

CHIS Working Paper Series

Too Protective to Grant Permission? Understanding Factors Impacting Parental Permission in Surveying Adolescents

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Summary

The California Health Interview Survey (CHIS) has been consistently collecting health data regarding adolescents aged 12-17 for over two decades. However, due to decreases in the parental permission rate, which is the most substantial contributor to adolescent nonresponse, CHIS redesigned the adolescent recruitment procedure to improve the parental permission rate and adolescent cooperation in 2019-2020. This redesign has been proven effective in improving these rates. However, the factors impacting parental permission in CHIS adolescent recruitment merit further exploration.

This paper analyzes data from CHIS 2017-2018 and CHIS 2019-2020 focusing on surveyed households with an eligible adolescent and explores parent and adolescent demographic and socioeconomic characteristics impacting permission, through use of logistic regression. The interaction effect between parent and adolescent characteristics is also examined. Statistical results show that in the 2017-2018 adolescent recruitment design, older parents are more willing to grant permission than younger parents, while the situation reverses in the 2019-2020 redesign. Male and Asian parents are less willing to grant permission regardless of adolescent recruitment design. Under the 2019-2020 redesign, older parents with younger adolescents experience the lowest permission rates. Finally, this paper also concludes with a discussion of the recommendations on future CHIS adolescent data collection approaches from these findings.

Introduction

CHIS Redesigned Adolescent Recruitment Procedure

The California Health Interview Survey (CHIS) has been consistently collecting health data regarding adolescents aged 12-17 for over two decades. However, the CHIS overall adolescent response rate shows a continuing downward trend since the inception of CHIS and reached the lowest point in the 2017-2018 cycle with only 1.7%. In CHIS 2019-2020, the redesigned adolescent recruitment is implemented and has been proven efficient in recruiting adolescent respondents. Under the redesigned adolescent recruitment, parental permission rate doubles while the adolescent completion rate is still maintained at a high level (Wells, B. M. et al., 2022). The downward trend is reversed in 2019 with 4.1% overall response rate and continues to increase when including CHIS 2020 data (5.4%).

There are three components in the redesigned adolescent recruitment, including obtaining parental permission, adolescent recruitment, and parental permission conversion.

The first step is to obtain permission from parents. CHIS requests explicit parental consent to interview an eligible adolescent halfway during the adult interview. If the surveyed parent refuses to grant permission, an additional request is made to allow the parent to opt their

adolescent out of sensitive content such as questions regarding drug use and sexual activity. CHIS provides adolescents with a \$10 promised incentive for finishing the survey. If the parent is interviewed by phone, the interviewer will attempt an adolescent interview, if the adolescent is present, after the adult interview.

After obtaining parental permission in the web survey, CHIS contacts the adolescent by nested mailing which includes a letter to parent and a separate sealed envelope for the eligible adolescent with a letter inside that contains instructions for completing the survey. A text reminder will be sent if the parent provides the adolescent phone number. Additionally, with an adolescent phone number, an interviewer will interview the adolescent by phone. If parental permission is not given, CHIS will ask for reconsideration by sending a letter to the parent and offering the parent a \$10 promised incentive once the adolescent interview is completed.

While the various new recruitment features demonstrate effectiveness in boosting the parental permission rate, the factors that impact parental permission in CHIS adolescent recruitment merits further exploration, to benefit future CHIS adolescent data collection and to reduce total survey error. This report seeks to answer this question in an analytical way and discusses recommendations on future CHIS adolescent recruitment design.

Parental Permission

Parental informed consent aims to protect minors from risks associated with a research study. This protocol ensures that parents or guardians are well-informed about the purpose, benefits, and harms to make decisions about their ward's participation (Liu et al., 2017). In most social and epidemiological research with adolescents, parental permission or consent is required. However, there are studies focusing on benefits from waiving parental permission (Rojas et al, 2008; Ruiz-Canela et al., 2013). Although few studies focus on parental permission under a survey methodology context, it is more abundant in public health or epidemiology settings, especially with sensitive topics (such as adolescent HIV or substance use research). For example, studies show that the reported risk behavior rate (e.g., marijuana or alcohol use) is significantly higher among students whose parents waive consents, compared with students with parental consents (Severson et al., 1983; Rojas et al., 2008). One possible explanation is that population-based surveys rarely collect data from adolescents through household frames, and it is more common to use school-based frames, which is naturally an ideal sample frame for complex survey design, such as stratification by schools or cluster sampling by classes.

