alcohol use and conduct problems: consistent discipline, affectively positive parent–child relationships, and racial socialization [10–12]. Racial socialization involves parents' discussing with children pride in their ethnicity and management of discrimination, a deterrent to conduct problems and substance abuse [13]. SAAF also addresses parent–child communication about drugs, alcohol, and sex.

Youth protective processes targeted in SAAF included academic competence, self-esteem, future orientation, and negative attitudes about substance use and early-onset sexual activity. Difficulties with self-regulation [14], low academic competence and self-esteem, and a lack of future

goals have been linked with the onset of substance and conduct problems [15]. Taken together, these processes reduce the influence of deviant peer affiliations and the likelihood that, in peer-oriented social situations, youth would engage in impulsive actions that lead to alcohol use [16]. Accordingly, we hypothesize that SAAF participation will deter both alcohol use and the development of conduct problems.

The Differential Influence of Universal Preventive Interventions on High- and Low-Risk Youth

SAAF was designed as a universal intervention that does not exclude any rural African American families from participation. Universal interventions are implemented with heterogeneous samples of youth at varying levels of risk for problems. Questions regarding such interventions' impact involve their suitability for high-risk youth [17]. Evidence suggesting that high- versus low-risk youth may benefit more from universal preventive interventions [17,18] is consistent with Rutter's [19] observation that the influence of protective processes is strongest under conditions of highest risk. Thus, we predicted that SAAF's effects would be stronger for youth at higher risk for conduct problems than for those at lower risk. We used two reliable indicators that forecast conduct problems: low self-control and affiliation with deviance-prone peers.

Self-control includes the ability to set and attain goals, to plan actions and consider their consequences, and to persist [20]. Difficulty in regulating behavior forecasts both the onset and the escalation of conduct problems [21]. Self-control is associated with protective factors targeted in SAAF, including academic competence, and risk factors, such as deviance-promoting attitudes [8]. Peer affiliations serve as proximal links to conduct problems and disengagement from conventional activities such as school attendance and academic achievement [22]. Affiliation with deviance-prone peers forecasts the onset and escalation of conduct problems among both African American and majority group adolescents [23,24]. Despite the importance ascribed to affiliations with deviance-prone peers as a precursor to conduct problems, prevention researchers have not examined the possibility that youth whose circle of acquaintances model conduct problems benefit more from prevention programming. This study addressed that issue.

Mediating Process for High-Risk Youth in SAAF

Following the expectation that high-risk youth would demonstrate robust intervention effects and that low-risk youths' changes would be minimal, we examined the mediating processes that accounted for changes among high-risk youth. We expected SAAF's effects on conduct problems to be mediated through its effects (a) on parenting practices for youth with deviance-prone peers and (b) on youth protective processes for those low in self-control.

Support for the first hypothesis is based on analyses linking affiliation with deviance-prone peers with harsh parenting, low levels of monitoring, lax discipline, and low nurturance [15,25]. Thus, bolstering protective parenting for youth who affiliate with deviance-prone peers was expected to account for SAAF's effects on conduct problems for this subgroup. Prior analyses of SAAF's efficacy [6,7] support the second hypothesis. Increases in youth protective processes that enhance development of self-regulation mediated the effect of group assignment on long-term outcomes. Thus, this led the expected program's enhancement of intrapersonal attitudes and self-regulatory skills to be responsible for intervention effects among this subgroup.

Methods

Participants

Participants were 667 African American primary caregivers and their 11-year-old children (mean = 11.2 years of age), in nine rural Georgia counties. Youth identified from public school lists of fifth-grade students were contacted by community liaisons, African American community members living in the same counties as the participants and selected for our project on the basis of their social contacts and standing in the community. Liaisons sent letters to the families and made follow-up phone calls to the primary caregivers explaining the project and answering questions [26]. Of the eligible families contacted, 64% agreed to participate. Families receiving the intervention were oversampled; 369 families were assigned to SAAF and 298 to the control condition.

Participating families had an average of 2.7 children. In 52.7% of these families, the target youth was a girl. Of the caregivers, 54.0% were single, 36.2% were married and living with their spouses, 2.2% were married but separated from their spouses, and 7.1% were living with partners to whom they were not married. Mothers' mean age was 37.7 years; fathers' was 39.8 years. Most parents, 80.0%, had completed high school. Median family income was \$1740.74 per month.

