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EXAMINING A HOME ENVIRONMENTAL STRATEGY TO REDUCE AVAILABILITY OF LEGAL PRODUCTS THAT CAN BE MISUSED BY YOUTH

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Abstract

This article presents results from a study of a home environmental strategy (HES) designed to reduce availability of harmful legal products (HLPs) in the home that can be used by youth to get high. HLPs include inhalants, prescription and non-prescription drugs, and household products that can be ingested to get high. Availability is one of the most consistent predictors of substance use among youth. Parents of 5th to 7th-grade students in four Alaskan communities participated in telephone interviews as part of a larger study of a multi-component Community Prevention Model that included a HES. The strategy was designed to encourage parents to reduce availability of HLPs by removing them from the home, and by locking up and monitoring the supplies of HLPs in the home. Data from 402 parents at Wave 1 and 371 parents at Wave 2 were analyzed using Hierarchical Non-Linear Modeling (HNLM). Results show there was a significant decrease in HLPs in the home from Wave 1 to Wave 2, mostly inhalants, prescription and non-prescription drugs. Parents also reported a significant increase in locking up prescription and non-prescription drugs in the home. Parents' direct exposure to the HES was marginally associated with the change over time in HLP availability in the home. Indirect exposure through others and media was not associated with this change. Study lessons learned and conclusions are highlighted.

THE PROBLEM

Harmful legal products (HLPs) are products that are legal for their intended use, yet can be inhaled or ingested to get high (Johnson et al., 2007). HLPs include inhalants, prescription and non-prescription drugs, and some common household products. Use of HLPs by youth represents a unique challenge for prevention because, unlike substances for which access is regulated (alcohol and tobacco) or prohibited (such as marijuana), access to HLPs may be subject to few or no legal restrictions.

Inhalants include substances found in many products that are often available to children (Kurtzman, Otsuka, & Wahl, 2001). Most inhalants, such as paint thinners and gasoline, are volatile solvents that can dissolve other substances (Alberta Alcohol and Drug Abuse Commission, 2004). Other types are aerosols, nitrites (or "poppers"), and anesthetics (Center for Substance Abuse Treatment, 2003; Wu, Schlenger, & Ringwalt, 2005). Nonmedical use of prescription drugs is also an area of great concern (NIDA, 2007; Volkow, 2006). Commonly misused classes of prescription drugs are opioids, central nervous system depressants (which are prescribed for anxiety and sleep disorders), and stimulants prescribed to treat attention-deficit hyperactivity disorder (NIDA, 2005). Nonprescription drugs, such as dextromethorphan (which is found in over-the-counter cough medicines), may also be misused (Cranston & Yoast, 1999). Another type of HLP consists of common household products that can be misused by ingesting them. Examples include aftershave, mouthwash (Egbert, Liese, Powell, Reed, & Liskow, 1986; McKee, 2005), cleaners such as Lysol (Vinje

& Hewitt, 1992), and vanilla extract (Mazor, DesLauriers, & Mycyk, 2005). Most household products that are ingested to get high contain ethyl alcohol (Litovitz, 1986).

Prior research has shown that availability is related to youth use of HLPs (Collins, Harris, Johnson, Shamblen, & Thompson, 2011; Collins, Pan, Johnson, Courser, & Shamblen, 2008; Gruenewald, Johnson, Shamblen, Ogilvie, & Collins, 2009). However, strategies to reduce availability of HLPs that include replacing harmful products with safer ones, and locking up and monitoring supplies of products that can be inhaled or ingested, are limited. Replacing gasoline with aviation gasoline (Avgas) in Australian communities has some documentation (Burns, 1996) and Shaw (1999) found in an impact evaluation that substituting Avgas was effective against petrol sniffing for 18 months. However, D'Abbs and Brady (2004) note there is not an accumulated body of knowledge about the efficacy or effectiveness of interventions to address petrol sniffing.