Therefore, this section will broadly discuss the role that parental permission plays in social science or public health research, how it impacts adolescent reaction during the research and what are predictors to predict parental permission for adolescent participation from existing empirical studies.

Active consent procedure vs. passive consent. Parental consent is classified as either an active consent procedure or a passive consent procedure. Multiple empirical studies prove that there is substantive difference regarding participant willingness between studies using active consent or passive consent. Existing studies with active parental consent report response rate from 29% to 90% (Lueptow et al., 1977; Kearney et al., 1993; Ellickson & Hawes 1989; Esbensen et al., 1996; Courser et al., 2009), while studies using passive consent procedures report response rates from 79% to 100% (Ellickson & Hawes 1989; Kearney et al., 1993; Esbensen et al., 1996; Pokorny et al., 2001; Eaton et al., 2004; Langhinrichsen-Rohling et al., 2006). Meta-analysis also demonstrates that response rates are significantly lower for studies with active consent than those using passive consent procedures (Liu et al., 2017).

Selection bias also arises from active parental permission. Lower response rate from specific parental/adolescent characteristics may systematically filter adolescents out of a research study. Previous studies show that active consent leads to overrepresenting female and Caucasian students (Dent et al., 1993; Anderman et al., 1995), and students with high academic achievement (Lueptow et al., 1977; Kearney et al., 1993; Esbensen et al., 1993), while underrepresenting African American and Asian students, Hispanic youth (Kearney et al., 1993; Esbensen et al., 1999), and children whose parents are less educated (Dent et al., 1993; Anderman et al., 1995).

Predictors of parental permission. Past study explores predictors of parental consent for adolescent participation in sexual health related research via an online survey (Moilanen 2015). Results show that parents who are highly extraverted, view science positively, not conservative about sexuality and think teenager is already sexually experienced are more likely give consent. However, in this study, parents or legal guardians are recruited online in a non-probability way, leading to a biased sample mainly containing female, European American and located in the southern United States.

Research Question

As discussed previously, it is still unchartered territory to predict parental consent under population-based surveys through household frames. This paper aims to explore factors impacting parental permission in CHIS adolescent recruitment.

Methods and Results

This study is conducted using CHIS 2017-2018 and 2019-2020 datasets. Granting adolescent permission from parents (Yes/No) is the outcome variable of interest in the models. The following parent characteristics were included as covariates in the analysis: age in years (25-39, 40-49, 50+), gender (Male/Female), race (Asian, Hispanic, Other), marital status (Single/Other, Married/Partner), place of birth (US-Born, Foreign-Born), poverty status (0-199% FPL, 200% FPL & Above), and educational attainment (College Graduate, Not a College Graduate) and number

of eligible adolescents (One Adolescent, More Than One Adolescent). Adolescent characteristics included as covariates in the analysis were age in years (12-15, 15-17) and adolescent gender (Male/Female). Table 1 presents the descriptive statistics of the variables included in the models. Both unweighted and design-adjusted models were created using these covariates: a main effects model and a two-way interaction effects model. The two-way interaction effects model includes an interaction term between parent age and adolescent age groups.

