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Effects of Socio-Structural Variables in the Theory of Planned Behavior: A Mediation Model in Multiple Samples and Behaviors

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Data Availability Statement

Study materials, data files, data analysis scripts, and analysis output presented in this manuscript can be found at https://osf.io/zhbq6.

Declaration of Conflicting Interests

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Abstract

Objective. Observed variation in health behavior may be attributable to socio-structural variables that represent inequality. We tested the hypothesis that variability related to socio-structural variables may be linked to variation in social cognition determinants of health behavior. A proposed model in which effects of socio-structural variables (age, education level, gender, income) on health behavior participation was mediated by social cognition constructs was tested. *Design*. Model effects were tested in correlational datasets (k=13) in different health behaviors, populations, and contexts. Samples included self-report measures of age, highest attained education level, gender, and net household income, and constructs from the theory of planned behavior (attitude, subjective norms, perceived behavioral control, intention). Ten samples provided follow-up self-reports of health behavior. *Results*. Path analyses supported sample-specific indirect effects of gender and age on health behavior with comparatively few income and education level effects. Meta-analytic structural equation modeling indicated consistent indirect and total effects of gender on intentions and health behavior through social cognition constructs, and a total effect of education level on behavior. *Conclusion*. Results provide support for the proposed mechanism by which socio-structural variables relate to health behavior. Replication in large representative samples and meta-analytic synthesis across multiple health behavior studies is warranted.

Keywords. Health behavior determinants; Social cognition theory; Health-related behavior; Intention; Attitude.

Introduction

Epidemiological research linking participation in a suite of health-related behaviors with reduced risk of non-communicable chronic diseases (Ford, Bergmann, Boeing, Li, & Capewell, 2012; Khaw et al., 2008) has compelled governments and health organizations to develop guidelines for the recommended levels of these behaviors to promote optimal health and prevent chronic disease (e.g., Byers et al., 2002), and advocate the development of behavioral interventions aimed at promoting participation in these behaviors at guideline levels in the population (e.g., Yang, Yang, Zhu, & Qiu, 2011). Central to the development of effective behavioral interventions is the identification of modifiable determinants of participation in health behavior, and the processes by which they relate to behavior (Hagger, Moyers, McAnally, & McKinley, 2020; Sheeran, Klein, & Rothman, 2017; Suls et al., 2020). Such determinants and processes then become targets for intervention using behavior change methods or techniques that form the content of behavioral interventions. The application of behavioral theories, such as social cognition and motivational theories, has proven useful as means to identify determinants and provide a priori predictions on how those determinants relate to health behaviors (Glanz & Bishop, 2010; Hagger, Cameron et al., 2020a; Hardcastle et al., 2017; Johnson & Acabchuk, 2018). Such theories focus on constructs such as beliefs, attitudes, norms, and intentions, and have utility because the constructs are considered eminently modifiable through behavior change methods like persuasion, social support, experience of success, provision of rationales, and positive feedback (Hagger, Cameron et al., 2020b). Formative research aimed at applying these theories to identity potential modifiable constructs as targets for change using behavior change methods is therefore considered pre-requisite to behavioral intervention development (Hagger, Cameron, et al., 2020b; Rothman, Klein, & Sheeran, 2020).

The theory of planned behavior (Ajzen, 1991) is pre-eminent among social cognition theories that have been applied to predict health behavior. The theory proposes that the most proximal determinant of a given target behavior is an individual's stated intention to do so. Intention is a motivational construct that reflects how much effort an individual is prepared to invest toward engaging in the behavior in future. Intention is a function of three belief based constructs: attitudes, positive or negative beliefs toward participating in the target behavior; subjective norms, beliefs that significant others endorse participation in the behavior; and perceived behavioral control, beliefs in personal capacity to engage in the behavior. Intentions are proposed to mediate effects of the belief-based constructs on behavior. The theory has been applied extensively across multiple health behaviors, contexts, and populations, and has accounted for substantive variance in behavior and its predictions have held in the presence of past behavior effects and effects of other constructs such as individual difference and personality (e.g., Brown et al, 2020; Chatzisarantis et al., 2004; Conner, Rodgers, & Murray, 2007; Conner & Abraham, 2001; Hagger, Chan et al., 2016; Hagger, Polet et al., 2018; Hamilton, van Dongen et al., 2020; McEachan et al., 2011; Rich et al., 2015). The attraction of the theory to researchers not only lies in its predictive power, elegant parsimony, and universal applicability, but also in its potential to guide intervention (Ajzen & Schmidt, 2020). Researchers and practitioners have demonstrated that the theory has been effective in guiding behavior change interventions by developing messages that target change in the component belief-based constructs (e.g., Hamilton & Johnson, 2020).

The theory of planned behavior and other similar social cognition theories have a heavy focus on individual determinants of health behavior, and applications of these theories have tended not to directly consider socio-structural variables as viable determinants in their own right (Schüz, 2017). This neglects a substantive body of research demonstrating that participation in

health behaviors is unevenly distributed within populations, with substantively lower participation among social groups and communities that have been traditionally underserved, economically disadvantaged, or discriminated against. Specifically, a raft of socio-structural variables such as income, education level, place of residence, culture, occupation, gender, religion, socioeconomic status, and social capital have been linked with health behavior participation (e.g., August & Sorkin, 2011; Kant & Graubard, 2007; O'Neill et al., 2014; Pampel, Krueger, & Denney, 2010; Petrovic et al., 2018; Stringhini et al., 2010). These inequalities in health behavior participation mirror research that has indicated disparities in health outcomes, such as elevated risk of chronic disease and life expectancies, in groups of lower socio-economic status and in those that have been traditionally underserved (Crook & Peters, 2008; Freedman, Grafova, & Rogowski, 2011; Mackenbach et al., 2008). Furthermore, differences in participation in health behaviors attributed to these variables is a possible reason for inequalities in health outcomes. For example, research has indicated that health behaviors serve to mediate effects of socio-structural variables that represent disadvantage such as low income and levels of education on health outcomes (e.g., Stringhini et al., 2010). That social cognition theories have not typically incorporated these variables as determinants of behavior alongside their core constructs places limits on their capacity to comprehensively explain observed variance in health behaviors across contexts, populations, and behaviors.

Examples of studies linking social structural variables that indicate inequalities with participation in health behaviors abound. For instance, research has demonstrated individuals from low income backgrounds have lower participation in health-related behaviors than individuals with higher incomes (August & Sorkin, 2011; Petrovic et al., 2018). Older individuals are less likely to engage in risky health behaviors such as smoking and risky patterns of alcohol consumption like binge drinking (Jamal et al., 2018; Kanny, Naimi, Liu, & Brewer, 2020), but

also have lower rates of participation in health behaviors such as physical activity (Doherty et al., 2017). Females tend to be less active than men, which accounts for a considerable proportion of the inequality observed in physical activity worldwide (Althoff et al., 2017). Knowledge of these disparities provides important information for governments and healthcare providers on, for example, where to invest resources to redress health disparities through behavior change. However, attempting to redress disparities is difficult given that many demographic variables are either not changeable or require unfeasible changes to social structures (O'Neill et al., 2014). A solution may lie in identifying modifiable intervention targets, for example, social cognition constructs, that may assist in explaining or damping the influence of socio-structural factors related to disparities on health behavior.

Research applying social cognition theories such as the theory of planned behavior to predict health behavior have often controlled for effects of socio-structural factors, but seldom explicitly accounted for the effects of these factors as determinants of health behaviors (Schüz, 2017). However, researchers have begun to formally consider the role of socio-structural variables within social cognition theories to produce integrated explanations of the determinants of health behavior and the processes involved (e.g., Godin et al., 2010; Li, Figg, & Schüz, 2019; Schüz, Brick, Wilding, & Conner, 2020; Schüz, Li, Hardinge, McEachan, & Conner, 2017). Researchers have proposed that the theories may provide mechanistic explanations for observed variability in health behavior participation attributable to socio-structural factors. Such approaches consider socio-structural variables as fundamental to the processes that determine health behavior participation and incorporate them as variables integral to health behavior theories. One proposed mechanism is that effects of socio-structural factors on health behavior participation may be mediated by the belief-based constructs specified in social cognition theories like the theory of planned behavior (Conner & Norman, 2015; Conner & Sparks, 2015;

Godin et al., 2010; McKinley, McAnally, Moyers, & Hagger, 2020). Such a model implies that socio-structural factors serve as a source of information on which individuals' beliefs about their future participation in health behaviors may be based. For example, individuals with lower incomes may see more barriers to participation in health behaviors like eating a healthy diet because the foods are more expensive or less accessible. Perceived behavioral control would, therefore, serve as a candidate mediator for the negative effect of income on health behaviors. Similarly, individuals who drop out of formal education early may not have had access to adequate information on the role of behavior in preventing long-term illness. Effects of education level on participation on preventive health behaviors may therefore be mediated by attitudes. Such a perspective highlights the potential role of beliefs from social cognition theories in providing an explanation for the effects of socio-structural factors on health behavior.

Previous studies provide illustrations of the role of theory-based constructs in mediating effects of socio-structural variables on health behavior. For example, Orbell et al. (2017) examined how social cognition constructs explained effects of ethnicity on uptake of colorectal cancer screening tests. Based on research showing lower uptake rates for colorectal screening among people from South Asian ethnic groups compared to non-Asians, Orbell et al. measured social cognition beliefs in a sample of individuals participating in a colorectal screening program including individuals from South Asian ethnic groups. Results revealed that effects of ethnicity on colorectal screening were fully mediated by lower self-efficacy and higher perceived psychological costs of the procedure. The researchers speculated that these effects reflected the increased distress and time demand of an abnormal screening result, which may involve seeking costly treatment and taking time off of work. Their lower confidence in their ability to take the test may have reflected the perceived disgust and embarrassment in the self-sampling screening procedure, particularly in group living conditions which offer limited privacy.

In a further example, Adams et al. (2013) examined effects of socio-economic status and functional health literacy on health-related behaviors (smoking, eating fruits and vegetables, physical activity, obesity status), and tested whether the effects of these variables on health behavior were mediated by cancer risk perceptions. Results revealed indirect effects of socio-economic status and health literacy on health behaviors through risk perceptions. The authors suggested that inadequate functional health literacy may be associated with a tendency to avoid health-related information, which may lead to reduced perceptions of risk and, subsequently, less participation in health-related behaviors. Analogously, individuals with adequate health literacy may be more aware of health risks, which may positively impact their uptake of lifestyle behaviors.

In another illustration, Godin et al. (2010) tested the multiple processes by which variables representing socio-structural influences (age, gender, education, income, and material and social deprivation) related to physical activity participation in a large representative sample of adults. A key test was the extent to which relationships between these variables and subsequent physical activity behavior were mediated by intentions and perceived behavioral control from the theory of planned behavior. Findings revealed both direct and indirect effects of education, income, and age on physical activity, mediated by the intention and perceived behavioral control constructs. However, no direct or indirect effects of gender and social deprivation on physical activity were found. These findings suggest that social cognition constructs accounted, at least in part, for effects of socio-structural variables on physical activity.

Taken together, these studies provide examples that illustrate the basic processes by which socio-structural variables relate to health behavior participation mediated by the psychological determinants of those behaviors derived from social cognition models. Next, we provide a generalized version of this basic process model based on the theory of planned

behavior, and how it provides a mechanistic explanation for effects of socio-structural variables on health behaviors.

A Basic Process Model

The proposed mediation of relations between socio-structural variables and health behaviors by social cognition factors from the theory of planned behavior can be summarized in the basic process model presented in Figure 1. In the model, socio-structural variables (age, gender, income, education level) are proposed as predictors of social cognition constructs (attitudes, subjective norms, perceived behavioral control). Consistent with the theory of planned behavior (Ajzen, 1991), the social cognition constructs including intentions are proposed as determinants of health behaviors. This implies *indirect* effects of the socio-cognitive variables on health behavior mediated by the social cognition constructs (see also Conner & Sparks, 2015). To the extent that these constructs fully explain relations between socio-structural variables and health behavior, then the indirect (mediated) effects should account entirely for the direct effect of socio-structural variables. This means that direct effects of socio-structural variables on health behavior would be trivial in size and no different from zero. Residual effects of the socio-structural variables on behavior may remain, however, if the social cognition constructs are not sufficient to fully account for socio-structural variable effects. It is important to note that the mediation of effects of structural and individual difference variables like socio-structural variables was suggested by Ajzen (1991) in his original conceptualization of the theory of planned behavior. However, these effects were identified as boundary conditions to test the sufficiency of the theory in explaining behavior, rather than outlining these effects as part of a formal explanatory process.

The importance of the process model is that it can identify potentially modifiable targets for behavioral interventions that may promote increased participation in health behaviors in

groups with certain socio-structural characteristics. Many socio-structural variables related to health disparities are fixed and unchangeable (e.g., age), or difficult to change (e.g., gender, education, income; O'Neill et al., 2014). Instead, it may be more feasible to target change in social cognition constructs that relate to engagement in health promoting behaviors through behavioral interventions. Applying the current model to behaviors and populations may provide important formative evidence on the extent to which social cognition constructs from the theory of planned behavior may explain, at least in part, observed socio-structural effects. Identification of these mediation effects may, therefore, provide important evidence of the potential for behavioral interventions targeting change in the mediating social cognition constructs to assist in changing behavior. The model may therefore play a role in providing a solution to observed disparities and deficits in health behavior related to socio-structural variables.

The Present Study

The purpose of the current research is to provide preliminary evidence for the proposed mediation effects of socio-structural factors on health behaviors mediated by social cognition constructs from the basic process model. We aimed to do this in currently-available datasets from a program of research on determinants of health behaviors in multiple behaviors, contexts, and populations. The focus is to provide in-principle support for the proposed effects which may pave the way for its application more broadly. Specifically, we examined the proposed mediation of four key socio-structural variables on health behavior mediated by measures of the social cognition constructs and intentions from the theory of planned behavior in 13 independent datasets comprising university student, community, and patient samples in a diverse range of health behaviors including binge, heavy episodic, and within safe limits alcohol drinking; dental flossing; physical activity; and parent-for-child dental, safety, and sun safety behaviors. Proposed model effects, particularly the proposed indirect effects of socio-structural variables on behavior

through social cognition constructs, were tested using path analytic models in each sample separately. We also synthesized effects among these datasets to examine whether the proposed pattern of effects in the proposed model held across pooled data from the samples using meta-analytic structural equation modeling. Such an analysis provides an evaluation whether, on average, the pattern of effects of the proposed model holds across the datasets, the variation in sample, behavior, and context characteristics notwithstanding. We expect the individual and synthesized data to provide preliminary support for the proposed effects and whether such a model is tenable. The research adopted near-identical measures of socio-structural variables and theory of planned behavior constructs, which minimizes variance attributable to lack of commonality in measures across studies and allows for direct comparisons.

In terms of specific hypotheses, we expect overall indirect effects of education level, income, age, and gender on health behavior participation mediated by attitude, subjective norm, perceived behavioral control, and intentions from the theory of planned behavior. We confine our predictions to overall indirect effects and do not make predictions in terms of the specific mediators and we expect these to vary across samples. However, we expect the overall pattern of effects to be replicated across samples consistent with the prediction of Ajzen (1991) and other social cognition theorists that these theories represent generalized processes that apply across contexts and populations, even though sizes of specific effects may vary.