The Alaska feasibility study (Johnson et al., 2007) did include a retail environmental strategy which showed evidence that retailers can reduce availability of HLPs for misuse by youth (Courser, Holder, Collins, Johnson, & Ogilvie, 2009), yet we are not aware of any published results showing interventions have resulted in decreasing availability of HLPs in the home. The current article addresses this gap in the literature by presenting results from a study of a home environmental strategy (HES) implemented in rural Alaska to reduce availability of HLPs for misuse by targeting parents of 5th to 7th graders in four communities.

HOME ENVIRONMENTAL STRATEGY

The Pacific Institute for Research and Evaluation (PIRE), with funding from the National Institute on Drug Abuse, conducted a feasibility study from 2004 to 2008 of a multi-component community prevention model (CPM) targeting youths' use of HLPs to get high. The components were: (1) community mobilization, (2) home, school, and retail environmental strategies, and (3) a school-based educational curriculum. See Johnson et al. (2007) for a complete description of all components and Gruenewald et al. (2009) for an assessment of the CPM.

The HES, which is the focus of this article, was designed to encourage parents of 5th to 7th graders to reduce availability of HLPs in the home by removing products from the home and by locking up and monitoring the supplies of products present in the home. Evidence to support the effectiveness of environmental strategies in reducing alcohol and other drug misuse has grown over the last few decades (Gruenewald, Holder, & Treno, 2003; Holder et al., 1999, 2000). However, no prior studies have investigated HES to reduce availability of HLPs.

The HES consisted of a series of two-hr Family Night training events in each study community over a 10-month period in 2006. Parents or guardians (hereafter, referred to as parents) of 5th to 7th graders were invited to attend the training events via letters from the schools followed by telephone calls from a Community Prevention Organizer. Additional Family Night trainings were implemented in a particular community if the planned Family Night event had a low turnout. All four communities had to have more than one training due to low initial turnout. The Family Night trainings were designed to increase parents' norms, specifically disapproval of their child's misuse of HLPs, as well as family rules to impact availability in the home environment. Prior research has shown the importance of norms in the form of parental disapproval (Collins et al., 2008), communication of norms to children (Kelly, Comello, & Hunn, 2002; Schinke, Fang, & Cole, 2008), and setting family rules (Oxford, Harachi, Catalano, & Abbott, 2001) as protective factors against substance use, including misuse of HLPs. To convey these messages about protective factors and train

parents on actions to reduce availability, the trainings used didactic materials about key concepts, exercises and parent discussions that included their home situations and experiences.

METHODS

Research Setting

Four Alaska communities (two northwestern and two southeastern) served as the setting and represented secondary hubs that are service centers for Alaska Native villages in their respective catchment areas. The communities participating in the study ranged in population from 3,000 to 9,000. Two had nonwhite (mostly Alaska Native) populations of between 30% and 35%, while the other two had nonwhite populations over 60%. The selection of these communities was based on two criteria. First, communities' ability to organize was assessed based on their successful participation in an earlier community project to reduce substance abuse that was funded by the Center for Substance Abuse Prevention. Second, a telephone survey of four or five key community representatives' perceptions of inhalant or prescription drug misuse as problems was conducted in each study community prior to the NIH grant application of the larger study. At least one of these two problems among youth was listed in the top three community problems noted in the survey. In addition, Saylor et al. (2007) found that over 17% of 5th to 7th graders in the four communities reported having used at least one type of HLP in their lifetime to get high.

Research Questions

From a conceptual view, the Home Environmental Strategy (HES) emphasized reducing youths' use of HLPs by reducing availability in the home, which can occur through removing HLPs from the home or by locking up and monitoring HLP. As discussed above, we implemented a home focused strategy that involved increasing parents' awareness, disapproval, rules, and specific actions that need to be taken in reducing availability. Although an examination of the proximal outcomes is important, this article focuses attention specifically on availability of HLPs in the home as a key mediator to reducing HLPs misuse among youth. The research questions of interest are:

Q-1: What is the extent of availability of HLPs in the home?

Q-2: Did the availability of HLPs in the home change over time?

Q-3: Were changes in availability in the home associated with exposure (direct and indirect) to the HES?