		2017-2018	2019-2020
Parental Charact	teristic		
Gender	Male	1,572 (40.2%)	1,946 (38.8%)
	Female	2,337 (59.8%)	3,066 (61.2%)
Age	25-39	736 (18.9%)	748 (15.0%)
	40-49	1,662 (42.7%)	2,357 (47.3%)
	50+	1,492 (38.4%)	1,878 (37.7%)
Race/Ethnicity	Asian	296 (7.6%)	767 (15.3%)
	Hispanic	1,374 (35.2%)	1,443 (28.8%)
	Other	2,239 (57.2%)	2,802 (55.9%)
Poverty Status	0-199% FPL	1,346 (34.4%)	1,175 (23.4%)
	200%+ FPL	2,563 (65.6%)	3,837 (76.6%)
Education	College Grad	1,759 (45.0%)	2,907 (58.0%)
	Not College Grad	2,150 (55.0%)	2,105 (42.0%)
Birth of Place	Foreign-Born	1,295 (33.1%)	1,560 (31.1%)
	US-Born	2,614 (66.9%)	3,452 (68.9%)
Marital Status	Married/Partnered	3,052 (78.1%)	4,058 (81.0%)
	Single/Other	857 (21.9%)	954 (19.0%)
Teen Eligible	One Teen	1,361 (34.9%)	3,373 (67.3%)
	More Than One Teen	2,583 (65.1%)	1,637 (32.7%)
Adolescent Characteristic			
Age	12-14	2,227 (48.2%)	1,842 (38.3%)
	15-17	2,390 (51.8%)	2,970 (61.7%)
Gender	Male	2,374 (51.2%)	2,472 (50.3%)
	Female	2,260 (48.8%)	2,440 (49.7%)

CHIS data is population-based survey data with complex survey design, and both sampling design and post data collection adjustment will impact bivariable analysis and regression model results (e.g., coefficients and standard errors). Therefore, it is necessary to include design-adjusted models in this paper to make comparison with unweighted models.

The following section will start with examining association between parent/adolescent characteristics with permission status with design-based statistics, followed by main effect models and interaction effect models in unweighted and design-adjusted logistic regression models respectively under both old (2017-2018) and new (2019-2020) adolescent recruitment design. Additionally, model evaluation and selection will also be discussed. Stata 16.1 is utilized in the following statistical analysis.

		Permission Status 2017-2018		Permission Status 2019-2020	
Predictor	Category	Yes	No	Yes	No
	Male	33.2%	66.8%	56.2%	43.8%
Gender ⁺⁺⁺	Female	34.9%	65.1%	66.9%	33.1%
	25-39	25.2%	74.8%	70.4%	29.6%
	40-49	36.5%	63.5%	60.6%	39.4%
Age***, +++	50+	37.8%	62.2%	58.0%	42.0%
	Asian	28.3%	71.7%	48.5%	51.5%
	Hispanic	31.4%	68.6%	65.6%	33.4%
Race/Ethnicity ^{**, +++}	Other	38.9%	61.1%	62.4%	37.6%
	0-199% FPL	31.3%	68.7%	65.0%	35.0%
Poverty Status ⁺	200%+ FPL	35.9%	64.1%	60.0%	40.0%
	College Grad	37.9%	62.1%	57.1%	42.9%
Education ^{**, +++}	Not College Grad	31.9%	68.1%	64.7%	35.3%
	Foreign-Born	31.2%	68.8%	61.1%	38.9%
Birth of Place [*]	US-Born	36.7%	63.3%	62.9%	37.1%
	Married/Partnered	34.5%	65.5%	62.0%	38.0%
Marital Status	Single/Other	32.6%	67.4%	62.1%	37.9%
	One Teen	34.2%	65.8%	60.4%	39.6%
Adolescents Eligible ⁺	More Than One	34.3%	65.7%	65.8%	34.2%
	12-14	34.2%	65.8%	64.4%	35.6%
Adolescent Age	15-17	34.6%	65.4%	62.3%	37.7%
	Male	34.5%	65.5%	60.5%	39.5%
Adolescent Gender⁺	Female	34.1%	65.9%	64.3%	35.7%

Bivariate Analysis

*: p <0.1 (2017-2018) +: p <0.1 (2019-2020)

**: p<0.05 (2017-2018) ++: p<0.05 (2019-2020)

***: p<0.01 (2017-2018) +++: p<0.01 (2019-2020)

Note 1: Rao-Scott F-Test is employed as the deviation of test in this bivariate analysis, which is applied to test null hypothesis of no association between two variables under complex survey design.