Method

Design, Participants, and Procedure

The present study involved secondary analyses of a series of datasets (k = 13) each comprising an independent sample of participants who completed measures of key socio-structural variables (age, gender, household income, and highest education level), social cognition constructs from the theory of planned behavior, and measures of intention, behavior, or

both intention and behavior for different health behaviors. The samples were university student (k = 4), community (parents of young children, k = 5; older adults, k = 1; general adult, k = 1), and clinical (pregnant women, k = 1; familial hypercholesterolemia patients, k = 1) samples, and each focused on a separate health-related behavior (parent-for-child sun safety [two samples], toothbrushing, and swimming pool safety [two samples]; physical activity [three samples]; binge drinking, heavy episodic drinking, and drinking within safe limits; and dental flossing [two samples]). Data from all samples were collected in Australia. Samples were convenience samples of participants that were neither recruited at random nor systematically stratified by structural variables. Details of participant recruitment procedures, inclusion criteria, approval of research ethics committees, and previous studies using these datasets are provided in Appendix A (supplemental materials). In all samples, participants completed a questionnaire comprising self-report measures of study variables. All datasets were from studies that were correlational in design, with ten adopting a prospective design in which measures of the socio-structural and social cognitive variables from the theory of planned behavior were administered at an initial time point with a subsequent behavioral follow-up. Characteristics of current datasets including time lag to behavioral follow-up and previous research using the datasets are presented in Appendix B (supplemental materials). The remaining datasets adopted a cross-sectional design with socio-structural and social cognitive variables measured at a single time point.

Measures

Participants were presented with a brief introductory passage to each section of the questionnaire with included instructions on completing each set of items. The full set of questionnaire items are presented in Appendix C (supplementary materials).

Socio-structural variables. Studies adopted near-identical measures of socio-structural variables which permitted equivalence in measurement across datasets. Participants were asked to

report their age in years and report their gender as male or female. Participants were also asked to report their current annual household income in Australian dollars before tax with between five and seven response options. Response options were based on national data on average household income in Australia (see Appendix C for details; Australian Bureau of Statistics, 2015). For the purposes of the current study, we dichotomized this variable collapsing responses to the first two response options into a 'lower income' category and a 'medium/higher income' category. This meant that the low-income category was for people earning between AU$37,000 to AU$50,000 or lower, and we expected this to overall reflect individuals whose income fell substantially short of the national median of AU$80,704. Participants also self-reported their highest attained education level. Measures for the majority of the samples comprised four or five response options, referring to whether participants had completed junior/primary and/or secondary/high school education, a post-school vocational qualification (with the Australian 'TAFE' the most common certification) or trades certificate, or an undergraduate or postgraduate qualification. As with the income variable, a dichotomous education level variable was coded with 'lower education level' representing participants that completed their education up to the end of secondary/high school and 'middle/higher education level' representing participants completing a post-school or higher education qualifications.

Social cognition constructs. Participants completed standardized measures of intention, attitudes, subjective norms, and perceived behavioral control. Items were developed according to published guidelines (Ajzen, 2002). Consistent with the guidelines, each item was tailored to make reference to the target behavior and to correspond with the behavioral measure in terms of the target performing the behavior, the action to be performed, the context in which the behavior was to be performed, and the time frame over which the behavior was to be performed.

Behavior. Ten of the datasets included behavioral measures administered at a subsequent follow-up data collection occasion one or more weeks after administration of the measures of structural variables and social cognition constructs. In all cases, measures adopted multi-item measures of behavioral frequency compliant with Ajzen's (1991) correspondence rule.

Data analysis[1]

Predictions of the proposed process model were tested using path analysis in each individual sample implemented using the lavaan package in R (Rosseel, 2012). Fit of the model with data from the pooled correlation matrix from the datasets was tested using meta-analytic structural equation modeling using the METASEM package in R (Cheung, 2015). Model fit was evaluated using multiple goodness-of-fit criteria: the goodness-of-fit chi-square, the comparative fit index, the Tucker-Lewis index, the root mean square error of approximation (RMSEA) and its 95% confidence intervals, and the standardized root mean square of the residuals (SRMSR). Adequate fit was indicated by a non-significant goodness-of-fit chi-square, values for the CFI and TLI approaching or exceeding .950, RMSEA values equal to or less than .05 with narrow confidence intervals, and an SRMSR of .08 or less. Additional details of our data analyses including missing data analysis, and path analytic and meta-analytic structural equation modeling procedures are provided in Appendix D (supplemental materials).

Results

Sample characteristics and preliminary analyses

Socio-structural characteristics of the samples from each dataset and the total sample are summarized in Appendix E (supplemental materials) with attrition rates for across time for the datasets that included a behavioral follow up (k = 10). Overall, the sample was relatively young

[1]Data files, analysis scripts, and data analysis output files can be accessed online: https://osf.io/zhbq6.

(*M* age = 32.16, *SD* = 14.04), predominantly female (74.18% female), somewhat affluent (50.18% middle/high income), and relatively educated (63.73% middle/high education level). All samples were majority female (proportion female range = 53.41% to 100.00%). However, the average age of participants (*M* age range = 20.03 to 73.74), average education level (proportion in middle/high education category = 33.33 to 93.09), and average income (proportion in middle/high income category = 28.17 to 84.19) varied considerably across samples.

Descriptive statistics and reliability estimates for the social cognition constructs and behavior measures are presented in Appendix F. Reliability estimates approached or exceeded limits (>.700), with the exception of the inter-item correlation for the subjective norm construct in the dataset with the FH patients physical activity sample. Model-implied correlations among the socio-structural, social cognition, and behavior variables for the samples from each dataset are presented in Appendix G. Statistically significant correlations were observed among the social cognition constructs, intention and/or behavior were observed in all samples.

Path analytic models

Model fit

Model goodness of fit indices for the proposed models estimated in each individual sample from each dataset are presented Appendix H[2]. All models exhibited acceptable fit with the data as indicated by the multiple criteria adopted.

Model effects

[2]The models estimated in datasets 3 (FH patients physical activity sample), 8 (parents swimming pool safety behaviors – national sample), and 9 (parents swimming pool safety behaviors – regional sample) did not include a behavior measure and were therefore fully saturated, so no fit statistics could be computed.

Explained variance in intentions and behavior and parameter estimates for effects among constructs in the proposed models in each sample are presented in Appendices I and J, respectively (supplemental materials).

Theory of planned behavior. Overall, path analyses indicated that model effects conformed with the proposed pattern of effects among the theory of planned behavior constructs. Specifically, the effect of intentions on behavior was largely consistent across samples with medium-to-large effect sizes (β range = .279 to .681, *p*s < .006). We also found statistically significant estimates with small-to-medium effect sizes for the effects of attitude on intention in all but three of the samples (β range = .137 to .533, *p*s < .011). Attitude-intention effects in the student dental flossing (β = .062, *p* = .130), parent-for-child sun safety (sample 2; β = .133, *p* = .223), and parent-for-child toothbrushing (β = .091, *p* = .098) samples were not statistically significant and small in size. We also found statistically significant effects of perceived behavioral control on intention with small-to-medium effect sizes in all but one sample (β range = .099 to .527, *p*s < .049). The effect size for the perceived behavioral control-intention relationship in the university students drinking within safe limits was not statistically significant and was small in size (β = .020, *p* = .794). We found statistically significant effects with small-to-medium effect sizes of subjective norms on intentions for eight of the samples (β range = .169 to .473, *p*s < .037). The subjective norm-intention effect was not statistically significant and small in size for the FH patient physical activity (β = .106, *p* = .274), student heavy episodic drinking (β = .105, *p* = .095), older adults physical activity (β = .057, *p* = .286), and pregnant women physical activity (β = -.023, *p* = .644) samples. For the datasets that included a behavioral follow-up, we found statistically significant indirect effects for one or more of the attitude, subjective norm, and perceived behavioral control constructs on behavior mediated by intention.

Socio-structural variables

Next we focus on the proposed effects of social-structural variables on intentions and behavior mediated by the social cognition constructs from the theory of planned behavior. Our main focus is on the sums of indirect effects on intention and behavior for each variable through all of the social cognition constructs, and the total effects which includes the indirect effect and direct effect of the variable independent of the mediated effects. However, we also summarize trends in specific indirect effects, particularly the extent to which specific social cognition constructs (attitude, subjective norm, and perceived behavioral control) consistently mediate effects of the social-structural variables on behavior and intentions. The specific indirect, total indirect, total, and direct effects of these variables on behavior and intention for each dataset are summarized in Tables 1 and 2.

Gender. We found sums of indirect and total effects of gender on behavior in the university student dental flossing (indirect: $\beta = .126$, $p < .001$; total: $\beta = .120$, $p = .026$) and parent-for-child toothbrushing (indirect: $\beta = .082$, $p = .025$; total: $\beta = .205$, $p = .011$) samples, sums of indirect effects of gender on behavior in the student heavy episodic drinking sample ($\beta = -.065$, $p = .069$), and a substantive direct effect of gender on behavior in the parent-for-child toothbrushing sample, which fell marginally short of the conventional level for statistical significance ($\beta = .124$, $p = .081$). Focusing on the specific indirect effects (Table 1), we found one specific indirect effect of gender on behavior through intentions for the university student dental flossing sample. The fact that there were many more indirect and total effects of gender on behavior highlights the value of examining total indirect effects, because the sums of the very small, non-significant specific indirect effects of gender on behavior through intention and perceived behavioral control, and through the theory constructs (attitude, perceived behavioral control, and subjective norms) and intention, together amounted to statistically significant, non-trivial total indirect effects. We found sums of indirect effects and total effects of gender on

intention in the student heavy episodic drinking (indirect: β = -.085, *p* = .058; total: β = -.179, *p* = .010), parent-for-child pool safety national (indirect: β = .149, *p* < .001; total: β = .203, *p* < .001), and parent-for-child pool safety regional (indirect: β = .133, *p* < .001 total: β = .187, *p* < .001) samples. With respect to specific indirect effects (Table 2), perceived behavioral control was the most consistent mediator, although there were also effects through subjective norms and attitudes in the parent-for-child swimming pool safety national and regional samples. By comparison, there was only one direct effect of gender on intention, so the social cognition variables were generally responsible for mediating effects of this variable.

Age. We found sums of indirect effects and total effects of age on behavior in the student binge drinking (indirect: β = -.068, *p* = .013; total: β = -.158, *p* = .018), adult dental flossing (indirect: β = .107, *p* = .040; total: β = .305, *p* < .001), and parent for child sun safety (sample 2; indirect: β = -.117, *p* = .011; total: β = -.170, *p* = .053) samples. We found a sums of indirect effects of age on behavior in the older adults physical activity (β = -.123, *p* = .005) and the parent-for-child sun safety (sample 1; indirect: β = -.074, *p* = .008) samples, but no total effect because there was a positive direct effect which reduced the size of the total effect in each sample (older adults physical activity: β = .103, p = .109; parent for child sun safety [sample1]: β = -.047, *p* = .453). There was also a total effect of age on behavior in the parent for child toothbrushing sample (β = -.161, *p* = .030), but the effect was due to the direct effect (β = -.160, *p* = .020) because the indirect effect was small and not significant. We also found specific indirect effects (Table 1) of age on behavior through perceived behavioral control and intention in two samples, and one effect through intention only. Since we found total indirect effects of age on behavior in five samples, we concluded that the additive effects of a series of relatively small, non-significant indirect effects through the theory constructs and intention contributed to the non-trivial, statistically significant total indirect effects. There were also three direct effects of age on

behavior which, although not a sample-wide trend, indicated that the social cognition constructs may not always account for direct effects of age.

We found sums of indirect effects and total effects of age on intention in the student binge drinking sample (indirect: β = -.121, p = .020; total: β = -.159, p = .006), the older adults physical activity (indirect: β = -.160, p = .006; total: β = -.197, p = .006), the parent for child sun safety (sample 1; indirect: β = -.072, p = .048; total: β = -.119, p = .026), and the parent-for-child pool safety national (indirect: β = .149, p < .001; total: β = .203, p < .001) and regional (indirect: β = .133, p < .001; total: β = .187, p < .001) samples. There was also a total effect of age on intention in the adult dental flossing (β = .167, p = .015) and parent-for-child sun safety (sample 2; β = -.259, p = .010) samples, which was largely due to a statistically significant direct effect (adult dental flossing: β = .119, p = .014; parent-for-child sun safety [sample 2]: -.217, p = .043), while the indirect effect was not significant in both samples. Turning to specific indirect effects (Table 1), perceived behavioral control was the dominant mediator of effects of age on intention, and there were also direct age-intention effects in four of the samples.

Income. Although there were some specific indirect effects of income on behavior, such as the effect through intention in the student dental flossing sample (β = -.053, p = .036) or the effect through perceived behavioral control and intention (β = -.010, p = .045) for the parent-for-child sun safety (sample 1), there were no sums of indirect or total effects due to direct effects in the opposite direction. On the whole, the specific indirect effects (Table 1) tended to be through perceived behavioral control and intention, but, again, the effects did not amount to total indirect effects or total effects on behavior. We found a statistically significant sums of indirect effects of income on intention in the older adults physical activity sample (β = .108, p = .016) and the parent-for-child pool safety national sample (β = .074, p = .024), but no total effect due to direct effect of income on intention in the opposite direction (older adults physical activity: β = -.008, p

= .872; parent-for-child pool safety national: β = -.005, *p* = .831). In terms of specific indirect effects (Table 1), perceived behavioral control mediated effects of income on intention in two samples, while attitude and subjective norms mediated the effect in one sample. There was also a direct effect of income on intention in one of the samples.

Education. We found a statistically significant total indirect effects of education on behavior in the older adults physical activity (β = .098, *p* = .030) and student safe drinking (β = .073, *p* = .019) samples, but no total effects owing to negative direct effects (student safe drinking: β = -.020, *p* = .819; older adults physical activity: β = -.056, p = .389). There was one specific indirect effect of education on behavior through subjective norm and intention for the student safe drinking sample, consistent with the total indirect effect for this sample. There was also one direct effect of education on behavior for the parent-for-child sun safety behavior (sample 1). There were statistically significant sums of indirect effects and total effects of education level on intentions in the older adults physical activity (indirect: β = .132, *p* = .014; total: β = .159, *p* = .023), parent-for-child swimming pool safety national (indirect: β = -.063, *p* = .053; total: β = -.085, *p* = .033), and student safe drinking (indirect: β = .076, *p* = .034; total: β = .160, *p* = .017) samples. With respect to specific indirect effects on intentions (Table 1), perceived behavioral control and attitude mediated effects of education in two samples, while subjective norms was the mediator in one sample. There were no direct effects of education on intention in any of the samples.

Meta-analytic structural equation model

Parameter estimates of the meta-analytic structural equation model testing proposed model relations are presented in Table 3[3]. Results revealed non-zero small-to-medium sized

[3]Full parameter estimates including *p*-values are presented in Appendix K (supplemental materials).

effects of attitude (β = .321, $p < .001$), subjective norm (β = .181, $p < .001$), and perceived behavioral control (β = .296, $p < .001$) on intention, and intention on behavior (β = .493, $p < .001$), consistent with the theory of planned behavior. In addition, there were non-trivial non-zero indirect effects of attitude (β = .158, $p < .001$), subjective norm (β = .089, $p = .001$), and perceived behavioral control (β = .146, $p < .001$) through intention, consistent with the theory. Importantly, we found non-zero direct effects of education (β = .032, $p = .049$), income (β = .033, $p = .050$), and gender (β = .078, $p < .001$) on attitude, income (β = .044, $p = .005$) and gender (β = .057, $p = .043$) on subjective norm, and gender on perceived behavioral control (β = .088, $p = .004$). There were non-zero small indirect effects of gender on behavior through attitude and intention (β = .012, $p = .004$), and on intention through attitude (β = .025, $p = .003$). Similarly, there were small non-zero indirect effects of gender on behavior through perceived behavioral control and intention (β = .013, $p = .023$), and on intention through perceived behavioral control (β = .026, $p = .015$). Overall, there were total effects of gender on intention (β = .096, $p < .001$) and behavior (β = .058, $p = .022$), and no direct effects of gender on either intention (β = .034, $p = .183$) or behavior (β = .007, $p = .795$). There was also a total effect of education on behavior (β = .050, $p = .044$), even though the component direct and indirect effects fell short of conventional levels of statistical significance.