Randomization

To avoid contamination of the intervention in close-knit communities and possible alienation of community members who would not receive the intervention [26], randomization occurred at the county level. Of the nine counties from which families were recruited, two were small, contiguous, and similar in per capita income and African American population. These counties were combined into a single population unit, yielding a total of eight units that were randomly assigned to either the control or the intervention condition, with four units in each condition.

Procedures

Families were assessed at pretest, posttest (8 months), and long-term follow-up (29 months); 91% completed all assessments. No significant experimental condition \times attrition interaction effects emerged.

Participating parents received \$75, and youth received \$25, after each assessment. Data were collected in participants' homes by trained African American field researchers. Self-report questionnaires were administered to caregivers and youth in private interviews using computer-assisted procedures that eliminated literacy concerns. Informed consent/assent was obtained at all data collection points.

Intervention implementation, attendance, and fidelity

SAAF consists of seven weekly meetings held at community facilities. Each meeting includes separate, concurrent training sessions for parents and youth, followed by a joint parent–youth session during which families practice skills they learned in their separate sessions. Each session lasts 1 hour. SAAF families were invited to attend a booster session 6 months after the program ended. Control families were mailed three leaflets describing early adolescent development, stress management, and adolescent fitness.

SAAF parents were taught to use nurturant-involved parenting along with high levels of monitoring and control, adaptive racial socialization strategies, strategies for communication about sex and substance use, and the establishment of clear expectations about substance use. Youth learned adaptive behaviors to use when encountering racism, ways to form goals for the future and make plans to attain them, similarities and differences between themselves and agemates who use alcohol, and peer pressure resistance strategies. Together, family members practiced communication skills and engaged in activities to increase family cohesion and youths' positive involvement in their families.

Ten three-person teams of African American leaders, who received 40 hours of training, conducted 38 groups that ranged from 3 to 12 families (mean = 10). Mean attendance was 4.7 sessions. All sessions were videotaped to assess fidelity to the program. For each group, two parent, two youth, and two family sessions were selected randomly and scored for adherence. Interrater reliability was computed for 23% of the adherence assessments (intraclass correlation > .80). Mean adherence to intervention components was 90%.

Measures

Conduct problems. Youth answered five questions from the National Youth Survey [27] concerning the frequency with which, during the past year, they engaged in disruptive behaviors involving theft, truancy, and suspension from school. Elliott et al [27] illustrated the scoring of this instrument; the number of conduct problems that a youth endorses constitutes the conduct problems score. Because of the presence of low base-rate behaviors, internal consis-

tency analyses are not typically computed for this type of measure [27].

Affiliation with deviance-prone peers. Using 14 items from the National Youth Survey [27], youth reported, on a scale ranging from 0 (none of them) to 2 (all of them), the proportions of their friends who engage in behaviors such as substance use, truancy, and theft (pretest $\alpha = .82$).

Low self-control. On a scale ranging from 0 (never) to 4 (almost always), caregivers rated youths' distractibility, carelessness, and need for supervision using the Lack of Self-Control subscale from Humphrey's Self-Control Inventory [28] (pretest $\alpha = .60$).

Mediational processes. SAAF was designed to affect behavioral outcomes via curricula targeted toward specific parenting processes and youth intrapersonal protective processes. We assessed change in these mediating processes using protective factor indices [29] to assess the change in parent and youth protective factors. This method is consistent with findings that treatment outcomes are mediated by any of a number of intervention-targeted factors that vary among individuals rather than by the presence or absence of one specific factor [30]. Consistent with previous applications of this strategy [29], indices were formed at pretest and posttest by assigning a "1" to the upper quartile of the sample and a "0" to the lower three quartiles on scales assessing each targeted variable. Dichotomized scores were then added together.

Intervention-targeted parenting scales. Parents completed scales that addressed four intervention targets: communication about drugs, alcohol, and sex; consistent child management practices; positive affect in the parent–child relationship; and racial socialization. Frequency of communication regarding parents' expectations concerning alcohol and drugs was assessed with a two-item scale developed for this project (pretest $r = .35$, $p < .01$; posttest $r = .30$, $p < .01$). Frequency of communication about sexuality was assessed with an eight-item scale [31] (pretest $\alpha = .82$; posttest $\alpha = .87$). Consistent use of intervention-targeted child management techniques were assessed using a 25-item scale developed for this trial (pretest $\alpha = .69$; posttest $\alpha = .72$). Relationship-building behaviors were assessed with a similar 17-item scale (pretest $\alpha = .72$; posttest $\alpha = .73$). The 15-item Racial Socialization Scale [32] indexed parents' involvement in teaching youth to be proud of being African American and how to deal with discrimination (pretest $\alpha = .86$; posttest $\alpha = .88$).