Table 2 presents the weighted proportions using 2017-2018 and 2019-2020 data, including parent/adolescent demographics and parent socioeconomic status. Based on the initial bivariate analyses, overall, we observe that parent demographics show stronger impact on permission status over socioeconomic status.

Due to the redesign, the proportions for permission status "Yes" in 2019-2020 are saliently higher than "No" throughout almost all variables, which is the opposite situation for the old adolescent recruitment design. While the Yes-No proportions reverse from old to the new design, some demographic characteristics still show consistent strong association with permission status, like parent age and race/ethnicity from 2017 to 2020. Asian parents have least willingness to grant permission to their adolescents regardless of old and new adolescent recruitment design, with statistically significant association. However, in terms of age, the older parents are, the more willing they become to provide permission under the old design, while under the new design, the trend is opposite.

While some variables do not have significant association with adolescent permission status, we still include them in the following multivariable analyses, as control variables.

Model Comparisons and Interpretations

Table 3. Unweighted Logistic Regression of Parental Permission for Adolescents

	(0.083)	(0.081)	(0.083)	(0.081)	
0-199% FPL	1.004	0.973	1.007	0.978	
	(0.084)	(0.081)	(0.085)	(0.081)	
Education: Not A College	0.855**	0.958	0.855	0.958	
Graduate					
	(0.066)	(0.066)	(0.066)	(0.066)	
Adolescents Eligible:	0.995	1.107	0.997	1.112	
More Than One Teen					
	(0.070)	(0.075)	(0.071)	(0.077)	
Adolescent Characteristic					
Age 12-14	1.065	0.865**	1.355*	1.252	
	(0.073)	(0.058)	(0.237)	(0.208)	
Female	0.935	1.074	0.933	1.075	
	(0.063)	(0.065)	(0.063)	(0.065)	
Parent/Adolescent Interactions					
40-49 # 12-14			0.799	0.691**	
			(0.162)	(0.129)	
50+ # 12-14			0.698*	0.593***	
			(0.145)	(0.118)	
Intercept	0.468***	1.590***	0.399***	1.257	
	(0.064)	(0.197)	(0.070)	(0.195)	

*: p <0.1; **: p <0.05; ***: p <0.01

Note 1: 2017-2018 sample size n=3,826; 2019-2020 sample size n=4,779.

Note 2: Reference categories for categorical variables: Age (25-39 years), Marital Status (married/partnered), Race/Ethnicity (non-Asian & non-Hispanic), Federal Poverty Level (200%+ FPL), Education (college graduate), Number of Eligible Adolescents (one adolescent), Adolescent Age (15-17 years).

First, unweighted logistic regression models are examined. Odds ratios associated with standard errors are reported in Table 3. Age shows mixed impact from old to new design, with statistical significance. In 2017-2018 data, older parents are more about 60% of the odds of youngest parents (25-39). However, in 2019-2020, the odds ratio of parent age (40-49) is 0.83, indicating that the odds of parents aged 40-49 granting their adolescent permission are less about 17% of the odds of parents aged 25-39 granting their adolescent permission, holding all other variables constant.

Parent gender (female) shows consistent positive impact on permission. However, the impact is even stronger under the new design. The odds of gender (female) giving permission is 18% higher than the odds of male parents. Under the new design, it increases by 60% higher than male parents.

Similar to results from bivariate analysis, Asian parents are least willing to grant permission. The exponentiated coefficient of parent race (Asian) is 0.51 in 2019-2020 model, indicating that the odds of an Asian parent granting permission are about 49% less than the odds of a non-Hispanic and non-Asian parent granting permission.