Research Design, Data Collection, and Sample

A prospective cohort design was employed in this study with two waves of data collected before and after implementing the HES. The sampling frame consisted of parents of 5th to 7th graders in the 11 public schools in the four study communities. Passive consent was used to obtain consent for participation. The school districts identified parents of 5th to 7th graders, and the parents were told that they might be contacted about taking a survey (unless they opted out).

Telephone interviews were conducted by trained interviewers at the Social and Economic Sciences Research Center at Washington State University using a CATI (computer-assisted telephone interview) system. The average interview length was 22 minutes at both Wave 1 (baseline) and Wave 2 (post-intervention) assessments. At Wave 1, all parents in the sampling frame received between 6 and 24 call attempts and interviews were completed with 402 of 736 parents (57% response rate) in the study's sampling frame. At Wave 2, the

sampling frame from Wave 1 (excluding the disconnected, language barrier, wrong number, and "don't call back" numbers) had between 18 and 30 call attempts. Interviews were completed with 371 of 592 parents (63% response rate). The final data file included 277 cases with both Wave 1 and Wave 2 responses, 125 cases with wave 1 responses only, and 94 cases with Wave 2 responses only. Some parents had Wave 2 data but not Wave 1 data, because parents were not in the sampling frame at the time (e.g., opted out at Wave 1). The large number of cases without observations at Wave 2 made it necessary to model attrition, to rule out attrition as an alternative explanation for putative results.

The majority of respondents were female (75% at Wave 1, 68% at Wave 2). At Wave 1, 36% were Alaska Natives (31% at Wave 2). A majority (62% at both waves) reported having at least some college education. Most of the sample (82% at Wave 1 and 87% at Wave 2) reported currently being engaged in work for pay. Two-thirds of the sample (68% at Wave 1 and 62% at Wave 2) reported their total household income as being over $50,000 per year.

Measures

Outcome—Because the types of HLPs we studied (inhalants, prescription and non-prescription drugs, and household products) are very different from one another, in our analyses we examined availability of each type of HLP separately as well as in aggregate. For aggregate measures, we used indices, which are appropriate for emergent variables that are content related, but not necessarily correlated (Bollen & Lennox, 1991).

We used the following outcome measures of HLP availability. First, HLPs Present in Home was measured by five dummy-coded variables to represent whether the parent reported each type of HLP (prescription drug, non-prescription drug, inhalant, and common household product) as present in the home ("1") or not present in the home ("0"), and whether all four HLP types were present ("1") or whether one or more of the four types was not present ("0"). Second, HLPs Locked Up was measured by five dummy-coded variables to denote whether the parent reported locking up each type of HLP, and whether the parent reported locking up at least one HLP type ("1") and "0" otherwise. Third, HLPs Monitored was measured by five dummy-coded variables to denote whether the parent reported monitoring the supplies of each type of HLP, and whether the parent reported monitoring supplies of at least one HLP type ("1") and "0" otherwise.

Intervention Exposure—Intervention exposure was measured in two ways based on respondent reports at Wave 2. First, a dummy-coded variable, direct intervention exposure was coded "1" if the respondent reported having participated in any of the Family Night events, and "0" otherwise. Second, to measure indirect intervention exposure, we computed a composite score from two survey items that asked whether the respondent had heard or read about the Family Night events and whether they knew anyone who had attended the Family Nights. The composite was coded as "2" if both occurred, "1" if the respondent had heard or read about the events, and "0" otherwise.

Individual and Household Characteristics—Individual and household characteristics were used as covariates to statistically control for these characteristics serving as potential alternative explanations for our results. They included gender (1=Female; 0=Male), Alaska Native (1=Yes; 0=No), education (did not graduate from high school, high school graduate, vocational or business school graduate, some college, college graduate, graduate school), working for pay (1=Yes; 0=No), and total household income ($25, 000 or less; $25,001 to $50,000; $50,001 to $75,000; $75,001 to $100,000; $100,001 to $125,000; $125,001 to $150,000; $150,001 to $200,000; $200,001 to $300,000; more than $300,000).

