Persistence of Effects of the Checkpoints Program on Parental Restrictions of Teen Driving Privileges

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Objectives. We describe intervention effects on parent limits on novice teenage driving.

Methods. We recruited parents and their 16-year-old children (n = 469) with learner's permits and randomized them from August 2000 to March 2003. Intervention families received persuasive newsletters related to high-risk teenage driving and a parent–teenager driving agreement; comparison families received standard information on driver safety. We conducted interviews when the adolescents obtained a learner's permit, upon licensure, and at 3, 6, and 12 months postlicensure.

Results. Intervention parents and teenagers reported stricter limits on teen driving compared with the comparison group at 12 months, with direct effects through 3 months and indirect effects through 12 months postlicensure.

Conclusions. A simple behavioral intervention was efficacious in increasing parental restriction of high-risk teen driving conditions among newly licensed drivers. (*Am J Public Health.* 2005;95:447–452. doi: 10.2105/AJPH.2003.023127)

Motor vehicle crash rates for teenagers are higher than for older drivers,[1,2] particularly during the first 6 months and for 1000 to 3000 miles after licensure.[3] Because driving proficiency and judgment develop only gradually with experience,[4] young age and inexperience with driving are inextricably associated with motor vehicle crash rates.[4–8] Late-night driving[9–11] and transporting teenaged passengers[12,13] elevate crash risks.

Graduated driver licensing (GDL) policies delay licensure and temporarily restrict high-risk driving conditions. GDL is a recent policy innovation that has been shown to reduce statewide crash rates among teenagers[14,15] and is now the primary policy approach to reducing the rates of crashes in which young drivers are at the wheel.[9] Although 35 states and the District of Columbia currently have 3-stage GDL, actual policies vary greatly from state to state, and few approach the proposed ideal.[16] In addition, GDL is a largely passive program, and little is known about the extent to which young drivers comply with GDL restrictions.[17]

With or without GDL, parents remain the true enforcers of driving privileges among teenagers, because parents can control access to the car.[18–20] Many parents impose modest restrictions on their teenaged children when they become licensed,[21] and such parental restrictions have been found to be negatively associated with risky driving among young drivers.[21,22] In general, parents allow their teenagers greater driving privileges than are consistent with safety.[23] However, well-designed and persuasive communications directed at salient issues and focused on specific and acceptable courses of action can alter perceptions, attitudes, and behavior.[24,25] Previously, Simons-Morton et al.[26] provided evidence of short-term effects of parental restrictions on adolescent driving among families exposed to the Checkpoints Program. We describe the persistence of treatment group effects through 12 months postlicensure on parental restriction of driving privileges among teenaged drivers in Connecticut, a state without a formal GDL system.

METHODS

Participants

In Connecticut, teenagers as young as 16 years of age can obtain permits. Upon completion of driver's education courses, teenaged drivers can obtain licenses 4 months after permit receipt; if driver education courses are not completed, licenses can be received 6 months after permit receipt. A total of 537 eligible families were approached for recruitment at 8 offices of the Connecticut Department of Motor Vehicles, and 469 parent–teenager dyads (87%) agreed to participate in the program, of whom 420 (90%) completed prelicense surveys and were randomized to the intervention group (n=210) or the comparison group (n=210) for the period August 2000–March 2003.

Parental characteristics consisted of the following: 61% were mothers and 37% were fathers; 83% were White, 2% were Asian, 6% were Hispanic, and 7% were Black; 67% were 40 to 49 years old; 80% were married and 13% were divorced; 80% were full-time workers; 75% had some education after high school; and 61% had annual household incomes greater than $50 000. Adolescents were 53% male and 47% female, and 362 (184 in the intervention group and 178 in the control group) of 420 obtained driver's licenses within 12 months of eligibility, with a median time to licensure of 7 months.