Intervention-targeted youth protective factors. Four scales addressed SAAF-targeted youth protective factors. Parents reported youths' engagement and competence in academic activities using an instrument developed by Harter [33] (pretest $\alpha = .85$; posttest $\alpha = .83$). Youth self-reported their self-esteem on the Rosenberg Self-Esteem Measure [34]

(pretest $\alpha = .77$; posttest $\alpha = .73$). We developed a five-item scale to measure youths' ability to set, sustain, and achieve goals for the future (pretest $\alpha = .72$; posttest $\alpha = .64$). A four-item scale that Jessor and Jessor [8] developed was used to assess youths' negative attitudes toward drinking and sexual activity (pretest $\alpha = .79$; posttest $\alpha = .78$).

Results

Preliminary analyses

Sample equivalence. Experimental group comparisons on family characteristics and the study variables indicated that mother's education, mother's age, and number of children in the household were equivalent. Chi-square tests also revealed no pretest differences for target gender, $\chi^2(1, N = 482) = .84$, $p = .36$, or single- versus dual-parent household structure, $\chi^2(1, N = 482) = .74$, $p = .39$. Pretest differences emerged, however, for per capita income, conduct problems, and youth protective processes. Families in counties in which the intervention was offered reported significantly less income. To address these departures from equivalence, a propensity score approach was utilized. A propensity score, defined as the conditional probability of being treated given the covariates, can be used to balance the covariates in the two groups, thereby reducing this bias [35]. Predictors of condition assignment plus key demographic variables were used to model the distribution of the treatment indicator variable [35]. The propensity score for each case is used to create equivalent groups. In this case we used Greedy matching techniques [36]. This technique makes "best" matches first and "next-best" matches next, in a hierarchical sequence until no more matches can be made. Best matches are those with the highest digit match on the propensity score. The algorithm proceeds sequentially to the lowest digit match on the propensity score. This process resulted in a sample ($N = 241$, intervention; $N = 241$, control) matched on the propensity score.

Table 1 presents experimental group comparisons of family characteristics and the study variables using the propensity sample. Mother's education, mother's age, per capita income, and number of children in the household were equivalent. Chi-square tests revealed no pretest differences for target gender, $\chi^2(1, N = 482) = .84$, $p = .36$, or single- versus dual-parent household structure, $\chi^2(1, N = 482) = .74$, $p = .39$. Pretest differences remained for conduct problems and youth protective processes, which were controlled in subsequent analyses.

County-level effects

Because randomization occurred at the county level, we examined potential county-level effects using Hierarchical Linear Modeling to determine if data analyzed at the individual level would result in unbiased estimates. Tests of county effects on conduct problems, parenting factors, and

Table 1
Pretest equivalence of experimental condition on family background characteristics and study variables

Variables	Experimental condition				T
	Prevention (n = 241)		Control (n = 241)		
	Mean	SD	Mean	SD	
Demographic variables					
Per capita income, month, \$	512.68	354.25	513.60	377.74	-0.27
Mother's education ^a	4.64	1.34	4.52	1.35	0.99
Mother's age, year	37.41	7.83	37.33	7.54	-0.11
Number of children in household	2.68	1.43	2.74	1.38	-0.49
Intervention-targeted parenting, pretest	2.00	1.50	2.17	1.56	1.22
Youth risk factors, pretest					
Low self-control	5.51	2.45	5.66	2.59	-0.65
Affiliation with deviance-prone peers	4.78	4.14	4.39	4.48	1.00
Youth protective processes, pretest	1.74	1.14	1.95	1.15	2.03*
Youth problem behaviors, pretest	0.44	1.05	1.06	3.75	2.14*

^a 1 = grades 1 to 4, 2 = grades 5 to 8, 3 = grades 9 to 12 (no diploma), 4 = high school graduate or GED, 5 = some college or trade school (no degree), 6 = trade school diploma/certificate or associate's degree, 7 = bachelor's degree, 8 = some graduate school, 9 = master's degree, 10 = doctorate or professional degree.