Analyses

Data validation was conducted to ensure that there were valid responses for every survey question and that there were no out-of-range values. Missing covariate data (i.e., all individual and household characteristics discussed in the measures section) were imputed using the Expectation Maximization (EM) algorithm, which employs maximum-likelihood estimation to ensure consistency between the variance-covariance matrix derived from the observed data and the imputed data (Dempster, Laird, & Rubin, 1977). In the EM model, covariates were treated as predictors and outcomes. The proportion of missing values was minimal for the covariates of education (.03%), Alaska Native status (.81%), gender (.40%), and employment (.00%), and it was below 10% for income (9.07%), which complements the result that there was no evidence to suggest that data were not missing completely at random using Little's test, $\chi^2(15)=13.40$, p=.57.

A Heckman two-step approach (Heckman, 1976; Heckman, 1979) was used to correct for potential selection biases due to attrition. In the first step, a probit regression model was run entering individual characteristics as predictors of attrition status. Second, model estimates were used to produce an Inverse Mill's Ratio (IMR), which represents the probability of attrition, given one's profile on the background characteristics. This IMR was included in all models as a statistical correction for attrition biases.

Descriptive analyses were conducted to answer question 1. Specifically, we examined the proportions of homes at Wave 1 in which parents reported HLPs Present in Home, HLPs Locked Up, and HLPs monitored. These analyses were conducted for each type of HLP and for the composite HLP measure.

Research questions 2 and 3 concerned (1) whether there were decreases over time (Wave 1 vs. Wave 2) in availability of HLPs as reported by parents (Q-2) and (2) whether these changes over time were associated with direct or indirect exposure to the intervention (Q-3). The procedures used to address question 2 are the same as those used to address question 3; however, intervention variables representing direct and indirect exposure are completely removed from the model for question 2. To avoid redundancy, we discuss only the analysis procedures used to address question 3. All analyses were performed using Hierarchical Non-Linear Modeling (HNLM) with a logit link function. HNLM was used to deal with multiple observations being nested within each participant (i.e., Wave 1 and Wave 2 repeated observations) using a first-order autocorrelated error structure. All models used a random intercept, which assumes that variability may arise among individuals due to nesting.

Our procedure used to answer question 3 regressed outcomes on the inverse Mill's ratio, an indicator of wave, an indicator of direct exposure, an indicator of indirect exposure, the interaction between wave and direct exposure, and the interaction between wave and indirect exposure. As the number of tests on all potential outcomes would represent a large number of tests, which would have resulted in alpha inflation, we followed a decision rule of interpreting only the results for specific types of HLPs when there was a significant result for the composite outcome variables (i.e., the result combined across multiple HLP types). This logic is similar to the logic of interpreting univariate tests in multivariate tests, such as MANOVA.

RESULTS

Extent of HLPs' Availability

Table 1 shows results describing the extent of availability in the home relating to research question 1. The percentage of the homes at Wave 1 in which parents reported HLPs being present, locked up, and monitored varied considerably. In 57% of the homes, parents

reported that all four types of HLPs were present at Wave 1. Parents in only 22% of the homes reported that they locked up any of the four types of HLPs. However, the results also showed that in 82% of the homes, parents reported that they monitored the supplies of one or more of the four types of HLPs.

Looking at the results for specific types of HLPs, in 90% of the homes, parents reported that common household products were present; prescription drugs were the type of HLP reported as present in the lowest percentage of homes (68%). In 20% of the homes, parents reported prescription drugs as being locked up, while in only 7% did parents report locking up non-prescription drugs, and in 3% parents reported locking up common household products. Prescription drugs were also the type of HLP reported as being monitored in the highest proportion of the homes at baseline (80%), followed by non-prescription drugs (74%). In more than 50% of the homes, parents reported that inhalants and common household products were being monitored.

Change in Availability of HLPs

Table 2 presents results of the analyses conducted on the composite outcomes to address whether availability to HLPs changed over time (i.e., research question 2). An examination of these results shows that there was a statistically significant change in one or more HLPs being not present in the home when comparing Wave 1 to Wave 2. More specifically, when considering the HLPs about which we asked, participants were half as likely to have them all in their home at Wave 2 relative to Wave 1 (odds ratio = .50). The changes in locking up HLPs and supplies of HLPs being monitored did not achieve a conventional level of significance.