Of dyads completing prelicense surveys, 350 teenagers obtained licenses within 12 months and were included in follow-up assessments. The numbers of parent–teenager dyads with completed interviews were as follows: at licensure, 304 (intervention, 145; comparison, 159); at 3 months, 260 (intervention, 124; comparison, 136); at 6 months, 280 (teenagers only: intervention, 130; comparison, 150); and at 12 months, 253 (intervention, 114; comparison, 139). At licensure no differences were seen between groups on demographic variables, age at licensure, and time to licensure. Loss to follow-up was greater among dyads in the intervention group, among dyads from minority families, among dyads with unmarried parents, among parents with lower levels of education, and among teenagers licensed at older ages.

Procedures

Study participants were recruited at the 8 (of 14) offices of the Connecticut Department of Motor Vehicles that had the largest number of customers. Teenagers who had successfully acquired a learner's permit were recruited with a parent and randomized to the intervention group or the comparison group after completion of prelicense interviews. Over a 12-month period, intervention families received (by mail) a video, a series of newsletters, and a driving agreement. Comparison families were mailed information about driver safety (e.g., airbags, seat belts) in such a way as to ensure both groups received the same number of newsletters of similar design and quality at approximately the same time. Parents and teenagers completed 25-minute telephone interviews about adolescent driving at permit acquisition (prelicense); at licensure; and at 3, 6, and 12 months postlicensure.

Checkpoints Intervention

The goal of the Checkpoints Program is to increase parental restrictions of high-risk driving among novice teenaged drivers. Delivery of the educational materials was timed to reflect the driving experience of study participants. Families in the intervention group received a video soon after recruitment, a series of 8 newsletters during the learner's permit period, and 10 additional newsletters during the first 6 months postlicensure. These materials were designed to explain the risks of adolescent driving, the normative expectations for parental restrictions, and the benefits of adopting the Checkpoints Parent–Teen Driving Agreement as an effective means of reducing driving risks. Prior to an adolescent's eligibility to obtain a driver's license, families were mailed a copy of the Checkpoints Parent–Teen Driving Agreement, which is designed to encourage parents to strictly limit adolescent driving under high-risk conditions such as at night and with teenaged passengers; gradually allow more driving privileges as adolescents gain driving experience and show responsible driving behavior; and help parents establish clear driving rules for their adolescent children, define consequences of rule violations, and identify markers of experience and success.

Measures

All measures were adapted from our program of research on young drivers. Variables of interest included those related to limits on adolescent driving from follow-up interviews at licensure and at 3, 6, and 12 months postlicensure.

Before licensure, parents and adolescents reported how often (on a 5-point scale ranging from "almost always" to "almost never") the adolescents would be allowed to drive under 12 conditions (α=.80 for parent reports; α=.84 for adolescent reports). At licensure and at 3, 6 (adolescents only), and 12 months postlicensure, parents and adolescents reported on each of 4 variables related to driving limits, each assessed with a 5-point scale. Teenaged-passenger limits were assessed by asking how many teenaged passengers were allowed (from "no limits" to "no teenagers"). High-speed-road limits were assessed by asking which types of roads (from "no limits" to "neighborhood only") teenaged drivers were allowed to use when driving. Weekday night restrictions and weekend night restrictions were assessed by asking how late at night (from "after 11 PM" to "by 8 PM") teenagers were allowed to drive. Families were also asked whether they were using the Checkpoints Parent–Teen Driving Agreement ("yes" or "no").

Parents and teenaged drivers reported at licensure whether they had watched the video and read the newsletters, how useful they thought the videos and newsletters were, and whether they had discussed these educational materials with their child or parent. Similarly, parents and teenaged drivers reported at licensure whether they had completed the driving agreement, and intervention families were asked what they thought of the agreement.