* *p* < .05.

youth protective factors revealed no significant effects based on county membership. Accordingly, the study hypotheses were analyzed at the individual level.

Test of the study hypotheses

Negative binomial regression was used to test the study hypotheses. This procedure, appropriate for positively skewed count data, was selected because it corrects for the overdispersion that occurs when the variance is greater than the mean [37]. Model 1 in Table 2 depicts the test of hypothesis

Table 2
Negative binomial regression analyses of intervention effects, risk status, and risk status × intervention interactions on conduct problems

Variables	Model 1			Model 2			Model 3		
	No moderator			Low self-control			Deviance-prone peers		
	b	SE	OR	b	SE	OR	b	SE	OR
Pretest	.14**	.60	1.15	.07	.04	1.07	.09**	.04	1.10
Moderator				.24**	.05	1.27	.13**	.03	1.13
Intervention	-.78**	.21	.46	-.52*	.20	.59	-.59**	.20	.55
Intervention × moderator				-.15*	.08	.86	-.10**	.05	.90

OR = odds ratio.

* *p* < .05.

** *p* < .025.

Table 3
Mean changes in conduct problems from pretest to long-term follow-up for the SAAF and control groups

Treatment group	Self-control		Affiliations with deviant peers	
	Above median	Below median	Above median	Below median
SAAF condition	.62	.60	.85	.33
Control condition	1.73	.91	1.71	.62

1, that youth in the SAAF condition would evince fewer conduct problems than those in the control condition across the 29 months from pretest to long-term follow-up. SAAF evinced a significant intervention effect on conduct problems, controlling for pretest levels; it reduced youths' chances of engaging in conduct problems by 54% relative to the control group.

Models 2 and 3 in Table 2 present tests of hypothesis 2, that low self-control and affiliation with deviance-prone peers would moderate intervention effects on long-term changes in conduct problems. Inclusion of the interaction term in the final step of each analysis was significant. To describe these effects, we divided the samples of youth in the SAAF and control groups at the median on each moderator and calculated the mean change in conduct problems by each group × moderator combination (see Table 3). The pattern of the mean change in conduct problems indicates that long-term changes in conduct problems as a function of SAAF participation were greater for youth with low levels of self-control and numerous affiliations with deviance-prone peers.

Mediational results

Because the moderational analyses indicated negligible change in conduct problems for youth with high self-control or few deviance-prone peers, mediational analyses focused on the subsets of youth demonstrating intervention effects. Mediational hypotheses require establishment of (a) significant intervention effects on the outcome, (b) significant intervention effects on the hypothesized mediators, (c) sig-

Table 4
Tests of mediational hypotheses

	β	SE	OR	p	Model fit
High deviance-prone peers subgroup (n = 190)					
Step 1					
Intercept	.830	.204	—	.00	$\chi^2_{(2)} = 16.46, p = .00$
Conduct problems (pretest)	.092	.070	1.10	.19	
Assignment to SAAF	-.968	.269	.38	.00	
Step 2					
Intercept	.760	.198	—	.00	$\chi^2_{(3)} = 19.09, p = .00$
Conduct problems (pretest)	.078	.062	1.08	.21	
Assignment to SAAF	-.726	.280	.48	.01	
Protective Parenting Index	-.180	.087	.84	.00	
Low self-control subgroup (n = 120)					
Step 1					
Intercept	1.13	.043	—	.00	$\chi^2_{(2)} = 22.96, p = .00$
Conduct problems (pretest)	.050	.043	1.05	.24	
Assignment to SAAF	-1.35	.307	.26	.00	
Step 2					
Intercept	.996	.221	—	.00	$\chi^2_{(3)} = 25.00, p = .00$
Conduct problems (pretest)	.058	.045	1.06	.20	
Assignment to SAAF	-1.17	.317	.311	.00	
Youth Protective Index	-.214	.116	.808	.06	