Table 3 shows the results for the four types of HLPs. Statistically significant changes in HLPs present in the home were seen for three of the four types of HLPs (inhalants, prescription drugs, and non-prescription drugs). Specifically, participants were about half as likely to have inhalants and prescription drugs in the home at Wave 2 (odds ratios of .44 and .54), and parents were also less likely to have non-prescription drugs in the home at Wave 2 (odds ratio = .65). In addition, significant change was shown for locking up two types of HLPs (prescription and non-prescription drugs). Participants were between one and a half and two times as likely at Wave to report locking up prescription drugs (odds ratio = 1.56) and non-prescription drugs (odds ratio = 1.86).

Intervention Exposure Association with HLPs' Availability

Twelve percent (44 of 371) of the parents stated at Wave 2 that they had direct intervention exposure by being a participant in a Family Night event in their community. At Wave 2, 35% of the parents surveyed stated that they had some indirect intervention exposure (i.e., read or heard about the Family Nights / knew someone who attended a Family Night event).

Table 4 shows that change in HLPs in the home was marginally associated with direct intervention exposure. Of participants who had all of the types of HLPs in their home at Wave 1, only one-third had all of the HLPs in their home at Wave 2 (odds ratio=.33). However, the analysis also suggested that parents who participated in the Family Nights had an additional marginal decrease in having products in their home that was almost two times (or the inverse of the reported odds ratio = .56) as great as the decrease in the group not directly exposed to the intervention. There was no evidence to suggest that indirect intervention exposure was associated with HLPs' availability in the home.

DISCUSSION

Our results indicate that in over half of the homes in the four Alaskan communities parents reported that all four types of HLPs were present. More than 80% of parents reported that they monitored some products in the home, and more than 20% reported that they locked up some products. We found significant change from Wave 1 to Wave 2 in HLPs present in the home. In a subsequent analysis we found that this change in availability was driven by three of the four types not being present in the home: inhalants, prescription drugs, and non-prescription drugs. These Wave 1–2 results indicate that parents may have taken steps to remove potentially abusable prescription and non-prescription drugs and inhalants from their homes. We also found significant change over time for parents reporting locking up both prescription and non-prescription drugs. Given that availability of inhalants (Anderson & Loomis, 2003) and prescription drugs (Center on Addiction and Substance Abuse, 2005) has been found to be correlated with misuse of these products, these results are promising. Direct exposure to the Family Night events was found to be associated with the decrease in HLPs present in the home at Wave 2 relative to Wave 1. This positive result occurred even though only 12% of the parents of children in the 5^{th} – 7^{th} grades in the study communities participated in a Family Night. That is, those parents who participated in the Family Nights reported a decrease in HLPs present in the home that was nearly twice that of parents who did not participate. We could not rule out the possibility that adverse HLP related events in the community could have raised awareness and resulted in increased efforts by parents to reduce availability of HLPs in the home. However, we did confirm that none of the Community Prevention Organizers, who helped lead local community efforts, reported any serious adverse HLP related events during the evaluation period.

LESSONS LEARNED AND CONCLUSIONS

There were several lessons learned from this study of a home environmental strategy that are being addressed in a subsequent randomized controlled trial (RCT), which has been funded for five years. The RCT tests for the efficacy of multi-component environmental strategies (household, school, and retail outlet environmental strategies) to reduce HLPs among youth in rural Alaska (Johnson et al., 2012). This research includes 16 rural communities in Alaska that are matched and randomly assigned to an intervention group (8 communities) and a control group (8 communities). Two lessons relate to the intervention and two to the research.