Statistical Analysis

Means were graphed to show driving limits expected on licensure, termed "prelicense expected limits." Separate composite scores of driving limits were derived for parents (Cronbach α=.65) and adolescents (Cronbach α=.65) by adding the scores for teenaged-passenger limits, high-speed-road limits, weekday-night restrictions, and weekend-night restrictions. Higher scores reflect stricter limits; *t* tests were conducted to assess treatment group differences for each driving limit and composite scores for driving limits. Path analysis models were developed to describe the effects of treatment on driving limits, after control for other possible associations.

RESULTS

Most families reported using the intervention materials. Of 145 parent–adolescent dyads in the intervention group, most watched the video; discussed it with their parents or children; and thought it was easy to view, interesting, informative, and relevant to their families. Also, most intervention parents and adolescents read at least "some" of the newsletters before and after licensure; discussed them with their parents or adolescents, thought the newsletters were easy to read, interesting, appealing, and relevant; and said that they would recommend them to other families with teenaged drivers.

Fewer than half of parents and adolescents reported actually completing the Checkpoints Parent–Teen Driving Agreement. Of those who did complete the agreement, most were satisfied with its format, terms, and process, and all of the parents said that they would recommend it to other families. In the intervention group, 44% of parents and 48% of adolescents reported adopting the agreement, and 84% of adopting parents and 72% of adopting adolescents reported still using the agreement at 3 months, and 73% of parents and 54% of adolescents reported still using it at 12 months. In the comparison group, 44% of parents (n=71) and 25% of adolescents (n=40) reported completing a driving agreement at licensure, and of these, 21% of parents (n=28) and 32% of teenaged drivers (n=24) reported still using it at 3 months.

Figure 1 shows parent and adolescent reports for prelicense expected driving limits. Parents reported that they expected to set strict limits on teenaged driving, such as getting permission for each trip and reporting destinations, teenaged passengers, and return times. Expected restrictions were lowest for driving at night, with 1 teenaged passenger, and on high-speed roads. Scores for parents and adolescents did not differ significantly by treatment group.

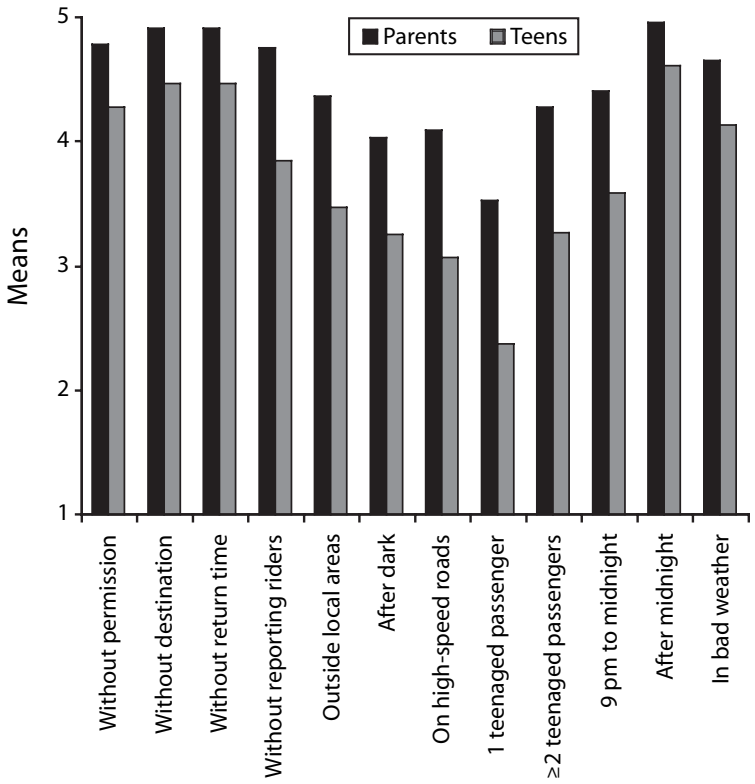

FIGURE 1—Expected driving limits reported by parents and adolescents at prelicensure. Scores did not differ by treatment group.