	Main Effect Model		Interaction Eff	ect Model
	2017-2018	2019-2020	2017-2018	2019-2020
	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio
	(Std. Err.)	(Std. Err.)	(Std. Err.)	(Std. Err.)
Parental Characteristic				
Age				
40-49	1.686***	0.712**	1.941*	1.035
	(0.287)	(0.099)	(0.672)	(0.147)
50+	1.808***	0.715**	2.284**	1.040
	(0.357)	(0.103)	(0.739)	(0.150)
Female	1.182	1.651***	1.180	1.637***
	(0.175)	(0.148)	(0.175)	(0.147)
Marital Status: Single	0.944	0.865	0.949	0.867
	(0.167)	(0.108)	(0.169)	(0.108)
Race/Ethnicity				
Asian	0.597**	0.504***	0.595**	0.502***
	(0.147)	(0.070)	(0.145)	(0.069)
Hispanic	0.847	1.034	0.844	1.055
	(0.154)	(0.118)	(0.152)	(0.123)
Foreign-born	0.922	1.000	0.931	1.014
	(0.167)	(0.102)	(0.169)	(0.102)
0-199% FPL	0.960	0.980	0.957	0.977
	(0.1648)	(0.105)	(0.166)	(0.106)
Education: Not A College	0.890	1.161	0.895	1.161
Graduate				
	(0.134)	(0.109)	(0.136)	(0.112)
Adolescents Eligible:	0.975	1.238*	0.981	1.245*
More Than One				
Adolescent				
	(0.118)	(0.135)	(0.120)	(0.137)

Table 4. Design-Adjusted Logistic Regression of Parental Permission for Adolescents

Adolescent Characteristic					
Age 12-14	1.037	1.082	1.346	2.167***	
	(0.118)	(0.099)	(0.472)	(0.510)	
Female	0.983	1.194**	0.979	1.196**	
	(0.131)	(0.097)	(0.130)	(0.096)	
Parent/Adolescent Interactions					
40-49 # 12-14			0.797	0.479***	
			(0.355)	(0.126)	
50+ # 12-14			0.614	0.312***	
			(0.268)	(0.091)	
Intercept	0.409***	1.456**	0.347***	0.990	
	(0.104)	(0.256)	(0.119)	(0.191)	

*: p <0.1; **: p <0.05; ***: p <0.01

Note 1: 2017-2018 sample size n=3,826; 2019-2020 sample size n=4,779.

Note 2: Reference categories for categorical variables: Age (25-39 years), Marital Status (married/partnered), Race/Ethnicity (non-Asian & non-Hispanic), Federal Poverty Level (200%+ FPL), Education Level (college graduate), Number of Eligible Adolescents (one adolescent), Adolescent Age (15-17 years).

As suggested by the CHIS survey methodology report (*CHIS 2019-2020 Methodology Series: Report 5 – Weighting and Variance Estimation*), a Jackknife variance estimation approach is employed for the design-adjusted logistic regressions using 80 CHIS replicate weights.

As shown in Table 4, the design-adjusted logistic regression models are similar to unweighted models in some ways while different in others. The characteristics saliently impacting adolescent permission to participate in CHIS survey are almost identical to unweighted models in the same direction in both 2017-2018 and 2019-2020 models. For example, in 2019-2020, the odds of parents aged 50+ granting adolescent permission to take part in CHIS survey is roughly 30% less than the odds of parents aged 25-39. Similarly, Asian parents are less willing to give their adolescents permission, with 50% less odds of non-Hispanic and non-Asian parents across four design-adjusted models.

In terms of standard errors, we see inflation in design-adjusted models compared with unweighted models, which is mainly anticipated. When informative complex survey design is considered in logistic regression, it usually leads to swelling standard errors.



Figure 1. Unweighted and Design-adjusted Estimated Marginal Effects of Interaction Terms (2017-2018)

Next, we will scrutinize interaction terms by estimated marginal effects of interaction terms in multivariable models. Figure 1 plots the predicted probability of parents granting adolescent permission by interaction terms (parents vs. adolescent age groups) in 2017-2018, for unweighted and design-adjusted logistic model.

We see the slightly upward trend of predicted probability of granting permission, as parents become older both for younger (12-14) and older adolescents (15-17), the predicted probability rising from ~0.2 to ~0.4. However, the 95% confidence intervals do overlap within and between parent age groups and we cannot conclude that there is significant parent/adolescent age interaction effect in the old adolescent recruitment design.



Figure 2. Unweighted and Design-adjusted Estimated Marginal Effects of Interaction Terms (2019-2020)

Figure 2 plots the predicted probability of parents granting adolescent permission by interaction terms (parents vs. adolescent age groups) under the new adolescent recruitment design in 2019-2020, for unweighted and design-adjusted logistic model.