One HES intervention lesson stems from the need for more proactive recruitment of parents to the Family Night events to increase direct exposure of parents to the intervention. In the in-progress RCT, a modification is that a booklet to engage and involve parents is disseminated to all parents of 5^{th} to 7^{th} graders, along with an invitation to the Family Nights. The booklet provides an introduction to the information to be covered in the Family Night. A phone call from a Community Prevention Organizer asks parents if they have received the booklet, if they have read the booklet and completed any of its exercises, and encourages them to attend the upcoming Family Night. We are also addressing this need by the inclusion of a second Family Night event in each community as part of the intervention design rather than conducting additional family events if the attendance is low in a particular community. Additional content has also been added on how parents can advocate for others in the community to reduce availability of HLPs in the home.

A second lesson concerns the need for proactive follow-up technical assistance to parents. In the in-progress RCT, two modifications to address this need are being implemented. Technical assistance is provided to parents following the Family Nights through follow-up telephone calls to ask parents about actions they have taken in the home to reduce

availability and to ask whether they need additional information resources or other assistance. In addition, a series of five reminder postcards are mailed to participants at regular intervals that contain short positive references to the project and actions covered in the Family Nights.

One research related lesson learn that has been incorporated in our in-progress RCT is to examine the change in family norms and rules, as well as their mediating effects of the HES intervention on availability. Further examination of these potential mechanisms of change can advance the understanding of how decreasing availability of HLPs can best be achieved. A second research related lesson is that it is important to examine cost effectiveness of parents taking actions to reduce availability of HLPs in the home, since the costs of taking actions can impact the potential for sustainability of actions. The in-progress RCT therefore includes the addition of a cost-effectiveness analysis to address this lesson.

In conclusion, the results of this study provide evidence that a there was a significant decrease in HLPs present in the home at Wave 2. There was also evidence that a significantly larger proportion of parents locked up prescription and non-prescription drugs at Wave 2 compared to Wave 1. Although the change in HLPs present in the home cannot be attributed to the intervention since there was no control group, the fact that direct exposure to intervention activities was associated with the change suggests that this intervention has potential for affecting availability. Moreover, the modifications mentioned above should increase this home environmental strategy's positive effects in the in-progress RCT.

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Table 1

Baseline (Wave 1) Percent of Homes by Availability Outcomes and Types of HLPs (N=402)

Availability by Type of HLP	Percent
HLPs Present in Home*	**57%**
Inhalants	88
Prescription Drugs	68
Non-Prescription Drugs	81
Common Household Products	90
HLPs Locked Up**	**22%**
Inhalants	12
Prescription Drugs	20
Non-Prescription Drugs	7
Common Household Products	3
HLPs Monitored**	**82%**
Inhalants	52
Prescription Drugs	80
Non-Prescription Drugs	74
Common Household Products	56

Notes:

* Composite variable represents parent report that all types of HLPs are present in the home.

** Composite variables represent parent report that at least one type of HLP is locked up or monitored.

Table 2

Wave 1 – Wave 2 Change in Availability Outcomes for HLPs (Composite Variable) Controlling for Selection Bias and Intraclass Correlation

	t		OR (95% CI)
HLPs Present in Home			
Intercept	−.80		.63(.20, 1.98)
Inv. Mill's Ratio	1.34		1.83(.76, 4.43)
Wave	−4.99**		.50(.38, .67)
Intraclass Correlation		.07	
HLPs Locked Up			
Intercept	2.58*		7.05 (1.60,31.13)
Inv. Mill's Ratio	−4.33**		.08 (.02,.24)
Wave	.72		1.12 (.82,1.53)
Intraclass Correlation		.20	
HLPs Monitored			
Intercept	5.01**		49.14 (10.70,225.78)
Inv. Mill's Ratio	−3.04**		.17 (.05,.53)
Wave	.26		1.04 (.75,1.45)
Intraclass Correlation		.22	

Note:

** p<.01

* p<.05

+ p<.10; df for level one tests range between 770 and 774 and df for level two tests range between 483 and 494.

Table 3

Wave 1 – Wave 2 Change in Availability Outcomes for Four Types of HLPs Controlling for Selection Bias and Intraclass Correlation.