Means for the following variables were compared by *t* test: limits on teenaged passengers, limits on use of high-speed roads, nighttime curfews for weekdays and weekends, and composite scores for all driving limits (Table 1). Results indicated that all adolescent and parent measures of driving limits differed by treatment group at licensure and at 3 months postlicensure. At 6 months, when only adolescent reports were collected, adolescents in the intervention group reported greater restrictions on number of teenaged passengers, use of high-speed roads, weekend night driving, and overall driving. By 12 months, adolescent-reported group differences were significant for high-speed-road limits, weekend night restrictions, and composite score for driving restrictions; parent-reported treatment differences were significant only for high-speed-road limits and weekend driving restrictions. Figure 2 shows composite driving restrictions from licensure to 12 months postlicensure for parents and adolescents in the treatment and comparison groups.

To examine patterns of limits on adolescent driving, separate multivariate path analyses were conducted for parents and adolescents (Figure 3). Included in each model are prelicense expected driving limits restrictions, adolescent gender, parent gender, adolescent age at licensure, treatment group, and composite scores for driving limits at licensure and at 3, 6, and 12 months postlicensure. Both models provided good fit and were very similar. Exposure to treatment (being in the intervention group) directly predicted driving limits at licensure and at 3 months and indirectly predicted driving limits at 6 and 12 months through limits at licensure and 3 months. Being in the intervention group and having greater prelicense expected limits predicted greater limits at licensure. Being in the intervention group, having prelicensure expected limits, and female parent gender predicted greater limits at 3-months postlicensure. Limits at 3 months, younger age at licensure, and female parent gender predicted greater limits at 6 months postlicensure. Limits at licensure and 6-months and younger age at licensure predicted greater limits at 12 months postlicensure. The parent model (not shown) was similar, except that we found no age-related effect at licensure.

DISCUSSION

A combination of policy and education may be needed to reduce adolescent crash risks.[19] In previous research, we demonstrated that exposure to the Checkpoints Program increased the initial extent and duration of parental restrictions on adolescent driving.[27,28] Our study demonstrated favorable treatment group effects through 12 months postlicensure.

Reported exposure to the intervention materials was reasonably high, and satisfaction with the materials was also high. Although the materials were of high interest to the target population and were brief, colorful, attractive, and easy to read, it was not clear at the beginning of the study whether families would respond to mailed messages, particularly given that the Checkpoints Program was not formally identified with the Department of Motor Vehicles or any major Connecticut institution. Although less than half of the intervention families completed the Checkpoints Parent–Teen Driving Agreement at licensure, about the same percentage of comparison families reporting the use of a driving agreement, a much higher percentage of intervention parents and adolescents reported continuing use of the driving agreement throughout the first year of licensure.

As expected, before licensure, parents and adolescents anticipated having driving restrictions after licensure, applied restrictions on licensure, and reduced limits rapidly thereafter. Mothers maintained somewhat greater and longer-lasting limits than did fathers, and limits were greater and longer lasting for teenaged drivers who were younger at licensure. As has been demonstrated in other research,[23] expected restrictions were highest for trip permission, trip destinations, and re-

TABLE 1—Treatment Group Differences (Unadjusted Means and *t* Test Results) for Limits on Adolescent Driving: August 2000–March 2003