Discussion

The purpose of the present study was to provide a preliminary test of a process model in which relations between socio-structural variables (age, education, gender, income) and health-related behaviors were proposed to be mediated by social cognition constructs (attitudes, subjective norms, perceived behavioral control) and intentions from the theory of planned behavior. Rather than considering effects of socio-structural variables as mere controls for background factors (Schüz, 2017), the current research contributes to knowledge by focusing on

the mechanism by which variables relate to health behavior within social cognition theories. The research aimed to demonstrate how socio-structural variables are an important source of information on which individuals base, at least in part, their beliefs regarding their future engagement in health behavior. We tested the proposed model in a series of datasets from a program of research applying the theory of planned behavior to predict health-related behaviors across multiple populations and contexts, and systematically measured four socio-structural variables: age, highest attained education level, gender, and household income in conjunction with theory constructs and behavioral measures. Path analyses revealed adequate fit of the proposed model with the data in each dataset. Patterns of effects for the attitude, subjective norm, and perceived behavioral control constructs on intention, and on health behavior mediated by intention, were consistent across datasets, in accordance with predictions of the theory of planned behavior. With respect to the process model, results revealed indirect and total effects of age on health behavior in three datasets (student binge drinking, adult dental flossing, parent-for-child sun safety [sample 1]), and gender on behavior in two datasets (student dental flossing, parent-for-child toothbrushing). In contrast, there were no overall effects of income and education level on health behavior. Across the samples were also examples of indirect effects of socio-structural variables on intentions mediated by the social cognition constructs, but these were not translated to effects on health behavior. The meta-analytic structural equation model examining model effects across the datasets identified indirect effects of gender on intentions and health behavior, consistent with the proposed model. There was also a total effect of education on behavior, even though the component direct and indirect effects were non-significant.

The value the current research is that it enables tests of the extent to which socio-structural variables are salient when it comes to individuals' beliefs regarding future participation in health-related behaviors. The current study enabled us to test these predictions in multiple health

behaviors and across diverse populations and contexts. Results indicate that that the generalized prediction that social cognition constructs provide an explanation, at least in part, for the observed effects of socio-structural variables on health behavior holds in many of the datasets. These findings are consistent with previous research testing the indirect effects of these social structural variables in specific behaviors (e.g., Godin et al., 2010). However, it is also clear that there was considerable variability in which of the socio-structural variables were indirectly related to health behavior, and whether the indirect effect fully or only partly accounted for the direct effects of the variable on behavior. The lack of any discernible or systematic pattern of indirect effects across samples points highlights the imperative of researchers exploring the specific indirect effects of the socio-structural variables on the target behavior in the population and context of interest. Such formative research is important in order to inform whether interventions targeting ostensibly manipulable constructs from the theory of planned behavior will be effective in changing behavior and, importantly, resolving the observed differences in behavior represented by observed effects of the socio-structural variables (Hagger, Cameron, et al., 2020b; Rothman et al., 2020).

Specific examples from the current research may serve to illustrate this imperative. For instance, the positive indirect effect of gender on behavior in the university student dental flossing sample was largely directed through intentions, suggesting that variation in performance of these behaviors by gender may be attributable to variations in intentions. Although there were residual effects of gender on behavior, these data suggest that targeting change in determinants of intentions may be a strategy to partly mitigate gender differences in participation in these behaviors. Similarly, indirect and total effects of age on behavior in the student binge drinking, adult dental flossing, and parent-for-child sun safety (sample 2) samples suggest that observed effects of age are likely attributable to differences in the beliefs and intentions of individuals with

respect to performing these behaviors in future. One possible explanation is that older adults may be more likely to form adaptive and effective intentions due to more extensive previous experience. These findings signal that interventions targeting belief change may be essential to negate observed variation in behavior participation in these behavior due to age. Taken together, these illustrations suggest how the current data may contribute important information to interventionists seeking to change particular behaviors, particularly those known to vary according to socio-structural factors. Identifying potential modifiable targets for intervention that could assist in resolving differences attributable to socio-structural factors makes for more effective and efficient interventions for the behavior, population, and context of interest.

While variation in the patterns of effects of socio-structural variables in the proposed process highlights the importance of collecting sample-, context-, and behavior-specific data to inform appropriate intervention content, examination of model effects across samples using meta-analytic structural equation model also has value in providing general information on trends in effects. The value of meta-analysis is that it corrects datasets for variability attributable to sampling error, so, in the current sample, it provides an estimate of overall trends in model effects across samples and the true variability in the effects. Current findings indicate consistent indirect effects of gender on intentions and behavior mediated by the social cognition constructs from the theory of planned behavior. That these effects were pervasive across these samples with relatively low variability, suggests that the indirect effects of gender are sufficiently consistent and aligned in terms of size and direction to appear at the generalized level. It points to the likely importance of social cognition constructs in accounting for, at least in part, gender variation in health behavior participation across samples (Ajzen, 1991). The consistency in the positive direction of the effect also reveals that despite the variation in behavior, context, and population, females are more likely to participate in health-related behaviors than males, but also suggests

that targeting change in the determinants of intentions and behavior in behavior change interventions may assist in resolving those variations.

The total effect of education on behavior in the structural equation model is also noteworthy. This effect suggests that the social cognition constructs and intentions overall account for effects of education on behavior, despite relatively small, non-significant component indirect and direct effects. These findings suggest that effects of education on health behavior may be partly attributable to differences in individuals beliefs about health behaviors. This is consistent with research suggesting that knowledge about health behaviors and health literacy are associated with greater value placed on health behaviors and actual participation in health behavior (e.g., Adams et al., 2013; Hagger, Hardcastle et al., 2018; McKinley et al., 2020). However, education effects should be interpreted in light of the limitations of the measure of education level used in the present study. The measure made the distinction between those who had completed secondary/high school and those who had obtained a post-school qualification, which meant that most of the participants who were currently studying at University at the time of data collection likely self-selected as having only completed secondary/high school and were subsequently classified in the 'lower education level' category. A more fine-grained measure would likely provide greater precision in effects of education on behavior in the process model.

While the consistent effect of gender across samples in the meta-analytic structural equation model when accounting for sampling variability highlights the value of synthesizing data across samples, it is also important to note that despite statistically significant observed indirect effects of other socio-structural factors on behavior in individual samples, such effects are not observed in the meta-analysis across samples. This is unsurprising since indirect effects for many of the socio-structural variables on behavior varied in size and direction across samples,

highlighting the imperative of examining these effects within individual samples for the specific behavior and context of interest.

It is also worth noting trends in the specific indirect effects of the socio-structural variables in the current models, which included indirect effects on intention through the social cognition constructs from the theory of planned behavior (attitude, subjective norms, and perceived behavioral control) and serial indirect effects on behavior through these social cognitions and intention, or through perceived behavioral control. Overall, trends highlight an important role for perceived behavioral control, which was the most consistent mediator of effects of socio-structural variables on both intentions and behavior. This was particularly the case for the indirect effects of gender and age on intentions, and income on behavior. This pattern of effects seems to indicate that individuals from particular backgrounds, or with particular characteristics, are more empowered to participate in health behavior. Or, such individuals are more likely to avoid participating in health behaviors due to greater perceived barriers or lack of agency, perhaps due to limitations inherent in their environment. For example, positive effects of age on intentions to participate in health behavior in multiple samples may be due to older participants perceiving that they have greater personal agency in performing the behavior than younger participants. These effects may be attributable to older individuals believing that they have greater access to resources like healthcare, transport, or support networks to perform health behaviors. Positive effects of gender on intentions to participate in health behaviors through perceived behavioral control, suggests that males may be more likely to form stronger health intentions because they feel greater control over their behavior. This may indicate greater perceived resources and fewer barriers to engage in health behaviors among males, but may also reflect higher generalized self-efficacy beliefs in males (Luszczynska, Scholz, & Schwarzer, 2005). However, it must be stressed that these specific indirect effects numbered relatively few compared to the frequency of

total indirect effects, which indicates that small indirect effects of socio-structural variables on intentions and behavior were distributed across all three social cognition constructs, and intentions, to produce a total indirect effect. Effects of socio-structural variables may, therefore, have small but overall important multiple effects on individuals' beliefs, which link to their intentions and behavior.

Strengths, Limitations and Avenues for Future Research

The current study had a number of strengths: (a) application of a process model that enabled testing of the role of socio-structural variables in predicting health-related behavior within a prominent social cognition theory; (b) application of the model in a series of datasets that included consistent measures of socio-structural variables, social cognition constructs, and health behavior measures based on previous research with good reliability; (c) testing model predictions in a series of datasets from different behaviors, contexts, and populations; and (d) use of appropriate data analytic techniques that enabled testing of indirect effects in the proposed process model in each individual dataset as well as testing generalized trends in model effects and their variability in the synthesized dataset corrected for sampling error using meta-analysis.

However, several limitations should be acknowledged in light of which current findings should be interpreted. Primary among these is the highly selective nature of the samples of participants utilized in the current study. None of the samples of participants in the datasets were recruited using randomly-selected stratified sampling methods, and only two of the samples, the parent-for-child swimming pool safety behaviors national and regional samples, were recruited from databases that were largely representative of the target population. Selection bias is likely to have influenced profile of the reported demographic variables of the participants, and there was evidence for this in the characteristics of the sample – the samples were predominantly female, approximately half had middle-to-high income, and approximately two-thirds were of

middle/high education level. This means that the current data cannot be generalized to the general population. Furthermore, self-selection tendencies within samples may have been a reason for the relatively small effects of the socio-structural variables on behavior. Given that individuals from disadvantaged backgrounds are generally underrepresented in research, it is possible that only individuals from these backgrounds with an interest in the target behavior volunteered to participate, limiting the chances of finding population-level effects for these variables.

However, these limitations do not mean the current data lack value. Consistent with contentions of social cognition theories more broadly (Ajzen, 1991; Conner & Norman, 2015), the proposed process model is purported to specify mechanistic effects that are universal across behavior, population, and context. As a consequence, the current tests are fit-for-purpose in providing preliminary in-principle support for the tenability of the proposed model. However, considerable leeway exists to apply this model more broadly and test its proposed effects in large, randomly-selected populations. Such tests would be more informative with respect to the effects of the socio-demographic variables within the process model, particularly in samples that are more representative in terms of gender, income, and education level. In addition, synthesizing tests of effects of the proposed model in a meta-analysis of extant studies would also be of high value. One of the advantages of the current set of datasets is the constancy of measurement of the socio-structural, social cognition, and behavioral variables, which is seldom the case in the extant literature. This made data synthesis using meta-analysis relatively straightforward, while doing so in a meta-analysis of available studies from multiple samples and populations would be more challenging, particularly since correlations among socio-structural and social cognition variables are seldom reported, which makes the success of such an analysis highly dependent on securing ‘fugitive’ literature from study authors.

Limitations in measures used should also be acknowledged. Although measures of the socio-structural variables were identical or very similar across samples, and the criteria for classifying participants into categories based on these variables was consistently applied, these measures may have lacked nuance to detect effects. The education level variable, for example, distinguished between participants reporting having had a primary or secondary school education only (classified as 'lower educational level') and participants reporting having a post-school qualification (classified as 'middle/high education level'), which meant University students were likely to have been classified into the lower education category. This may have led to an overrepresentation of individuals of higher education level in the lower category, possibly reducing the likelihood of detecting education effects. A measure with greater fidelity was warranted. Similarly, variables such as income were categorical and, therefore, had to be dichotomized for analysis. An alternative would have been to prompt individuals to report exact income which could be used as a continuous moderator. So current findings should be interpreted in light of the limitations of the current measures of socio-structural variables.

Another limitation of the current research is the lack of inclusion of other socio-structural variables, particularly socio-economic status and ethnicity. Research has suggested that effects of these factors on health behavior may also be mediated by social cognition constructs consistent with the predictions of the process model tested here (Adams et al., 2013; Orbell et al., 2017). Research has provided preliminary tests of the mediation effects of constructs representing socio-economic status, specifically an index of social deprivation, in physical activity participation (Godin et al., 2010). However, systematic evaluation of these mediation effects across multiple samples is warranted.

A further limitation of the current study is that it tested only one potential mechanism by which socio-structural variables impacted health behavior. There is increasing research

suggesting that socio-structural variables, particularly indices of socio-economic status, may serve to moderate effects of social cognition constructs on health behavior (Schüz, 2017). Such research proposes an alternative mechanism by which constructs from social cognition theories relate to health behavior. Instead of indirect effects of socio-structural variables on health behavior via different levels of the social cognition constructs, effects of social cognition constructs on behavior may vary as a function of the levels of particular socio-structural variables. For example, lack of resources available to individuals through their socio-economic position may limit their capability to act on their intentions, in which case socio-economic status would be expected to moderate the intention-health behavior relationship. An increasing number of studies has tested this mechanism, particularly the extent to which socio-economic status moderates the intention-health behavior relationship, with varied success (Conner et al., 2013; Li et al., 2019; Schüz et al., 2020; Vasiljevic, Ng, Griffin, Sutton, & Marteau, 2016). Research that simultaneously accounts for both mediating and moderating effects is a potentially valuable avenue for future research.

We also acknowledge that we assumed that measures of the social cognition constructs were invariant across groups of individuals determined by socio-structural characteristics within the samples, and also across the samples. This is a common assumption in social cognition research, as theories like the theory of planned behavior assume that individuals process social information in identical ways and, therefore, the theories should represent universal or generalizable processes that underpin intentional behavior (for further discussion see, Chatzisarantis et al., 2008; Conner & Sparks, 2015; Hagger, Polet et al., 2018). In addition, research has suggested that measures of constructs from these theories exhibit factorial invariance across samples and groups, including those from different backgrounds (e.g., gender, age, ethnicity; Blanchard et al., 2008; Nigg, Maddock, & Lippke, 2009). These studies suggest that

such an assumption is not unreasonable. These findings notwithstanding, the assumption that individuals interpreted measures of the constructs in the current study in the same ways across groups defined by the social-structural variables should not be disregarded – there is potential that variation in interpretation of constructs may have interacted with effects of the socio-structural variables on behavior in the process model. This is an additional consideration to bear in mind when interpreting current findings.

It is also important to note that, all current datasets relied exclusively on self-report measures. The propensity for socially-desirable reporting and affirmation bias in participants' responses is, therefore, a relevant source of method error in the current study. While the adoption of valid and reliable measures developed consistent with published guidelines may obviate potential for this bias, replication of model effects adopting non-self-report measures, particularly of health behavior should be conducted for comparison. In addition, current research adopted correlational data, so directional and causal effects among process model variables is inferred from theory alone, not the data. Research adopting panel designs, experiments and intervention studies manipulating modifiable constructs in the model, and quasi-experimental designs capitalizing on naturally-occurring variations in, for example, socio-structural constructs should be considered in future studies to resolve this limitation.