Figure 2 shows that there is little difference in predicted probability of granting older adolescent (15-17) permission by parent age groups, regardless of unweighted and designadjusted model. However, in terms of adolescents aged 12-14, we observe significant differences between parents 25-39 and 50+ groups. Overall, the older the parents are, the less willing they become to grant permission to their younger adolescents to participate in the CHIS web survey. In the unweighted logistic regression model, the predicted probability of parents aged 25-39 granting younger adolescent permission is 0.67, while for parents aged 50+, the predicted probability is 0.56. The gap even widens in design-adjusted regression models. The predicted probability of parents aged 25-39 granting younger adolescent permission is 0.76, while it goes down to 0.55 for parents aged 50+.

Finally, the intercept in both models is interpreted as the odds of granting adolescent permission to participate in the CHIS web survey for a US-Born, married, non-Asian and non-Hispanic, college-educated male parent aged between 25 to 39 with poverty status FPL 200% or above, whose only eligible child is a male adolescent aged 15-17 years old.

Model Evaluation and Selection

For the unweighted logistic regression models, we observe that when interaction terms are added, the pseudo-R square increases, indicating that interaction term gives more explanatory power in the model.

As for design-adjusted logistic regression models, while there is no pseudo-R square measuring the goodness of fit, we apply Archer and Lemeshow's (2016) design-adjusted test (F_{A-L}) to gauge the overall goodness of fit for design-adjusted logistic models. The design-adjusted *F*-statistics show that F_{A-L} (9, 71) with p-value 0.87 and F_{A-L} (9, 71) with p-value 0.50 for 2017-2018 main effect and interaction effect model separately, and F_{A-L} (9, 71) with p-value 0.55 and F_{A-L} (9, 71) with p-value 0.48 for 2019-2020 main effect and interaction effect model respectively. This suggests that we fail to reject the null hypothesis that the model fits well, and therefore we are confident that the design-adjusted regression model with interaction term which has more explanatory power, fits the data well and should be selected as the final model in the analysis.

Conclusions and Recommendations

In our design-based bivariable analysis, we find that there are key demographic and socioeconomic factors affecting parental decisions whether to allow children to participate in the survey. Throughout two waves of data in 2017-2018 and 2019-2020, parental age, parental

ethnicity, and parental place of birth consistently shows statistically significant association with permission status, while adolescent characteristics show tenuous association with parental permission under both old and new CHIS adolescent recruitment design.

The results of design-adjusted models illustrate that among all characteristics of our interest, Asian and male parents are more opposed to granting permission to their adolescents in both the old and new CHIS design for adolescent recruitment. Asian parents demonstrated roughly less 50% odds of granting permission compared with non-Asian and non-Hispanic parents. While parent's gender shows significant impact on permission, being female has a stronger impact under the new CHIS design for adolescent recruitment, with about more 60% odds of male parents.

Overall, our analysis demonstrates that parental permission is more dependent on the parent side than adolescent. However, certain adolescent features are able to amplify the impact from parent characteristics. When we examine the interaction effect model under the new adolescent recruitment design, it shows that for younger adolescents, older parents are more "protective" than the younger. In other words, as the parents become older, their willingness to give younger adolescents permission to take CHIS survey declines precipitously.

The results give us more clear understanding about how parent and adolescent characteristics impact CHIS adolescent recruitment, which could lead to underrepresentation for certain groups. In future CHIS cycles, improvements could be made on either survey sampling design and data collection strategies to compensate for low permission rate from male, Asian parents, or older parents with younger adolescents, such as oversampling these groups or more customized reminders to dispel their doubts on CHIS adolescent survey.

Dissemination

Results in this paper have been presented in a poster session at 2022 American Association for Public Opinion (AAPOR) Conference in Chicago.

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Disclaimer

The analyses, interpretations, conclusions, and views expressed in this working paper are those of the author and do not necessarily represent the UCLA Center for Health Policy Research, the Regents of the University of California, or collaborating organizations or funders.

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