	Intervention Group		Comparison Group		
	No.	Mean (SD)	No.	Mean (SD)	*t* Test
Licensure reports					
Teenaged-passenger limits					
Parent reporting	144	2.53 (1.06)	159	2.28 (1.05)	2.02*
Adolescent reporting	145	2.16 (1.33)	159	1.57 (1.46)	3.65***
High-speed road limits					
Parent reporting	144	1.75 (1.35)	159	1.39 (1.26)	2.41*
Adolescent reporting	145	1.03 (1.20)	159	0.50 (0.95)	4.24***
Weekday driving restriction					
Parent reporting	144	3.19 (1.04)	159	2.84 (1.19)	2.72**
Adolescent reporting	143	2.77 (1.38)	146	2.08 (1.47)	4.14***
Weekend driving restriction					
Parent reporting	144	2.42 (1.20)	159	1.72 (1.10)	5.36***
Adolescent reporting	139	1.83 (1.37)	148	1.21 (1.21)	4.11***
Composite score for driving limits					
Parent reporting	144	9.89 (3.38)	159	8.23 (3.04)	4.51***
Adolescent reporting	137	7.66 (3.67)	141	5.38 (3.47)	5.38***
3-month reports					
Teenaged-passenger limits					
Parent reporting	124	2.15 (1.18)	135	1.79 (1.25)	2.38*
Adolescent reporting	124	1.56 (1.42)	136	1.01 (1.28)	3.24**
High-speed road limits					
Parent reporting	124	1.40 (1.26)	135	0.99 (1.13)	2.76**
Adolescent reporting	124	0.69 (1.06)	136	0.38 (0.73)	2.70**
Weekday driving restriction					
Parent reporting	124	2.82 (1.18)	135	2.43 (1.24)	2.60**
Adolescent reporting	123	2.24 (1.34)	129	1.82 (1.48)	2.37*
Weekend driving restriction					
Parent reporting	124	1.78 (1.09)	135	1.41 (1.03)	2.84**
Adolescent reporting	120	1.24 (1.08)	131	0.89 (1.12)	2.49*
Composite score for driving limits					
Parent reporting	124	8.16 (3.10)	135	6.62 (3.03)	4.04***
Adolescent reporting	119	5.68 (3.32)	126	4.10 (3.19)	3.79***
6-month reports					
Teenaged-passenger limits					
Parent reporting[a]	…	…	…	…	…
Adolescent reporting	…	…	…	…	…
High-speed road limits					
Parent reporting[a]	130	1.37 (1.17)	150	1.03 (1.03)	2.61**
Adolescent reporting	130	0.45 (0.86)	150	0.26 (0.68)	2.02*
Weekday driving restriction					
Parent reporting[a]	…	…	…	…	…
Adolescent reporting	127	2.39 (1.25)	139	2.22 (1.37)	NS
Weekend driving restriction					
Parent reporting[a]	…	…	…	…	…
Adolescent reporting	126	1.16 (1.03)	141	0.84 (0.89)	2.74**
Composite score for driving limits					
Parent reporting[a]	…	…	…	…	…
Adolescent reporting	125	5.38 (2.94)	136	4.35 (2.58)	3.02**

Continued

turn times and lowest for risk conditions, particularly for teenaged passengers, high-speed roads, and driving after dark.

Group differences were observed in most driving limits through 6 months and on composite limits through 12 months, although some specific limits diminished over this period. Driving limits were greatest at licensure for both groups but were lower than prelicense expected limits and declined substantially between licensure and 3 months postlicensure. Parents reported somewhat greater restrictions than did adolescents; this gap suggests that either parents do not clearly communicate their intended restrictions to their adolescents or that adolescents are somewhat selective in how they interpret parental restrictions. The modest level of restriction on number of teenaged passengers is particularly troubling, because crash risks increase dramatically with each additional teenaged passenger.[9–13]

In adjusted multivariate analyses, the treatment group was directly associated with composite driving limits at licensure and at 3 months postlicensure and indirectly at 6 and 12 months postlicensure through the treatment effects on limits at licensure and at 3 months postlicensure. Surprisingly, adolescent gender was not significantly associated with restrictions at any point. Adolescents who were older at licensure reported fewer parental restrictions at 6 months and 12 months but not during the critical first 3 months of licensure.