Conclusion

The present study provides preliminary in-principle evidence in support of a process model in which effects of socio-structural variables on health behavior are mediated by social cognition constructs and intention from the theory of planned behavior. Results testing the model in individual samples revealed sample-specific indirect effects of gender, age, and education on health behavior mediated by social cognition constructs. Synthesizing results across samples enabled a test of consistent model effects and their true variability in this sample of studies while

controlling for sampling error. This supported indirect effects of gender on health behavior. Given the variability in model effects in each individual sample, current findings highlight the essentiality of identifying specific mediation effects within the sample and behavior of interest. Such sample-specific data may contribute to identifying targets for intervention that may assist in resolving variation in behavior attributable to socio-structural constructs. Synthesized results also provide information on the consistency of mediated effects of socio-structural constructs within the model across the samples, and present data suggest that few indirect effects were consistent across samples. While current data provide preliminary support for model indirect effects, generalizability is low given that samples were not recruited using random, stratified selection methods and represent a set of data from a single program of research. Replication in large representative samples and meta-analytically across multiple samples is advocated.

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* Denotes study included in meta-analysis

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Table 1

Summary of Specific Indirect, Total Indirect, and Total Effects of Socio-Structural Variables on Behavior from Path Analyses in Each Sample

Variable	Dataset	Effect		
		Specific indirect	Total indirect and total	Direct
Gender	1	Gender→Intention→Behavior	Gender→Behavior (total indir) Gender→Behavior (total)	
	5		Gender→Behavior (total indir)[a] -	
	13		Gender→Behavior (total indir) Gender→Behavior (total)	Gender→Behavior[a]
Age	2		Age→Behavior (total indir) - Age→Behavior (total) -	
	4		Age→Behavior (total indir) Age→Behavior (total)	Age→Behavior
	6	Age→PBC→Intention→Behavior -	Age→Behavior (total indir) -	
	7	Age→PBC→Intention→Behavior -	Age→Behavior (total indir) -	Age→Behavior
	12	Age→Intention→Behavior -	Age→Behavior (total indir) - Age→Behavior (total)[a] -	
	13		Age→Behavior (total) -	Age→Behavior
Income	1	Income→Intention→Behavior -		
	6	Income→PBC→Intention→Behavior		
	5	Income→PBC→Intention→Behavior		
	7	Income→PBC→Intention→Behavior -		
Education	6		Education→Behavior (total indir)	
	7			Education→Behavior
	11	Education→SN→Intention→Behavior	Education→Behavior (total indir)	

Note. [a]Parameter estimate for this effect falls outside conventional levels of statistical significance ($p < .05$) by a trivial margin. Negative effects are denoted with a minus sign (-), all others are positive.

Table 2

Summary of Specific Indirect, Total Indirect, and Total Effects of Socio-Structural Variables on Intention from Path Analyses in Each Sample

Variable	Dataset	Effect		
		Specific indirect	Total indirect and total	Direct
Gender	1			Gender→Intention
	5		Gender→Intention (total indir)[a] - Gender→Intention (total) -	
	8	Gender→Attitude→Intention Gender→SN→Intention Gender→PBC→Intention	Gender→Intention (total indir) Gender→Intention (total)	
	9	Gender→Attitude→Intention Gender→SN→Intention Gender→PBC→Intention	Gender→Intention (total indir) Gender→Intention (total)	
	13	Gender→PBC→Intention		
Age	2	Age→PBC→Intention -	Age→Intention (total indir) - Age→Intention (total) -	
	4		Age→Intention (total)	Age→Intention
	6	Age→PBC→Intention -	Age→Intention (total indir) - Age→Intention (total) -	
	7	Age→PBC→Intention -	Age→Intention (total indir) - Age→Intention (total) -	
	8	Age→SN→Intention Age→PBC→Intention	Age→Intention (total indir) Age→Intention (total)	Age→Intention
	9	Age→PBC→Intention	Age→Intention (total indir) Age→Intention (total)	Age→Intention
	12		Age→Intention (total) -	Age→Intention
Income	1			Income→Intention -
	6	Income→PBC→Intention	Income→Intention (total indir)	
	7	Income→PBC→Intention -		
	8	Income→Attitude→Intention Income→SN→Intention	Income→Intention (total indir)	
Education	6	Education→Attitude→Intention Education→PBC→Intention	Education→Intention (total indir) Education→Intention (total)	
	8	Education→PBC→Intention -	Education→Intention (total indir)[a] - Education→Intention (total) -	
	10	Education→Attitude→Intention[a]		
	11	Education→SN→Intention	Education→Intention (total indir) Education→Intention (total)	

Note. [a]Parameter estimate for this effect falls outside conventional levels of statistical significance ($p < .05$) by a trivial margin. Negative effects are denoted with a minus sign (-), all others are positive.

Table 3

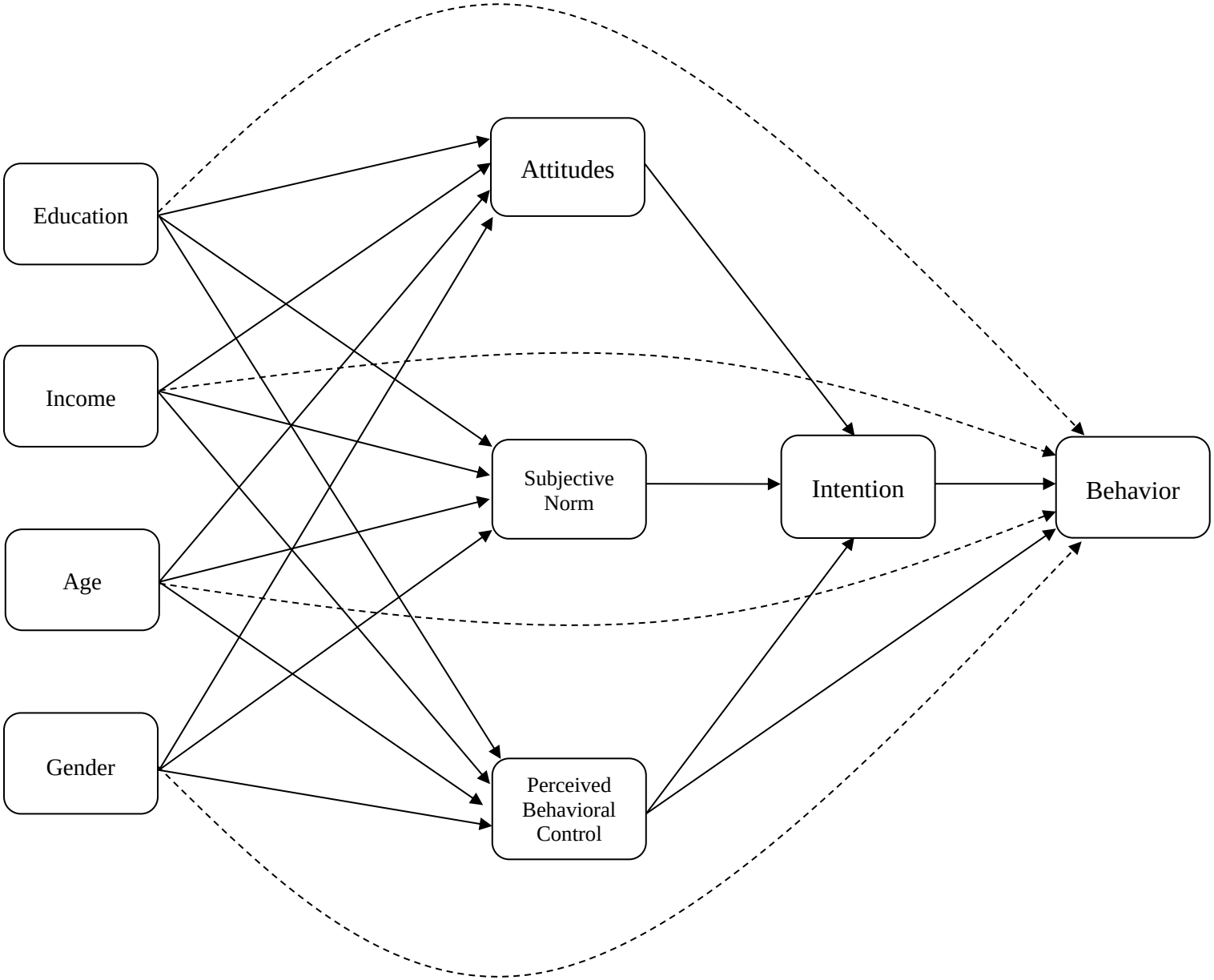
Standardized Path Coefficients, 95% Confidence Intervals, and Probability Estimates from Meta-Analytic Structural Equation Model Across All Datasets

Effect	β	CI_{95}		Effect	β	CI_{95}	
		LL	UL			LL	UL
Direct effects				Indirect effects (continued)			
Intention→Behavior	.493***	.386	.600	Income→SN→Intention→Behavior	.004*	.000	.008
PBC→Behavior	.045	-.087	.176	Income→PBC→Intention→Behavior	.004	-.002	.010
Education→Behavior	.040	-.007	.088	Income→Intention→Behavior	-.002	-.016	.012
Income→Behavior	-.007	-.042	.028	Income→PBC→Behavior	.001	-.003	.005
Age→Behavior	.001	-.076	.079	Age→Attitude→Intention→Behavior	.001	-.007	.008
Gender→Behavior	.007	-.045	.059	Age→SN→Intention→Behavior	.001	-.003	.005
Attitude→Intention	.321***	.203	.440	Age→PBC→Intention→Behavior	-.002	-.011	.006
SN→Intention	.181***	.081	.282	Age→Intention→Behavior	.001	-.029	.030
PBC→Intention	.296***	.166	.425	Age→PBC→Behavior	-.001	-.004	.003
Education→Intention	.004	-.025	.032	Gender→Attitude→Intention→Behavior	.012**	.004	.021
Income→Intention	-.004	-.033	.024	Gender→SN→Intention→Behavior	.005	-.001	.011
Age→Intention	.001	-.059	.062	Gender→PBC→Intention→Behavior	.013*	.002	.024
Gender→Intention	.034	-.016	.085	Gender→Intention→Behavior	.017	-.008	.042
Education→Attitude	.032*	.000	.064	Gender→PBC→Behavior	.004	-.008	.016
Income→Attitude	.033	.000	.065	Education→Attitude→Intention	.010	-.001	.021
Age→Attitude	.004	-.043	.051	Education→SN→Intention	.006	-.002	.013
Gender→Attitude	.078***	.035	.121	Education→PBC→Intention	.000	-.012	.013
Education→SN	.031	-.008	.070	Income→Attitude→Intention	.010	-.001	.022
Income→SN	.044**	.013	.076	Income→SN→Intention	.008*	.001	.015
Age→SN	.007	-.038	.052	Income→PBC→Intention	.008	-.004	.020
Gender→SN	.057*	.002	.113	Age→Attitude→Intention	.001	-.014	.016
Education→PBC	.001	-.041	.043	Age→SN→Intention	.001	-.007	.010
Income→PBC	.027	-.011	.066	Age→PBC→Intention	-.005	-.021	.011
Age→PBC	-.017	-.071	.037	Gender→Attitude→Intention	.025**	.009	.042
Gender→PBC	.088**	.029	.148	Gender→SN→Intention	.010	-.001	.022

Correlations			
Attitude↔SN	.413***	.323	.503
Attitude↔PBC	.388***	.315	.461
SN↔PBC	.383***	.277	.490
Age↔Gender	-.116***	-.162	-.069
Education↔Age	.203**	.087	.318
Income↔Age	.072	-.022	.166
Education↔Gender	-.047**	-.079	-.016
Income↔Gender	-.082**	-.131	-.033
Education↔Income	.091*	.010	.172
Indirect effects			
Attitude→Intention→Behavior	.158***	.094	.223
SN→Intention→Behavior	.089**	.039	.140
PBC→Intention→Behavior	.146***	.067	.224
Education→Attitude→Intention→Behavior	.005	.000	.011
Education→SN→Intention→Behavior	.003	-.001	.007
Education→PBC→Intention→Behavior	.000	-.006	.006
Education→Intention→Behavior	.002	-.012	.016
Education→PBC→Behavior	.000	-.002	.002
Income→Attitude→Intention→Behavior	.005	.000	.011
Gender→PBC→Intention	.026*	.005	.047
Sums of indirect effects			
Education→Behavior	.010	-.007	.027
Income→Behavior	.012	-.005	.030
Age→Behavior	-.001	-.032	.030
Gender→Behavior	.051***	.025	.078
Education→Intention	.016	-.006	.039
Income→Intention	.027*	.005	.048
Age→Intention	-.002	-.030	.025
Gender→Intention	.062***	.032	.091
Total effects			
PBC→Behavior	.191***	.086	.295
Education→Behavior	.050*	.001	.099
Income→Behavior	.005	-.031	.042
Age→Behavior	.000	-.074	.074
Gender→Behavior	.058*	.008	.108
Education→Intention	.020	-.013	.053
Income→Intention	.022	-.012	.056
Age→Intention	-.001	-.062	.060
Gender→Intention	.096***	.046	.146

Note. β = Standardized path coefficient; CI_{95} = 95% confidence interval of path coefficient; LL = Lower limit of the CI_{95} of path coefficient; UL = Upper limit of the CI_{95} of path coefficient; SN = Subjective norms; PBC = Perceived behavioral control.
* $p < .05$ ** $p < .01$ *** $p < .001$

Figure 1. Basic process model illustrating indirect effects of socio-structural variables on health behavior mediated by social cognition constructs and intentions from the theory of planned behavior. Direct effects of socio-structural variables on intention omitted for clarity.



Appendix A

Details of Participant Recruitment Procedures for the Samples in Each Dataset Used in the Current Study

Dataset 1 (Student Dental Flossing Sample)

Participants were university students recruited from a major university in Queensland, Australia. Participants were recruited via three methods: face-to-face at the university, online through email and social media (i.e. Facebook), and posters advertising the study displayed in common areas at the university. A longitudinal design with three waves of data collection, each spaced one week apart, was adopted. Only data from the second follow-up were used in the present analysis and so it was treated as a prospective study. Participants (N = 629) completed a baseline paper-based questionnaire at an initial point in time. Three participants were removed due to incomplete data on all theory of planned behavior measures, making a final sample at Time 1 of N = 626 in the current study. Two weeks later, at the final follow-up, participants (n = 254; attrition rate = 59.62%) completed a behavioral follow-up survey over the phone. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were offered the opportunity to enter a prize draw to win one of four AU$25 gift voucher or receive course credit if they were eligible. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. No previous manuscripts have been published using these data. Recruitment procedures and methods are similar to those adopted in a previous study (Hamilton, Bonham, Bishara, Kroon, & Schwarzer, 2017).

Dataset 2 (Student Binge Drinking Sample)

Participants were first-year undergraduate students recruited from a major university in Queensland, Australia who reported having previously participated in binge drinking and were

not currently pregnant. Participants (N = 321) completed an online questionnaire at Time 1. Six weeks later, at Time 2, participants (n = 177; attrition rate = 44.86%) completed a behavioral follow-up survey online. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were offered the opportunity to enter a prize draw to win one of three movie vouchers or receive course credit if they were eligible. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. Full details of participant recruitment and characteristics are provided elsewhere (Brown, Hagger, & Hamilton, 2020).