nificant mediator effects on the outcome, and (d) the attenuation of the intervention effect on the outcome in the presence of the mediators [38]. For each subsample tested, the intervention effect was confirmed (step a). Among youth who had more affiliations with deviance-prone peers, SAAF reduced the chances of engaging in conduct problems by 62% ($p < .01$). Among youth with low self-control, SAAF reduced the chances of engaging in conduct problems by 74% ($p = .001$). SAAF also had a significant effect on the mediators (step b; not pictured in Table 4). SAAF was associated with increases in the protective parenting index ($\beta = .12, p = .03$) and the youth protective factor index ($\beta = .23, p = .00$). Per mediation step c, we examined the mediators' effects on the outcome variable. The respective protective factor indices were both associated with conduct problems at follow-up (high deviant peer group: $p < .01$; low self-control group: $p = .06$). Finally, intervention effects on the outcomes were attenuated in the presence of the mediating index (step d; see Table 4), indicating partial mediation [38]. A Freedman-Schatzkin analysis [39] indicated that the mediating effect was significant; $p < .00$ for the high deviant peer group and $p < .03$ for the low self-control group.

Discussion

This research with a sample of rural African American adolescents examined the influence of SAAF participation on conduct problems. Compared with adolescents in the control condition, fewer intervention-group youth increased their involvement in conduct problems over time. The study's randomized design and its results extend findings from previous studies in which, compared with control group youth, fewer SAAF participants initiated alcohol use

and those who did use alcohol increased their use at a slower rate over time. The results bolster SAAF's contribution as a public health, primary prevention approach to the reduction of conduct problems in the population for which it was designed. This is particularly important because SAAF is the only family-centered prevention program designed specifically for rural African American youth that has been demonstrated to be efficacious.

The potential public health impact of SAAF is further bolstered by its cost-effectiveness. SAAF is considerably less cost-intensive than parent training programs. Participants in group-based parent training programs designed to reduce youth conduct problems can average hundreds of hours in intervention meetings [40], whereas SAAF families received 14 hours of training. Although we have yet to undertake cost-effectiveness analyses of SAAF, we expect it to be less expensive than programs that take far more of the leaders' and participants' time.

SAAF's efficacy can be attributed to the research base and community partnerships that guided its development. Our research program enabled us to identify malleable youth protective factors, such as involved-vigilant parenting and a goal-related future orientation, to serve as proximal targets for intervention. These data helped to ensure that SAAF would be culturally and ecologically appropriate for rural African American youth. The community partnerships informed SAAF's curriculum and sample retention strategies. Focus groups of rural African American caregivers and youth provided feedback about the SAAF curriculum's sociocultural relevance, and the community liaison network, which included rural African American adults living in the same communities as the participants, enabled us to achieve high retention rates. The community liaisons tracked re-

search participants who moved or were for any reason difficult to reach. Such community partnership processes are important for achieving high rates of engagement with a successful curriculum.

We also tested hypotheses about moderation of prevention effects on youths' development of conduct problems. These hypotheses were confirmed: SAAF's impact on conduct problems was most pronounced for youth who, at pretest, were more vulnerable to the development of such problems because of low self-control or affiliation with deviance-prone peers. This hypothesis was based on Rutter's observation [19] that the influence of protective processes is strongest under conditions of highest risk. These findings add to the growing evidence that those at highest risk prior to participation benefit most from preventive interventions [18]. It is also noteworthy that youth protective processes served as a partial mediator of SAAF effects on conduct problems for youth with lower self-control at baseline and intervention-targeted parenting partially mediated SAAF effects for youth who associated with more deviance-prone peers. These findings illustrate the moderated mediation hypotheses that SAAF's efficacy in reducing conduct problems over time is particularly pronounced for high-risk subgroups, and that within these subgroups specific intervention-targeted processes are partially responsible for intervention effects. Future research is needed to determine whether other processes completely mediate SAAF's effects on problem behavior.

Several limitations to the present research should be noted. First, male caregivers rarely participated in the program even though they were invited to do so. SAAF's efficacy may be improved by including male caregivers in the intervention. Second, it is not known to what extent support and attention provided by the intervention affected prevention effects. Although rare in the prevention field, future studies using attention-control designs can disentangle this potential confound. Finally, although this longitudinal investigation covered 29 months, continuing to track the effects that occur beyond that time is essential. We do not know whether participation in SAAF will continue to prevent conduct problems through the youths' high school years. Nevertheless, the present results support the public health impact of a preventive intervention that deters alcohol use and conduct problems among an underserved population with few resources available to them.

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