The primary effect of the Checkpoints Program was to increase restrictions at licensure and at 3 months postlicensure; this increase provided indirect effects at 6 and 12 months postlicensure. This finding highlights the importance of targeting initial driving limits and suggests that the primary function of adoption of a parent–adolescent driving agreement was to establish initial driving privileges. As with other behaviors in which children's successful negotiation for greater independence creates a new "set point," once an adolescent is allowed to drive with several teenaged passengers in the car or stay out with the car after midnight, it is difficult to restrict this behavior. In light of this observation, the value of the Checkpoints Parent–Teen Driving Agreement was to clearly establish initial

TABLE 1—*Continued*

		12-month reports			
Teenaged-passenger limits					
Parent reporting[a]	112	1.69 (1.13)	138	1.68 (1.27)	NS
Adolescent reporting	114	1.04 (1.28)	139	0.75 (1.25)	NS
High-speed road limits					
Parent reporting[a]	114	0.88 (1.11)	139	0.58 (1.03)	2.18*
Adolescent reporting	113	0.31 (0.77)	139	0.14 (0.44)	2.14*
Weekday driving restriction					
Parent reporting[a]	105	2.48 (1.23)	123	2.24 (1.36)	NS
Adolescent reporting	104	2.32 (1.33)	129	2.11 (1.36)	NS
Weekend driving restriction					
Parent reporting[a]	108	1.27 (0.94)	127	0.94 (0.84)	2.84**
Adolescent reporting	106	0.77 (0.77)	131	0.57 (0.81)	1.94*
Composite score for driving limits					
Parent reporting[a]	100	6.23 (2.90)	117	5.60 (2.88)	NS
Adolescent reporting	100	4.50 (2.78)	125	3.54 (2.57)	2.69**

[a]Parent reports were not collected at 6 months postlicensure.
*P < .05; **P < .01; ***P < .001.

driving privileges and limits and to reduce the rate at which restrictions declined during the first year of driving. Notably, the Checkpoints intervention activities were implemented only through 6 months postlicensure; a residual effect at 12 months is a surprising bonus, because the effects of passive interventions typically diminish rapidly after cessation.

The generalizability of this study is limited by the nonrepresentative socioeconomic status of the study population (participants were mostly from higher socioeconomic groups) and by some differences in follow-up between treatment groups. Overall, the sample was too small to detect any impact on crash rates, and the extent to which the modest treatment-group differences would be sufficient to protect against serious crashes is not clear. However, the study did demonstrate the efficacy of the Checkpoints Program, a relatively simple, passive, and inexpensive behavioral intervention. Because most parents do restrict early adolescent driving, it may be possible, through simple interventions such as those included in the Checkpoints Program, to increase initial restrictions and foster maintenance of restrictions for up to 12 months postlicensure—the period when crash rates are highest for novice teenaged drivers. The Checkpoints Program could be adapted as a practice model for wide implementation in a variety of settings, complementing and increasing the effects of GDL to reduce motor vehicle crashes among young drivers. ■