Dataset 3 (Familial Hypercholesterolemia Patient Physical Activity Sample)

Participants were patients (N = 110) with familial hypercholesterolemia (FH) verified by a genetic test recruited from a lipid disorders clinic at Royal Perth Hospital (RPH) as part of the Familial Hypercholesterolemia Western Australia (FHWA) program. Patients were referred to the clinic by their family physician and other specialists as a result of abnormally high cholesterol levels. Participants were recruited from a pool of 415 patients matching a priori inclusion criteria: aged over 18 years, living in metropolitan Perth, and had received a prior diagnosis for FH from a genetic test. Eligible patients were either recruited by the clinic consultant during a routine treatment appointment and given the opportunity to complete the study questionnaire in the clinic itself or take it home and return it via mail in a pre-paid envelope, or invited to participate by letter from the clinic consultant with a questionnaire to be returned via pre-paid envelope. Participants were required to tick a box on the questionnaire indicating that they had read the study information and consented to participate in the study. The study was approved by the Curtin University and RPH Human Research Ethics Committees prior to participant recruitment and data collection. Questionnaires were distributed to participants (N = 262) based on their

clinic attendance and 110 completed questionnaires were returned representing a response rate of 52.67%. Full details of participant recruitment and characteristics are provided elsewhere (Hagger, Hardcastle, Hingley, Strickland, Pang, & Watts, 2016; Hagger et al., 2019).

Dataset 4 (Adult Dental Flossing Sample)

Participants were adult members of the Australian public recruited online through social media and university broadcast emails. Participants (N = 272) completed an online questionnaire at Time 1. Six weeks later, at Time 2, participants (n = 177; 30.04%) completed a behavioral follow-up survey online. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were offered the opportunity to enter a prize draw to win one of three movie vouchers. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. No previous manuscripts have been published using these data. Full details of participant recruitment and characteristics are provided elsewhere (Brown, Hagger, & Hamilton, 2020).

Dataset 5 (Student Heavy Episodic Drinking Sample)

Participants were university students aged between 18 and 25 years recruited from a major university in Queensland, Australia using a combination of face-to-face and online methods. Face-to-face recruitment involved direct approach by a member of the research team, with the potential participant being given a flyer containing the study URL. Online recruitment included notices sent in broadcast emails to all students at the university, notices posted on Facebook, and a notice posted on the school subject/participant pool. Participants (N = 204) completed a baseline online questionnaire in the lab at Time 1. Four weeks later, at Time 2, participants (n = 161; attrition rate = 21.08%) completed a behavioral follow-up survey online or over the phone. An information sheet outlining the details of the study was provided to all

participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were offered the opportunity to enter a prize draw to win one of four AU$25 gift voucher or receive course credit if they were eligible. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. Full details of participant recruitment and characteristics are provided elsewhere (Hamilton, Gibbs, Keech, & Hagger, 2020). The final sample in the latter published study (N = 121) was smaller than the final sample used in the present analysis because the research included an implicit association test for which there were fewer cases available for analysis.

Dataset 6 (Older Adults' Physical Activity Sample)

Participants were older adults aged 65 years and older, who resided independently in a community-dwelling, and were able to engage in physical activity of at least moderate intensity. Participants were recruited through a variety of methods including advertisements in local community newsletters, face-to-face presentations at community events, and word of mouth. Participants (N = 213) completed an online or paper-based questionnaire at Time 1. Two weeks later, at Time 2, participants (n = 165; attrition rate = 22.54%) completed a behavioral follow-up survey over the phone. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were offered the opportunity to enter a prize draw to win one of five AU$20 gift vouchers. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. Full details of participant recruitment and characteristics are provided elsewhere (Arnautovska, Fleig, O'Callaghan, & Hamilton, 2019).

Dataset 7 (Parent-for-Child Sun Safety Behaviors Sample 1)

Participants were residents of Queensland, Australia and comprised parents who had at least one child aged between 2 and 5 years who usually resided in the same household as the parent. Parents were independent, with only one partner from each couple completing the questionnaire. Participants were recruited via online advertising (e.g., online parenting forums such as “BubHub” and “Raising Children Network”, social media such as “Facebook”), face-to-face (e.g., dance schools, shopping centres), and through schools and childcare facilities. Participants (N = 373) completed an online questionnaire at Time 1. Two weeks later, at Time 2, participants (n = 273; attrition rate = 26.81%) completed a behavioral follow-up survey online. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were offered the opportunity to enter a prize draw to win one of three double pass movie vouchers. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. Full details of participant recruitment and characteristics are provided elsewhere (Hamilton, Kirkpatrick, Rebar, & Hagger, 2017).

Dataset 8 (Parent-for-Child Swim Safety Behaviors National Sample)

Participants (N = 509) were Australian (New South Wales/Australian Capital Territory = 30.5%, Victoria = 24.2%, Queensland = 24.2%, Western Australia = 10.2%, Tasmania = 3.1%, Northern Territory = 0.2%) parents and carers of young children aged 0-4 years. Participants were recruited through Taverner Research, an Australian research panel company, and represented key demographic characteristics relatively proportional to the Australian population. A cross-sectional correlational design was used with self-report measures administered concurrently in a single survey administered using the Qualtrics™ online survey tool. An information sheet outlining the details of the study was provided to all participants and informed

consent was assumed by completion of the survey. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. Full details of participant recruitment and characteristics are provided elsewhere (Hamilton, Peden, Smith, & Hagger, 2019).

Dataset 9 (Parent-for-Child Swim Safety Behaviors Regional Sample)

Participants (N = 528) were parents and carers of young children aged 0 to 4 years residing in New South Wales, Australia. Participants were recruited through Taverner Research, an Australian research panel company, and represented key demographic characteristics relatively proportional to the Australian population. A cross-sectional correlational design was used with self-report measures administered concurrently in a single survey administered using the Qualtrics™ online survey tool. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. No previous manuscripts have been published using these data.

Dataset 10 (Pregnant Women Physical Activity Sample)

Participants were pregnant women aged 18 years and older and recruited in Australia, with the majority residing in the states of Queensland and New South Wales (n = 171, 66%). Women were eligible to participate if they had not been diagnosed with a medical condition preventing them from engaging in physical activity in the antenatal period. Participants were recruited via face-to-face contact at mother/baby groups and general practice surgeries, along with advertisements at antenatal classes, childcare centers, and on social media. Participants (N = 207) completed an online or paper-based questionnaire at Time 1. One week later, at Time 2, participants (n = 117; attrition rate = 43.48%) completed a behavioral follow-up survey online or

over the phone. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participant, individuals were offered the opportunity to enter a prize draw to win one of three double pass movie vouchers (each valued at AU$50). The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. Full details of participant recruitment and characteristics are provided elsewhere (Hamilton, Fleig, Henderson, & Hagger, 2019).

Dataset 11 (Student Alcohol Consumption Safe Limits Sample)

Participants were university students aged between 18 and 25 years recruited from a major university in Queensland, Australia using a combination of face-to-face and online methods. Participants (N = 267) completed a baseline paper-based or online questionnaire at Time 1. Four weeks later participants (n = 166; attrition rate = 37.83%) completed a behavioral follow-up survey online or over the phone. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were offered the opportunity to enter a prize draw to win one of four AU$25 gift voucher or receive course credit if they were eligible. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. No previous manuscripts have been published using these data.

Dataset 12 (Parent-for-Child Sun Safety Behaviors Sample 2)

Participants were parents with at least one child aged between 2 and 5 years who usually resided in the same household as the parent. Parents were independent, with only one partner from each couple completing the questionnaire. Participants were recruited via online advertising (e.g., social media websites such as “Facebook”) and face-to-face (e.g., swim schools). Participants (N = 192) completed an online questionnaire at Time 1. Six weeks later, at Time 2,

participants (n = 100; attrition rate = 47.92) completed a behavioral follow-up survey online. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were offered the opportunity to enter a prize draw to win one of three movie vouchers. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. Full details of participant recruitment and characteristics are provided elsewhere (Brown, Hagger, & Hamilton, 2020).

Dataset 13 (Parent-for-Child Tooth Brushing Sample)

Participants were parents with at least one child aged between 2 and 5 years who usually resided in the same household as the parent. Parents were independent, with only one partner from each couple completing the questionnaire. Participants were recruited face-to-face at locations in the greater Brisbane area, Australia area where parents congregate (e.g., swim schools, sporting clubs). The study adopted a longitudinal design with three waves of data collection, each spaced one week apart. Only data from the second follow-up were used in the present analysis and so it was treated as a prospective study. Participants (N = 281) completed a paper-based questionnaire at an initial time in point. At the final follow-up, participants (n = 219; attrition rate = 22.06%) completed a behavioral follow-up survey online or over the phone. An information sheet outlining the details of the study was provided to all participants and informed consent was assumed by completion of the survey. As an incentive to participate, individuals were given a thank you package that included a children's toothbrush, sample toothpaste, and information on child tooth brushing procedures. The study was approved by the Griffith University Human Research Ethics Committees prior to participant recruitment and data collection. No previous manuscripts have been published using these data. Recruitment

procedures and methods are similar to those adopted in a previous study (Hamilton, Cornish, Kirkpartick, Kroon, & Schwarzer, 2018).

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Appendix B

Characteristics of Current Datasets and Previously Published Studies Research Using the Datasets

Dataset	Sample	Behavior	Design	Time lag (weeks)	Previous Studies Using Dataset
1	University Students	Dental flossing	Prospective	2 weeks	No previous manuscripts have been published using these data.
2	University Students	Binge drinking	Prospective	6 weeks	Brown, D. J., Hagger, M. S., & Hamilton, K. (2020). The mediating role of reasoned-action and automatic processes from past-to-future behavior. *Social Science & Medicine*. https://doi.org/10.31234/osf.io/qrm5b
3	FH Patients	Physical activity	Cross-sectional	–	Hagger, M. S., Hardcastle, S. J., Hingley, C., Strickland, E., Pang, J., & Watts, G. F. (2016). Predicting self-management behaviors in familial hypercholesterolemia using an integrated theoretical model: The impact of beliefs about illnesses and beliefs about behaviors. *International Journal of Behavioral Medicine, 23*, 282-294. https://doi.org/10.1007/s12529-015-9531-x Hagger, M. S., Hamilton, K., Hardcastle, S. J., Hu, M., Kwok, S., Lin, J., Nawawi, H. M., Pang, J., Santos, R. D., Soran, H., Su, T.-C., Tomlinson, B., & Watts, G. F. (2019). Predicting intention to participate in self-management behaviors in patients with familial hypercholesterolemia: A cross-national study. *Social Science & Medicine, 242*, 112591. https://doi.org/10.1016/j.socscimed.2019.112591
4	Adults	Dental flossing	Prospective	6 weeks	Brown, D. J., Hagger, M. S., & Hamilton, K. (2020). The mediating role of reasoned-action and automatic processes from past-to-future behavior. *Social Science & Medicine*. https://doi.org/10.31234/osf.io/qrm5b
5	University students	Heavy episodic drinking	Prospective	4 weeks	Hamilton, K., Gibbs, I., Keech, J. J., & Hagger, M. S. (2020). Reasoned and implicit processes in heavy episodic drinking: An integrated dual process model. *British Journal of Health Psychology, 25*, 189-209. https://doi.org/10.1111/BJHP.12401
6	Older adults	Physical activity	Prospective	2 weeks	Arnautovska, U., Fleig, L., O'Callaghan, F., & Hamilton, K. (2019). Older adults' physical activity: The integration of autonomous motivation and theory of planned behaviour constructs. *Australian Psychologist, 54*, 46-54. https://doi.org/10.1111/ap.12346.
7	Parents	Sun safety behaviors for children (sample 1)	Prospective	2 weeks	Hamilton, K., Kirkpatrick, A., Rebar, A., & Hagger, M.S. (2017). Child sun safety: application of an Integrated Behavior Change model. *Health Psychology, 36*, 916-926. https://doi.org/10.1037/hea0000533.
8	Parents (National)	Swimming pool safety behaviors for children	Cross-sectional	–	Hamilton, K., Peden, A. E., Smith, S., & Hagger, M. S. (2019). Predicting pool safety habits and intentions of Australian parents and carers for their young children. *Journal of Safety Research, 71*, 285-294. https://doi.org/10.1016/j.jsr.2019.09.006
9	Parents (Regional)	Swimming pool safety behaviors for children	Cross-sectional	–	No previous manuscripts have been published using these data.

10	Pregnant women	Physical activity	Prospective	1 week	Hamilton, K., Fleig, L., Henderson, J., & Hagger, M. S. (2019). Being active in pregnancy: theory-based predictors of physical activity among pregnant women. *Women & Health, 9*, 213-228. https://doi.org/10.1080/03630242.2018.1452835
11	University students	Drinking alcohol within safe limits	Prospective	4 weeks	No previous manuscripts have been published using these data.
12	Parents	Sun safety behaviors for children (sample 2)	Prospective	6 weeks	Brown, D. J., Hagger, M. S., & Hamilton, K. (2020). The mediating role of reasoned-action and automatic processes from past-to-future behavior. *Social Science & Medicine*. https://doi.org/10.31234/osf.io/qrm5b
13	Parents	Tooth brushing for children	Prospective	2 weeks	No previous manuscripts have been published using these data.