	Inhalants		Prescription Drugs		Non-prescription Drugs		Household Products	
	t	OR (95% CI)	t	OR (95% CI)	t	OR (95% CI)	t	OR (95% CI)
HLPs Present in Home								
Intercept	.17	1.12(.30, 4.16)	.89	1.71(.52, 5.58)	.54	1.45(.37, 5.66)	.95	2.20(.43, 11.22)
Inv. Mill's Ratio	2.79**	4.38(1.55, 12.36)	.34	1.17(.47, 2.94)	1.65+	2.44(.85, 7.04)	1.80+	3.18(.90, 11.22)
Wave	−4.32**	.44(.308, 0.64)	−4.45**	.54(.41, 0.71)	−2.70**	.65(.47, 0.89)	−1.55	.70(.45, 1.10)
Intraclass Correlation	.07		.11		.16		.04	
HLPs Locked Up								
Intercept	1.15	3.11 (.45,21.52)	1.43	3.36 (.64,17.67)	1.82	7.95 (.85,74.23)	2.77**	100.35 (3.81,2641.32)
Inv. Mill's Ratio	−3.09**	.08 (.02,.41)	−3.14**	.13 (.04,.46)	−4.18**	.02 (.00,.13)	−4.67**	.00 (.00,.02)
Wave	−1.47	.68 (.41,1.14)	2.22*	1.56 (1.05,2.32)	2.40*	1.86 (1.12,3.08)	−1.73	.39 (.14,1.13)
Intraclass Correlation	.12		.18		.23		.29	
HLPs Monitored								
Intercept	3.56**	11.77 (3.02,45.83)	3.02**	14.53 (2.55,82.65)	4.29**	26.38 (5.89,118.09)	5.30**	44.41 (10.90,180.99)
Inv. Mill's Ratio	−3.44**	.16 (.06,.45)	−1.45	.37 (.10,1.42)	−2.88**	.18 (.06,.58)	−4.97**	.06 (.02,.19)
Wave	−1.10	.85 (.64,1.13)	.10	1.02 (.67,1.55)	−.52	.92 (.67,1.27)	.19	1.03 (.78,1.35)
Intraclass Correlation	.16		.19		.20		.19	

Note:

** $p<.01$

* $p<.05$

+ p<.10; df for level one tests range between 595 and 678 and df for level two tests range between 348 and 494.

Table 4

Wave 1 – Wave 2 Change in Availability Outcomes for HLPs (Composite Variable) and Association of Exposure with Change, Controlling for Selection Bias and Intraclass Correlation.

	t		OR (95% CI)
HLPs Present in Home			
Intercept	−.06		.97(.28, 3.32)
Inv. Mill's Ratio	1.07		1.64(.67, 4.02)
Wave	−4.10**		.33(.19, .56)
Direct Exp.	−.81		.76(.39, 1.47)
Indirect Exp.	2.19*		1.34(1.03, 1.75)
Direct Exp. X Wave	−1.88+		.56(.31, 1.03)
Indirect Exp. X Wave	.92		1.10(.90, 1.33)
Intraclass Correlation		.08	
HLPs Locked			
Intercept	2.30*		6.42(1.32, 31.35)
Inv. Mill's Ratio	−4.33**		.07(.02, .24)
Wave	.98		1.28(.78, 2.12)
Direct Exp.	.34		1.16(.50, 2.69)
Indirect Exp.	.06		1.01(.73, 1.39)
Direct Exp. X Wave	.83		1.31(.69, 2.50)
Indirect Exp. X Wave	−.57		.93(.72, 1.19)
Intraclass Correlation		.20	
HLPs Monitored			
Intercept	4.89**		52.19(10.67, 255.26)
Inv. Mill's Ratio	−3.20**		.15(.05, .48)
Wave	.12		1.04(.57, 1.90)
Direct Exp.	.69		1.39(.55, 3.52)
Indirect Exp.	.40		1.07(.76, 1.51)
Direct Exp. X Wave	.01		1.00(.48, 2.11)
Indirect Exp. X Wave	.05		1.01(.77, 1.31)
Intraclass Correlation		.22	

Note:

** p<.01

* p<.05; df for level one tests range between 738 and 766 and df for level two tests range between 480 and 492