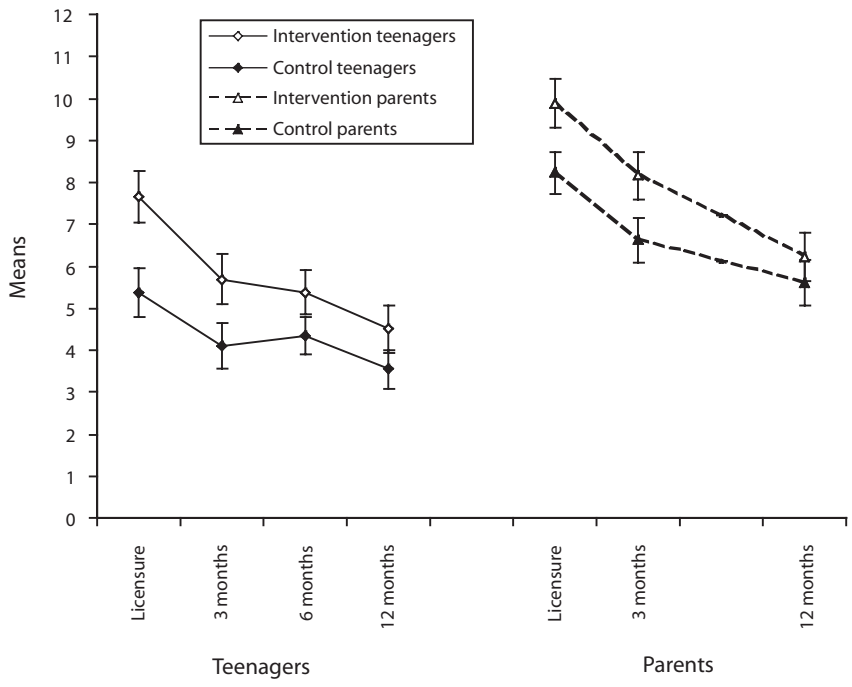

FIGURE 2—Adolescent-reported and parent-reported composite scores (unadjusted means and 95% confidence intervals) for driving limits.

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Contributors

All authors helped to conceptualize ideas, interpret findings, and reviewed drafts of the article. B. Simons-Morton originated the study and oversaw all aspects of study development and implementation, statistical analysis, and writing of the article. J.L. Hartos was involved in intervention and measurement development, conducted the analyses, and was involved in the writing of the article. D.F. Preusser contributed to the study design and contributed to the development and conduct of the study and the final draft of the article. W.A. Leaf contributed to the study design and was involved in the day-to-day management of all aspects of the study, including measurement, intervention, and article writing.

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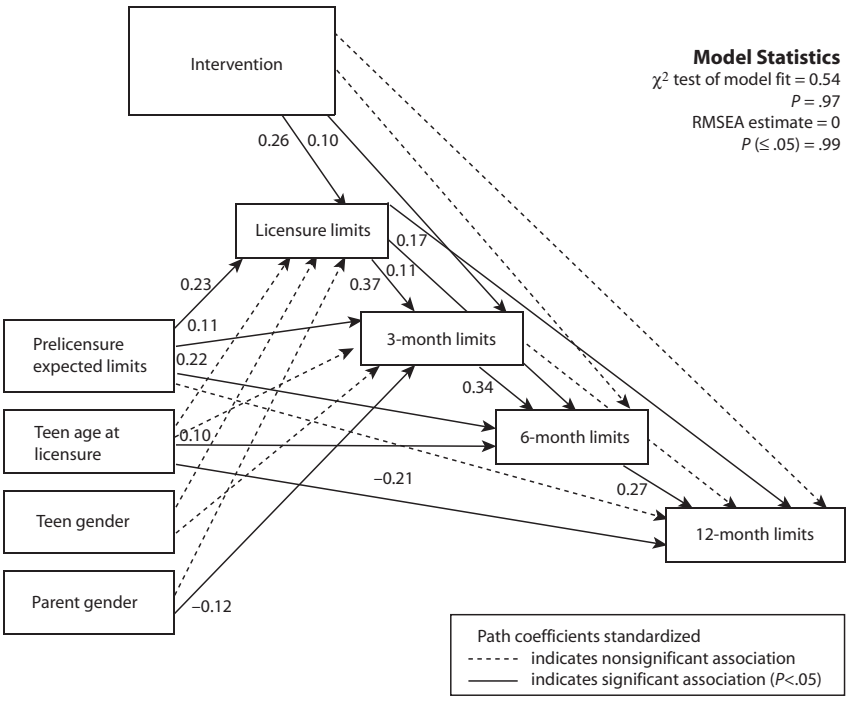

Note. RMSEA = root mean square error of approximation.

FIGURE 3—Multivariate path model for adolescent reports of composite driving limits during the first year of adolescent licensure.

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Human Participant Protection

The study was approved by institutional review boards of the National Institute of Child Health and Human Development and the Preusser Research Group, Inc. Parental consent and adolescent assent were obtained according to procedures approved by the institutional review board of the National Institute of Child Health and Human Development.

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