Appendix C

Items and Response Scales for Study Variables

Dataset	Sample	Behavior	Variable	Item(s)	Scale
1	University students	Dental flossing	Attitude	Flossing my teeth on a daily basis would be…?	1 = unpleasant, 7 = pleasant 1 = bad, 7 = good 1 = worthless, 7 = valuable
			Subjective norm	In regards to flossing your teeth on a daily basis, do you agree that… Those people who are important to me would want me to floss? Most people who are important to me would approve of me flossing?	1 = strongly disagree, 7 = strongly agree
			Perceived behavioral control	In regards to flossing your teeth on a daily basis, do you agree that… It is mostly up to me whether I floss? I have complete control over whether I floss? It would be easy for me to floss? I am confident that I could floss?	1 = strongly disagree, 7 = strongly agree
			Intention	In regards to flossing your teeth on a daily basis, do you agree that… It is likely that I will floss? I intend to floss? I plan to floss?	1 = strongly disagree, 7 = strongly agree
			Behavior	In the last week, how often did you floss? In the last week, to what extent did you floss?	1 = never; 7; very often 1 = never; 7 = to a large extent
			Income	What is your annual household taxable income range?	1= “Zero to AU$18,200”, 2 = “AU$18,201 to AU$37,000”, 3 = “AU$37,001 to AU$80,000”, 4 = “AU$80,001 to AU$180,000”, 5 = “greater than AU$180,001”
			Education	What is your highest educational achievement?	1 = “Junior school”, 2 = “Senior school”, 3 = “TAFE Certificate/Diploma”, 4 = “Undergraduate degree”, 5 = “Postgraduate degree”
2	University students	Binge drinking	Attitude	For me to binge drink in the next six weeks would be…	1 = bad, 7 = good 1 = unpleasant, 7 = pleasant 1 = worthless, 7 = valuable
			Subjective norm	In regards to binge drinking in the next six weeks, do you agree that… Those people who are important to me would want me to binge drink? Most people who are important to me would approve of me binge drinking? Most people who are important to me think I should binge drink?	1 = strongly disagree, 7 = strongly agree

			Perceived behavioral control	In regards to binge drinking in the next six weeks, do you agree that… I have complete control over whether I binge drink? I am confident that I could binge drink? It is mostly up to me whether I binge drink? It would be easy for me to binge drink?	1 = strongly disagree, 7 = strongly agree
			Intention	In regards to binge drinking in the next six weeks, do you agree that… It is likely I will binge drink? I intend to binge drink? I expect to binge drink?	1 = strongly disagree, 7 = strongly agree
			Behavior	Think about the past 6 weeks. In general, how often did you binge drink? Think about the past 6 weeks. In general, to what extent did you binge drink?	1 = never, 7 = always 1 = never, 7 = a large extent
			Income	What is your annual household taxable income range?	1= "Zero to AU$18,200", 2 = "AU$18,201 to AU$37,000", 3 = "AU$37,001 to AU$80,000", 4 = "AU$80,001 to AU$180,000", 5 = "greater than AU$180,001"
			Education	What is your highest educational achievement?	1= "Completed junior/senior school", 2 = "TAFE Certificate/Diploma", 3 = "Undergraduate degree", 4 = "Postgraduate degree"
3	FH patients	Physical activity	Attitude	My doing physical activity at least three or more times per week over the next three months is…?	1 = useless; 6 = useful 1 = bad; 6 = good 1 = pleasant; 6 = unpleasant
			Subjective norm	Most people important to me think I should do physical activity at least three or more times per week over the next three months? To what extent does your family support you when it comes to doing physical activity at least three or more times per week over the next three months?	1 = disagree very strongly; 6 = agree very strongly 1 = no support at all; 6 = an extreme amount of support
			Perceived behavioral control	Whether or not I participate in physical activity at least three or more times per week over the next three months is entirely up to me? How much personal control do you feel you have over participating in physical activity at least three or more times per week over the next three months?	1 = disagree very strongly; 6 = agree very strongly 1 = very little control; 6 = complete control
			Intention	I intend to participate in physical activity at least three or more times per week in the next three months?	1 = extremely unlikely; 6 = extremely likely

			Income	What is your average total household income per year before taxes in AUD?	1= “Under AU$30,000”, 2 = “AU$30,001 to AU$52,000”, 3 = “AU$52,001 to AU$104,000”, 4 = “AU$104,001 to AU$156,000”, 5 = “AU$156,001 to AU$208,000”, 6 = “AU$208,001 to AU$260,000”, 7 = “greater than AU$260,000”.
			Education	What is your highest educational qualification?	1= “No qualifications”, 2 = “Other qualification”, 3 = “Secondary/high school or equivalent”, 4 = “Post-school training or college or equivalent”, 5 = “University degree/postgraduate degree”.
4	Adults	Dental flossing	Attitude	For me to floss my teeth on a daily basis in the next six weeks would be…?	1 = bad, 7 = good 1 = unpleasant, 7 = pleasant 1 = worthless, 7 = valuable
			Subjective norm	In regards to flossing your teeth on a daily basis in the next six weeks, do you agree that… Those people who are important to me would want me to floss my teeth? Most people who are important to me would approve of me flossing my teeth? Most people who are important to me think I should floss my teeth?	1 = strongly disagree, 7 = strongly agree
			Perceived behavioral control	In regards to flossing your teeth on a daily basis in the next six weeks, do you agree that… I have complete control over whether I floss my teeth? I am confident that I could floss my teeth? It is mostly up to me whether I floss my teeth? It would be easy for me to floss me teeth?	1 = strongly disagree, 7 = strongly agree
			Intention	In regards to flossing your teeth on a daily basis in the next six weeks, do you agree that… It is likely I will binge drink? I intend to binge drink? I expect to binge drink?	1 = strongly disagree, 7 = strongly agree
			Behavior	Think about the past 6 weeks. In general, how often did you floss your teeth on a daily basis? Think about the past 6 weeks. In general, to what extent did you floss your teeth on a daily basis?	1 = never, 7 = always 1 = never, 7 = a large extent

			Income	What is your annual household taxable income range?	1= “Zero to AU$18,200”, 2 = “AU$18,201 to AU$37,000”, 3 = “AU$37,001 to AU$80,000”, 4 = “AU$80,001 to AU$180,000”, 5 = “greater than AU$180,001”
			Education	What is your highest educational achievement?	1= “Completed junior/senior school”, 2 = “TAFE Certificate/Diploma”, 3 = “Undergraduate degree”, 4 = “Postgraduate degree”
5	University students	Heavy episodic drinking	Attitude	Engaging in heavy episodic drinking over the next four weeks would be…?	1 = bad, 7 = good 1 = unwise, 7 = wise 1 = unpleasant, 7 = pleasant 1 = awful, 7 = nice
			Subjective norm	In regards to engaging in heavy episodic drinking over the next four weeks, do you agree that… Those people who are important to me would want me to engage in heavy episodic drinking? Most people who are important to me would approve of me engaging in heavy episodic drinking? Most people who are important to me think I should engage in heavy episodic drinking?	1 = strongly disagree, 7 = strongly agree
			Perceived behavioral control	In regards to engaging in heavy episodic drinking over the next four weeks, do you agree that… I have complete control over whether I engage in heavy episodic drinking? It is up to me whether I engage in heavy episodic drinking? If I wanted to it would be easy for me to engage in heavy episodic drinking? I am confident that I could engage in heavy episodic drinking?	1 = strongly disagree, 7 = strongly agree
			Intention	In regards to engaging in heavy episodic drinking over the next four weeks, do you agree that… I am willing to engage in heavy episodic drinking? I intend to engage in heavy episodic drinking? I expect to engage in heavy episodic drinking? It is likely that I will engage in heavy episodic drinking in the next four weeks?	1 = strongly disagree, 7 = strongly agree
			Behavior	Think about the past four weeks. In general, how often did you engage in heavy episodic drinking?	1 = never, 7 = always 1 = never, 7 = a large extent

				Think about the past four weeks. In general, to what extent did you did you engage in heavy episodic drinking?	
			Income	What is your annual household taxable income range?	1= "Zero to AU$18,200", 2 = "AU$18,201 to AU$37,000", 3 = "AU$37,001 to AU$80,000", 4 = "AU$80,001 to AU$180,000", 5 = "greater than AU$180,001"
			Education	What is your highest educational achievement?	1 = "Junior school", 2 = "Senior school", 3 = "TAFE Certificate/Diploma", 4 = "Undergraduate degree", 5 = "Postgraduate degree"
6	Older adults	Physical activity	Attitude	For me to do regular physical activity in the next week would be …?	1 = bad, 7 = good 1 = harmful, 7 = beneficial 1 = boring, 7 = interesting 1 = unenjoyable, 7 = enjoyable
			Subjective norm	In regards to doing regular physical activity in the next week, do you agree that… People who are important to me would want me to engage in regular physical activity? Most people who are important to me would approve of my engaging in regular physical activity?	1 = strongly disagree, 7 = strongly agree
			Perceived behavioral control	In regards to doing regular physical activity in the next week, do you agree that… It is mostly up to me whether or not I engage in regular physical activity? I have complete control over whether I engage in regular physical activity? It would be easy for me to engage in regular physical activity? I am confident that I can engage in regular physical activity?	1 = strongly disagree, 7 = strongly agree
			Intention	In regards to doing regular physical activity in the next week, do you agree that… It is likely that I will be regularly physically active? I intend to be regularly physically active? I expect that I will be regularly physically active?	1 = strongly disagree, 7 = strongly agree
			Behavior	On how many days in the past week (past 7 days) have you engaged in at least 30 minutes of at least moderate-intensity physical activity? In the previous week, how often did you engage in regular physical activity? 1 = not at all, 7 = a great extent	0 days to 7 days 1 = never, 7 = always

				In the previous week, to what extent did you engage in regular physical activity?	
			Income	What is your annual household taxable income range?	1= “Less than 300”, 2 = “AU$300 to AU$500”, 3 = “AU$501 to AU$800”, 4 = “AU$801 to AU$1,000”, 5 = “AU$1,001 to AU$1,500”, 6 = “AU$1,501 to AU$2,500”, 7 = “more than AU$2,500”.
			Education	What is your highest educational achievement?	1 = “Less than school grade 10”, 2 = “School grade 10”, 3 = “School grade 12”, 4 = “Diploma/trade certificate”, 5 = “Undergraduate degree”, 6 = “Postgraduate degree”.
7	Parents	Sun safety behaviors for children (sample 1)	Attitude	Performing sun-protective behaviours for my child every time they go in the sun for more than 10 minutes during the next 2 weeks would be...?	1 = Unpleasant, 7 =Pleasant 1 = Bad, 7 = Good 1 = Unwise, 7 = Wise 1 = Awful, 7 = Nice 1 = Unfavourable, 7 Favourable
			Subjective norm	Those people who are important to me would want me to perform sun-protective behaviours for my child every time they go in the sun for more than 10 minutes during the next 2 weeks? Most people who are important to me would approve of me performing sun-protective behaviours for my child every time they go in the sun for more than 10 minutes during the next 2 weeks? Most people who are important to me think I should perform sun-protective behaviours for my child every time they go in the sun for more than 10 minutes during the next 2 weeks?	1 = strongly disagree; 7 = strongly agree
			Perceived behavioral control	I have complete control over whether my child’s sun-protective behaviours are performed every time they go in the sun for more than 10 minutes in the next 2 weeks? It is mostly up to me whether my child’s sun-protective behaviours are performed every time they go in the sun for more than 10 minutes in the next 2 weeks? If I wanted to it would be easy for me to perform sun-protective behaviours for my child every time they go in the sun for more than 10 minutes in the next 2 weeks?	1 = strongly disagree, 7 = strongly agree

				I am confident that I could perform sun-protective behaviours for my child every time they go in the sun for more than 10 minutes in the next 2 weeks?	
			Intention	I am willing to perform sun-protective behaviours for my child every time they go in the sun for more than 10 minutes during the next 2 weeks?	1 = strongly disagree, 7 = strongly agree
				I intend to perform sun-protective behaviours for my child every time they go in the sun for more than 10 minutes during the next 2 weeks?	
				I plan to perform sun-protective behaviours for my child every time they go in the sun for more than 10 minutes during the next 2 weeks?	
				It is likely that I will perform sun-protective behaviours for my child every time they go in the sun for more than 10 minutes during the next 2 weeks?	
			Behavior	Think about the past 2 weeks. In general, how often did you perform sun-protective behaviours for your child?	1 = never, 7 = always
				Think about the past 2 weeks. To what extent did you ensure that you performed sun-protective behaviours for your child?	1 = not at all, 7 = a large extent
			Income	What is your annual household taxable income range?	1= “Zero to AU$18,200”, 2 = “AU$18,201 to AU$37,000”, 3 = “AU$37,001 to AU$80,000”, 4 = “AU$80,001 to AU$180,000”, 5 = “greater than AU$180,001”
			Education	What is your highest educational achievement?	1 = “Junior school”, 2 = “Senior school”, 3 = “TAFE Certificate/Diploma”, 4 = “Undergraduate degree”, 5 = “Postgraduate degree”
8	Parents (National)	Swimming pool safety behaviors for children	Attitude	For me to supervise young children around my pool in the next month would be…?	1 = bad, 7 = good
					1 = unwise, 7 = wise
					1 = worthless, 7 = valuable
					1 = negative, 7 = positive
			Subjective norm	Please indicate how much you agree/disagree with each of the following statements in the next month…	1 = strongly disagree, 7 = strongly agree
				Those people who are important to me would approve of me supervising young children around my pool?	
				Those people who are important to me would want me to supervise young children around my pool?	
				Those people who are important to me think I should supervise young children around my pool?	

			Perceived behavioral control	Please indicate how much you agree/disagree with each of the following statements in the next month… I have complete control over whether I supervise young children around my pool? It is mostly up to me whether I supervise young children around my pool? It would be easy for me to supervise young children around my pool? I am confident I can supervise young children around my pool?	1 = strongly disagree, 7 = strongly agree
			Intention	Please indicate how much you agree/disagree with each of the following statements in the next month… I plan to supervise young children around my pool? I intend to supervise young children around my pool? It is likely that I will supervise young children around my pool?	1 = extremely unlikely, 7 = extremely likely
			Income	What is your annual household taxable income range?	1= "Zero to AU$18,200", 2 = "AU$18,201 to AU$37,000", 3 = "AU$37,001 to AU$80,000", 4 = "AU$80,001 to AU$180,000", 5 = "greater than AU$180,001"
			Education	What is your highest educational achievement?	1 = "Completed junior school (yr 10)", 2 = "Completed senior school (yr 12)", 3 = "TAFE certificate/diploma", 4 = "Undergraduate degree", 5 = "Postgraduate degree"
9	Parents (Regional)	Swimming pool safety behaviors for children	Attitude	For me to supervise young children around my pool in the next month would be…?	1 = bad, 7 = good 1 = unwise, 7 = wise 1 = worthless, 7 = valuable 1 = negative, 7 = positive
			Subjective norm	Please indicate how much you agree/disagree with each of the following statements in the next month… Those people who are important to me would approve of me supervising young children around my pool? Those people who are important to me would want me to supervise young children around my pool? Those people who are important to me think I should supervise young children around my pool?	1 = strongly disagree, 7 = strongly agree
			Perceived behavioral control	Please indicate how much you agree/disagree with each of the following statements in the next month… I have complete control over whether I supervise young children around my pool?	1 = strongly disagree, 7 = strongly agree

				It is mostly up to me whether I supervise young children around my pool? It would be easy for me to supervise young children around my pool? I am confident I can supervise young children around my pool?	
			Intention	Please indicate how much you agree/disagree with each of the following statements in the next month… I plan to supervise young children around my pool? I intend to supervise young children around my pool? It is likely that I will supervise young children around my pool?	1 = extremely unlikely, 7 = extremely likely
			Income	Family taxable income range?	1= "Zero to AU$18,200", 2 = "AU$18,201 to AU$37,000", 3 = "AU$37,001 to AU$80,000", 4 = "AU$80,001 to AU$180,000", 5 = "greater than AU$180,001"
			Education	What is your highest educational achievement?	1 = "Completed junior school (yr 10)", 2 = "Completed senior school (yr 12)", 3 = "TAFE certificate/diploma", 4 = "Undergraduate degree", 5 = "Postgraduate degree"
10	Pregnant women	Physical activity	Attitude	Preforming the recommended level of physical activity over the next week would be…	1 = undesirable, 7 = desirable 1 = bad, 7 = good 1 = unpleasant, 7 = pleasant 1 = harmful, 7 = beneficial
			Subjective norm	Most people who are important to me would approve of me performing the recommended level of physical activity in the next week? Those people who are important to me think that I should perform the recommended level of physical activity in the next week? The people in my life whose opinion I value would think performing the recommended level of physical activity in the next week is desirable?	1 = strongly disagree, 7 = strongly agree
			Perceived behavioral control	It is mostly up to me whether I perform the recommended level of physical activity in the next week? It would be easy for me to perform the recommended level of physical activity in the next week? I have complete control over whether I perform the recommended level of physical activity in the next week? I am confident that I could perform the recommended level of physical activity in the next week?	1 = strongly disagree, 7 = strongly agree

			Intention	I plan to perform the recommended level of physical activity in the next week? I intend to perform the recommended level of physical activity in the next week? I expect that I will perform the recommended level of physical activity in the next week? I am willing to perform the recommended level of physical activity in the next week?	1 = strongly disagree, 7 = strongly agree
			Behavior	In the previous week, to what extent did you perform physical activity following the recommended guidelines? In the previous week, on how many days did you did you perform physical activity following the recommended guidelines? In the previous week, how often did you did you perform physical activity following the recommended guidelines?	1 = not at all, 7 = a large extent 0 days to 7 days 1 = never, 7 = very often
			Income	What is your annual household taxable income range?	1= "Zero to AU$18,200", 2 = "AU$18,201 to AU$37,000", 3 = "AU$37,001 to AU$80,000", 4 = "AU$80,001 to AU$180,000", 5 = "greater than AU$180,001"
			Education	What is your highest educational achievement?	1 = "Junior school", 2 = "Senior school", 3 = "TAFE Certificate/Diploma", 4 = "Undergraduate degree", 5 = "Postgraduate degree"
11	University student	Drinking alcohol within safe limits	Attitude	How likely will the following result if you drank alcohol within safe limits on each individual occasion over the next four weeks…?	1 = unwise, 7 = wise 1 = bad, 7 = good 1 = unpleasant, 7 = pleasant 1 = awful, 7 = nice
			Subjective norm	In regards to drinking alcohol within safe limits on each individual occasion over the next four weeks, do you agree that... Most people who are important to me would approve of me drinking alcohol within safe limits? Most people who are important to me think I should drink alcohol within safe limits?	1 = strongly disagree, 7 = strongly agree
			Perceived behavioral control	In regards to drinking alcohol within safe limits on each individual occasion over the next four weeks, do you agree that... I have complete control over whether I drink alcohol within safe limits? It is up to me whether I drink alcohol within safe limits? If I wanted to it would be easy for me to drink alcohol within safe limits?	1 = strongly disagree, 7 = strongly agree

				I am confident that I could drink alcohol within safe limits?	
			Intention	In regards to drinking alcohol within safe limits on each individual occasion over the next four weeks, do you agree that... I will drink alcohol within safe limits? I intend to drink alcohol within safe limits? I expect to drink alcohol within safe limits?	1 = strongly disagree, 7 = strongly agree
			Behavior	Think about the past four weeks. In general, how often did you drink alcohol within safe limits on each individual occasion?	1 = never, 7 = always
				Think about the past four weeks. In general, to what extent did you did you drink alcohol within safe limits on each individual occasion?	1 = never, 7 = a large extent
			Income	What is your annual household taxable income range?	1= “Zero to AU$18,200”, 2 = “AU$18,201 to AU$37,000”, 3 = “AU$37,001 to AU$80,000”, 4 = “AU$80,001 to AU$180,000”, 5 = “greater than AU$180,001”
			Education	What is your highest education achievement?	1 = “Junior school”, 2 = “Senior school”, 3 = “TAFE Certificate/Diploma”, 4 = “Undergraduate degree”, 5 = “Postgraduate degree”
12	Parents	Sun safety behaviors for children (sample 2)	Attitude	For me to perform sun-protective behaviors for my child in the next six weeks would be…	1 = “bad”, 7 = “good” 1 = “unpleasant”, 7 = “pleasant” 1 = “unfavourable”, 7 = “favourable” 1 = “unwise”, 7 = “wise” 1 = “awful”, 7 = “nice”
			Subjective norm	In regards to performing sun-protective behaviors for your child in the next six weeks, do you agree that… Those people who are important to me would want me to perform sun-protective behaviors for my child? Most people who are important to me would approve of me performing sun-protective behaviors for my child? Most people who are important to me think I should perform sun-protective behaviors for my child?	1 = strongly disagree, 7 = strongly agree
			Perceived behavioral control	In regards to performing sun-protective behaviors for your child in the next six weeks, do you agree that… I have complete control over whether I perform sun-protective behaviors for my child?	1 = strongly disagree, 7 = strongly agree

				I am confident that I could perform sun-protective behaviors for my child?	
				It is mostly up to me whether I perform sun-protective behaviors for my child?	
				It would be easy for me to perform sun-protective behaviors for my child?	
			Intention	In regards to performing sun-protective behaviors for your child in the next six weeks, do you agree that…	1 = strongly disagree, 7 = strongly agree
				It is likely I will perform sun-protective behaviors for my child?	
				I intend to perform sun-protective behaviors for my child?	
				I expect to perform sun-protective behaviors for my child?	
			Behavior	Think about the past 6 weeks. In general, how often did you perform sun-protective behaviors for your child?	1 = never, 7 = always
				Think about the past 6 weeks. In general, to what extent did you perform sun-protective behaviors for your child?	1 = never, 7 = a large extent
			Income	What is your annual household taxable income range?	1= “Zero to AU$18,200”, 2 = “AU$18,201 to AU$37,000”, 3 = “AU$37,001 to AU$80,000”, 4 = “AU$80,001 to AU$180,000”, 5 = “greater than AU$180,001”
			Education	What is your highest educational achievement?	1= “Completed junior/senior school”, 2 = “TAFE Certificate/Diploma”, 3 = “Undergraduate degree”, 4 = “Postgraduate degree”
13	Parents	Tooth brushing for children	Attitude	Supervising my child brushing their teeth for 2 minutes twice daily in the next two weeks would be…?	1 = worthless, 6 = valuable 1 = bad, 7 = good 1 = unpleasant, 7 = pleasant
			Subjective norm	Those people who are important to me would want me to supervise my child brushing their teeth in the next two weeks?	1 = strongly disagree, 7 = strongly agree
				Most people who are important to me would approve of me supervising my child brushing their teeth in the next two weeks?	
				Most people who are important to me think I should supervise my child brushing their teeth in the next two weeks?	
			Perceived behavioral control	In regards to supervising my child brushing their teeth for 2 minutes twice daily, do you agree that in the next two weeks…	1 = strongly disagree, 7 = strongly agree
				It is mostly up to me whether I supervise my child brushing their teeth?	
				I have complete control over whether I supervise my child brushing their teeth?	
				It would be easy for me to supervise my child brushing their teeth?	
				I am confident that I could supervise my child brushing their teeth?	

	Intention	In regards to supervising my child brushing their teeth for 2 minutes twice daily, do you agree that in the next two weeks… It is likely that I will supervise my child brushing their teeth? I intend to supervise my child brushing their teeth? I plan to supervise my child brushing their teeth?	1 = strongly disagree, 7 = strongly agree
	Behavior	Think about the past two weeks. In general, how often did you supervise your child brushing their teeth for 2 minutes twice daily?	1 = never, 7 = always
		Think about the past two weeks. In general, to what extent did you supervise your child brushing their teeth for 2 minutes twice daily?	1 = never, 7 = a large extent
	Income	What is your annual household taxable income range?	1= “Zero to AU$18,200”, 2 = “AU$18,201 to AU$37,000”, 3 = “AU$37,001 to AU$80,000”, 4 = “AU$80,001 to AU$180,000”, 5 = “greater than AU$180,001”
	Education	What is your highest educational achievement?	1 = “Junior school”, 2 = “Senior school”, 3 = “TAFE Certificate/Diploma”, 4 = “Undergraduate degree”, 5 = “Postgraduate degree”

Note. FH = Familial hypercholesterolemia.

Appendix D

Full Details of Data Analysis

Missing Data

Prior to conducting our path analytic models, we tested the hypothesis that missing data were missing completely at random using Little's (1988) MCAR test. The MCAR test revealed statistically non-significant chi-square values for most of the datasets, which provided support for the hypothesis that data were missing completely at random. However, statistically significant values were identified in the older adult physical activity (χ^2 (85) = 125.850, p = .002), parent-for-child sun safety (sample 1) (χ^2 (49) = 146.012, p < .001), and pregnant women physical activity (χ^2 (7) = 14.731, p = .039) samples. The test was not appropriate for the parent-for-child pool safety national and regional samples as there was only one missing data point in each sample. These findings suggest some systematic missingness in the data for these samples. While there is some debate over the value of Little's MCAR test for cross-sectional data, where there is evidence in favor of rejecting the hypothesis that data are missing completely at random, subsequent analyses should employ a maximum likelihood estimation method, so we complied with this recommendation in subsequent path analyses (Matta, Flournoy, & Byrne, 2018).

Single Sample Path Analyses

Path analysis was selected in favor of a full latent variable structural equation model due to the complexity of the model. However, prior to data analysis we ensured each social cognition construct and behavior measure had adequate internal consistency by estimating an appropriate reliability coefficient. For constructs with measures comprising three items or more, we used Revelle's Omega coefficient, while for constructs with two items we estimated the inter-item correlation. Path analytic models were estimated using the robust maximum likelihood estimation method with missing data imputed using full information maximum likelihood (FIML) method.

Meta-Analytic Structural Equation Modeling

We extracted correlation matrices among socio-demographic, social cognition, and behavior variables for each dataset and used them as input into a meta-analytic structural equation model using the MASEM package (Cheung, 2015) in R. The analysis is conducted in two stages. In the first stage, correlation matrices among variables of the proposed model from each dataset are transformed to account for study-specific random effects, enabling them to be analyzed as covariance matrices in a structural equation model. The first stage analysis produces a pooled correlation matrix which represents the zero-order correlations among study constructs corrected for sampling error across studies with 95% confidence intervals. The analysis also provides homogeneity tests for each model parameter: Cochran's (1952) *Q*, the τ^2 statistic, and I^2 statistic and its 95% confidence interval. In the second stage of the analysis, a model representing proposed effects among study variables is fitted to the covariance matrix derived from the first stage. The adequacy of the model in accounting for the pooled correlation matrix is assessed using the same multiple goodness-of-fit criteria used in the single-sample path analyses: the goodness-of-fit chi-square, CFI, TLI, RMSEA and its 95% confidence interval, and the SRMSR with the same cutoff criteria applied for adequate model fit.

Justification of Use of Meta-Analytic Structural Equation Modeling Instead of Multi-Group Path Analysis

We considered available analytic methods to assess the fit of the proposed model with the data from the current datasets. One option was to conduct a multigroup path analysis and assess the goodness-of-fit of a model in which estimated effects among the variables of the proposed model were set to be invariant across datasets. However, this method has a number of disadvantages. First, it requires complete data for each estimated effect in the proposed model. This was not available in the current sample as three datasets not include a behavioral measure,

and the gender variable on dataset was a constant because the sample comprised entirely of female participants (dataset 10, pregnant women physical activity sample) and, therefore, had no variance. This meant that a multigroup analysis would have to be conducted on the subgroup of datasets for which complete data were available and datasets that did not include measures with zero variance. As an alternative, we opted to apply meta-analytic structural equation modeling. This method has the advantage of enabling the evaluation of the fit of the proposed model with the pooled correlation matrices among variables from all datasets. The analysis is able to handle empty cells in the correlation matrices which eliminates the problem of datasets missing variables or with zero variance. Such a model provides an estimation as to whether the model is tenable across the pooled data from the samples, the extent to which the effect size for each model effect is likely to differ from zero, and the extent to which each effect varies across studies after accounting for the methodological artifact of sampling error.

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Appendix E

Socio-Demographic Characteristics of Each Sample

Dataset	Sample	Behavior	*N*	Age[a]		Gender[a]		Income[a]		Education[a]	
				M	*SD*	M	F	Low	Middle/ High	Low	Middle/ High
1	University students	Dental flossing	626	21.21	4.89	21.39	78.61	71.83	28.17	57.54	42.46
2	University students	Binge drinking	321	23.05	7.52	23.51	76.49	63.72	36.28	56.88	43.12
3	FH patients	Physical activity	110	50.65	13.81	43.64	56.36	57.14	42.86	29.58	70.42
4	Adults	Dental flossing	272	32.24	12.13	16.61	83.39	51.12	48.88	22.43	77.57
5	University students	Heavy episodic drinking	204	20.03	2.14	31.37	68.63	63.68	36.32	66.67	33.33
6	Older adults	Physical activity	213	73.74	7.11	31.60	68.40	67.01	32.99	41.63	58.37
7	Parents	Sun safety behaviors for children (sample 1)	373	35.09	5.39	15.82	84.18	27.30	72.70	34.65	65.35
8	Parents (National)	Swimming pool safety behaviors for children	509	34.67	8.76	25.34	74.66	50.29	49.71	28.29	71.71
9	Parents (Regional)	Swimming pool safety behaviors for children	528	33.11	9.06	46.59	53.41	42.23	57.77	15.91	84.09
10	Pregnant women	Physical activity	207	30.04	4.50	0.00	100.00	38.16	61.84	19.32	80.68
11	University students	Drinking alcohol within safe limits	267	20.53	3.49	27.44	72.56	67.17	32.83	70.57	29.43
12	Parents	Sun safety behaviors for children (sample 2)	192	35.11	5.12	19.27	80.73	24.87	75.13	9.04	90.96
13	Parents	Toothbrushing for children	281	37.05	4.69	28.78	71.22	15.81	84.19	6.91	93.09
Full	–	–	4103	32.16	14.04	25.82	74.18	49.82	50.18	36.27	63.73

Note. [a]Values are percentages excluding missing data. M = Males; F = Females; FH = Familial hypercholesterolemia.

Appendix F

Descriptive Statistics and Reliability Coefficients for Theory of Planned Behavior Constructs in Each Dataset

Dataset	Construct	*M*	*SD*	Rel.	Items	Dataset	Construct	*M*	*SD*	Rel.	Items
1	Intention[a]	3.483	1.928	.924	3	7	SN[a]	6.165	0.770	.888	5
	Attitude[a]	5.446	1.497	.862	3		PBC[a]	5.854	1.011	.833	4
	SN[b]	4.587	1.498	.658	2		Behavior[a]	5.641	1.339	.759	4
	PBC[a]	5.989	1.054	.889	4	8	Intention[a]	6.458	0.977	.918	3
	Behavior[b]	3.778	2.050	.958	2		Attitude[a]	6.468	1.153	.965	4
2	Intention[a]	3.027	2.079	.959	3		SN[a]	6.501	0.929	.933	3
	Attitude[a]	2.991	1.745	.919	3		PBC[a]	6.410	0.916	.911	4
	SN[a]	2.540	1.486	.927	4	9	Intention[a]	6.111	1.153	.903	3
	PBC[a]	5.123	1.519	.935	4		Attitude[a]	6.276	1.126	.945	4
	Behavior[b]	2.155	1.347	.864	2		SN[b]	6.110	1.168	.928	3
3	Intention[c]	4.395	1.516	–	1		PBC[d]	6.040	1.142	.933	4
	Attitude[a]	4.332	0.979	.893	3	10	Intention[a]	5.124	1.701	.904	4
	SN[b]	3.959	1.000	.521	2		Attitude[a]	5.767	1.272	.900	4
	PBC[b]	5.164	0.922	.638	2		SN[a]	5.829	1.352	.937	3
4	Intention[a]	4.979	1.868	.949	3		PBC[a]	5.458	1.229	.846	4
	Attitude[a]	6.039	1.119	.800	3		Behavior[a]	4.014	1.766	.950	3
	SN[a]	4.863	1.544	.688	4	11	Intention[a]	5.411	1.771	.955	3
	PBC[a]	6.059	1.099	.912	4		Attitude[a]	5.690	1.362	.949	4
	Behavior[b]	3.915	2.177	.954	2		SN[b]	5.775	1.225	.680	2
5	Intention[a]	3.929	1.889	.976	4		PBC[a]	6.301	1.027	.949	4
	Attitude[a]	3.461	1.495	.944	4		Behavior[b]	4.621	2.160	.940	2
	SN[a]	3.111	1.542	.899	3	12	Intention[a]	6.551	0.868	.894	3
	PBC[a]	5.895	1.005	.904	4		Attitude[a]	6.409	1.006	.939	5
	Behavior[b]	2.429	1.434	.939	2		SN[a]	6.454	0.720	.921	5
6	Intention[a]	5.549	1.674	.985	3		PBC[a]	6.285	0.746	.799	4
	Attitude[a]	5.876	1.452	.906	4		Behavior[b]	5.160	1.689	.965	2
	SN[b]	5.107	1.521	.783	2	13	Intention[a]	6.172	1.356	.970	3
	PBC[a]	5.850	1.293	.959	4		Attitude[a]	5.753	1.366	.867	3
	Behavior[a]	4.716	1.416	.870	3		SN[a]	5.792	1.160	.877	3
7	Intention[a]	6.379	0.758	.955	4		PBC[a]	5.985	0.992	.857	4
	Attitude[a]	5.882	1.081	.927	5		Behavior[b]	6.041	1.269	.950	2

Note. [a]Reliability estimate is Revelle's omega coefficient (ω); [b]Reliability estimate is the Spearman rank-order correlation coefficient (ρ) between items; [c]Single item, no reliability computed; [d]Ordinal data assumed, reliability estimate is ordinal omega coefficient (ω). Rel. = Reliability coefficient; Items = Number of items; SN = Subjective norms; PBC = Perceived behavioral control.

Appendix G
Correlation Matrices Among Study Variables

Table G1
Correlation Matrix Among Study Variables from Dataset 1 (Student Dental Flossing Sample)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.683***	1.000							
3. Attitude	.108**	.150***	1.000						
4. SN	.226***	.327***	.173***	1.000					
5. PBC	.157	.212***	.271***	.280***	1.000				
6. Education	.092	.075	.058	-.028	-.007	1.000			
7. Income	-.022	-.074	-.003	.031	-.010	-.030	1.000		
8. Age	.056	.069	.020	-.021	.037	.352***	-.033	1.000	
9. Gender	.113*	.174***	.033	-.009	.062	-.018	-.002	-.130**	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.
* $p < .05$ ** $p < .01$ *** $p < .001$

Table G2

Correlation Matrix Among Study Variables from Dataset 2 (Student Binge Drinking Sample)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.420***	1.000							
3. Attitude	.311***	.738***	1.000						
4. SN	.285**	.669***	.674***	1.000					
5. PBC	.255**	.510***	.425***	.454***	1.000				
6. Education	-.083	-.110	-.047	-.068	.030	1.000			
7. Income	.027	-.014	-.055	-.027	.066	-.121	1.000		
8. Age	-.155*	-.178*	-.132	-.123	-.086	.496***	.025	1.000	
9. Gender	-.034	.044	.031	.042	.008	-.013	.051	-.054	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G3

Correlation Matrix Among Study Variables from Dataset 3 (Familial Hypercholesterolemia Patient Physical Activity Sample)

	1	2	3	4	5	6	7	8
1. Intention	1.000							
2. Attitude	.578***	1.000						
3. SN	.332***	.259**	1.000					
4. PBC	.406***	.239*	.333***	1.000				
5. Education	.097	-.005	.026	.068	1.000			
6. Income	.147	-.039	.090	.023	.376**	1.000		
7. Age	-.078	-.073	-.138	-.004	-.145	-.222*	1.000	
8. Gender	.087	.043	.056	.127	.031	-.232	.023	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G4

Correlation Matrix Among Study Variables from Dataset 4 (Adult Dental Flossing Sample)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.721***	1.000							
3. Attitude	.479***	.642***	1.000						
4. SN	.261***	.403***	.408***	1.000					
5. PBC	.515***	.552***	.393***	.216***	1.000				
6. Education	.042	.025	.071	.101	-.029	1.000			
7. Income	.124	.093	.127	.066	.111	.186**	1.000		
8. Age	.271***	.154	.152	-.051	.041	.458***	.256**	1.000	
9. Gender	-.004	.001	.079	-.077	-.064	-.097	-.019	-.058	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G5

Correlation Matrix Among Study Variables from Dataset 5 (Student Heavy Episodic Drinking Sample)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.433***	1.000							
3. Attitude	.278***	.638***	1.000						
4. SN	.190***	.429***	.540***	1.000					
5. PBC	.040	.339***	.275***	.164*	1.000				
6. Education	.041	.010	.102	.116	.002	1.000			
7. Income	-.045	.086	-.013	-.005	.013	-.133	1.000		
8. Age	.073	.084	.095	.146*	.018	.450***	-.100	1.000	
9. Gender	-.049	-.187**	-.085	-.123	-.176*	.052	.026	-.152*	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G6

Correlation Matrix Among Study Variables from Dataset 6 (Older Adults' Physical Activity Sample)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.561***	1.000							
3. Attitude	.330***	.599***	1.000						
4. SN	.164*	.304***	.280***	1.000					
5. PBC	.421***	.713***	.501***	.286***	1.000				
6. Education	.045	.192*	.180*	.090	.178*	1.000			
7. Income	.036	.162*	.138	.181*	.187**	.108	1.000		
8. Age	-.030	-.235**	-.210**	-.102	-.240**	-.102	-.220**	1.000	
9. Gender	-.006	-.056	.068	-.105	-.053	-.181**	-.193**	-.009	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G7

Correlation Matrix Among Study Variables from Dataset 7 (Parent-for-Child Sun Safety Behaviors Sample 1)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.462***	1.000							
3. Attitude	.271***	.548***	1.000						
4. SN	.234***	.434***	.332***	1.000					
5. PBC	.296***	.423***	.337***	.332***	1.000				
6. Education	.177*	-.031	-.002	.024	-.088	1.000			
7. Income	-.060	-.090	-.085	-.032	-.194**	.152	1.000		
8. Age	.027	-.155	-.102	-.032	-.219***	.112	.265***	1.000	
9. Gender	.064	.133	.027	.021	.143	-.038	-.199**	-.268***	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G8

Correlation Matrix Among Study Variables from Dataset 8 (Parent-for-Child Swim Safety Behaviors National Sample)

	1	2	3	4	5	6	7	8
1. Intention	1.000							
2. Attitude	.572***	1.000						
3. SN	.806***	.543***	1.000					
4. PBC	.770***	.542***	.824***	1.000				
5. Education	-.097*	-.046	-.071	-.112*	1.000			
6. Income	.025	.080	.039	.016	.223***	1.000		
7. Age	.130**	.038	.113*	.091*	.041	.090*	1.000	
8. Gender	.295***	.231***	.332***	.268***	-.105*	-.125**	-.224***	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G9

Correlation Matrix Among Study Variables from Dataset 9 (Parent-for-Child Swim Safety Behaviors Regional Sample)

	1	2	3	4	5	6	7	8
1. Intention	1.000							
2. Attitude	.718***	1.000						
3. SN	.832***	.729***	1.000					
4. PBC	.825***	.709***	.817***	1.000				
5. Education	.036	.010	.011	-.039	1.000			
6. Income	.101*	.119**	.086*	.108*	.152***	1.000		
7. Age	.188***	.150**	.134**	.146**	.121**	.225***	1.000	
8. Gender	.156***	.188***	.152***	.167***	-.084	-.015	-.087*	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G10

Correlation Matrix Among Study Variables from Dataset 10 (Pregnant Women Physical Activity Sample)

	1	2	3	4	5	6	7	8
1. Behavior	1.000							
2. Intention	.666***	1.000						
3. Attitude	.490***	.718***	1.000					
4. SN	.280***	.386***	.509***	1.000				
5. PBC	.540***	.692***	.520***	.355***	1.000			
6. Education	.102	.023	.141*	.110	-.082	1.000		
7. Income	-.007	-.010	.063	-.016	-.078	.296***	1.000	
8. Age	-.053	-.040	.115	.086	-.140*	.255***	.297***	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G11

Correlation Matrix Among Study Variables from Dataset 11 (Student Alcohol Consumption Safe Limits Sample)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.425***	1.000							
3. Attitude	.208***	.392***	1.000						
4. SN	.248***	.503***	.512***	1.000					
5. PBC	.223**	.298***	.458***	.490***	1.000				
6. Education	.082	.171**	.061	.137*	.093	1.000			
7. Income	.045	-.017	.047	.018	-.024	-.100	1.000		
8. Age	.100	.092	.052	-.001	.016	.413***	-.078	1.000	
9. Gender	.044	.099	.008	.040	-.019	-.029	-.079	-.107	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G12

Correlation Matrix Among Study Variables from Dataset 12 (Parent-for-Child Sun Safety Behaviors Sample 2)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.453***	1.000							
3. Attitude	.112	.232**	1.000						
4. SN	.096	.224**	.268**	1.000					
5. PBC	.112	.195*	.204*	.195	1.000				
6. Education	.007	-.035	.002	.145	.152	1.000			
7. Income	-.073	-.019	-.029	.111	.077	.159	1.000		
8. Age	-.168	-.243**	-.144	.013	-.085	.175	.281**	1.000	
9. Gender	-.046	.013	.092	.073	.274**	.040	-.158	-.096	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table G13

Correlation Matrix Among Study Variables from Dataset 13 (Parent-for-Child Toothbrushing Sample)

	1	2	3	4	5	6	7	8	9
1. Behavior	1.000								
2. Intention	.391***	1.000							
3. Attitude	.109***	.168**	1.000						
4. SN	.165**	.295***	.154*	1.000					
5. PBC	.405**	.318***	.184**	.264***	1.000				
6. Education	-.021	-.013	.021	.050	-.039	1.000			
7. Income	-.036	-.027	-.022	.088	.007	-.039	1.000		
8. Age	-.182*	-.016	-.041	-.009	-.016	-.039	.110	1.000	
9. Gender	.223**	.126*	.012	.038	.157**	-.016	-.119	-.112	1.000

Note. SN = Subjective norms; PBC = Perceived behavioral control.

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix H

Model Fit Indices for Path Analytic Models Estimated in Each Dataset and the Meta-Analytic Structural Equation Model for All Datasets

Dataset	Sample	Behavior	*N*	χ^2	*p*	df	CFI	TLI	RMSEA	95% CI		SRMSR
										LL	UL	
1	University students	Dental flossing	626	3.472	.176	2	0.997	0.951	.032	.000	.086	.011
2	University students	Binge drinking	321	0.909	.635	2	1.000	1.031	.000	.000	.092	.005
3[a]	FH patients	Physical activity	110	–	–	0	–	–	–	–	–	–
4	Adults	Dental flossing	272	0.316	.854	2	1.000	1.057	.000	.000	.064	.003
5	University students	Heavy episodic drinking	204	6.652	.036	2	0.981	0.666	.115	.025	.217	.026
6	Older adults	Physical activity	213	0.735	.692	2	1.000	1.076	.000	.000	.108	.007
7	Parents	Sun safety behaviors for children (sample 1)	373	5.713	.057	2	0.991	0.844	.073	.000	.146	.017
8[a]	Parents (National)	Swimming pool safety behaviors for children	509	–	–	0	–	–	–	–	–	–
9[a]	Parents (Regional)	Swimming pool safety behaviors for children	528	–	–	0	–	–	–	–	–	–
10	Pregnant women	Physical activity	207	4.823	.090	2	0.994	0.922	.079	.000	.171	.023
11	University students	Drinking alcohol within safe limits	267	2.055	.358	2	1.000	0.997	.010	.000	.119	.012
12	Parents	Sun safety behaviors for children (sample 2)	192	2.699	.259	2	0.989	0.799	.055	.000	.201	.021
13	Parents	Toothbrushing for children	281	3.693	.158	2	0.986	.748	.058	.000	.137	.016
All	MASEM	All	4103	0.859	.651	2	1.000	1.025	.000	.000	.024	.006

Note. [a]Models without a behavioral measure were fully saturated so goodness-of-fit statistics could not be computed. CFI = Comparative fit index; TLI = Tucker-Lewis Index; RMSEA = Root mean square error of approximation; 95% CI = 95% Confidence interval of the RMSEA; LL = Lower limit of the 95% CI of the RMSEA; UL = Upper limit of the 95% CI of the RMSEA; SRMSR = Standardized root mean square of the residuals; FH = Familial hypercholesterolemia.

Appendix I

Explained Variance in Intention and Behavior from Path Analytic Models Estimated in Each Dataset and the Meta-Analytic Structural Equation Model for All Datasets

Dataset	Sample and behavior	R^2 Intention	R^2 Behavior
1	Student dental flossing	.173	.470
2	Student binge drinking	.633	.189
3	FH patients' physical activity	.450	–
4	Adult flossing	.547	.572
5	Students heavy episodic drinking	.466	.209
6	Older adults' physical activity	.593	.333
7	Parent-for-child sun safety for children (sample 1)	.419	.280
8	National parent sample swimming supervision	.704	–
9	Regional parent sample swimming supervision	.769	–
10	Pregnant women physical activity	.656	.467
11	Students drinking within safe limits	.299	.199
12	Parent-for-child sun safety for children (sample 2)	.219	.150
13	Parents toothbrushing for children	.164	.285
All	MASEM	.395	.270

Note. MASEM = Meta-analytic structural equation model.

Appendix J

Results of Path Analytic Models Estimated in Each Sample from the Datasets in the Study

Table J1

Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 1 (Student Dental Flossing Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.721**	**0.630**	**0.812**	**.681**	**<.001**
PBC→Behavior	0.026	-0.145	0.197	.013	.766
Education→Behavior	0.185	-0.213	0.582	.045	.363
Income→Behavior	0.136	-0.301	0.572	.030	.542
Age→Behavior	-0.003	-0.036	0.030	-.007	.859
Gender→Behavior	-0.031	-0.462	0.401	-.006	.889
Attitude→Intention	0.080	-0.024	0.183	.062	.130
SN→Intention	**0.380**	**0.284**	**0.476**	**.295**	**<.001**
PBC→Intention	**0.181**	**0.048**	**0.314**	**.099**	**.008**
Education→Intention	0.219	-0.086	0.524	.056	.160
Income→Intention	**-0.333**	**-0.645**	**-0.022**	**-.078**	**.036**
Age→Intention	0.028	-0.004	0.060	.071	.084
Gender→Intention	**0.840**	**0.508**	**1.173**	**.179**	**.000**
Education→Attitude	0.171	-0.085	0.428	.057	.191
Income→Attitude	-0.002	-0.268	0.264	-.001	.988
Age→Attitude	0.002	-0.026	0.030	.005	.915
Gender→Attitude	0.126	-0.151	0.403	.034	.374
Education→SN	-0.069	-0.329	0.190	-.023	.601
Income→SN	0.098	-0.166	0.362	.029	.468
Age→SN	-0.004	-0.031	0.023	-.014	.759
Gender→SN	-0.041	-0.320	0.239	-.011	.777
Education→PBC	-0.054	-0.240	0.132	-.025	.567
Income→PBC	-0.020	-0.208	0.169	-.008	.838
Age→PBC	0.012	-0.007	0.030	.054	.208
Gender→PBC	0.176	-0.034	0.386	.068	.101
Correlations					
Attitude↔SN	**0.391**	**0.197**	**0.586**	**.175**	**.000**
Attitude↔PBC	**0.424**	**0.302**	**0.546**	**.271**	**.000**
SN↔PBC	**0.444**	**0.298**	**0.589**	**.283**	**.000**
Age↔Gender	**-0.260**	**-0.450**	**-0.069**	**-.130**	**.008**
Education↔Age	**0.849**	**0.653**	**1.046**	**.352**	**.000**
Income↔Age	-0.073	-0.258	0.112	-.033	.441
Education↔Gender	-0.004	-0.020	0.013	-.018	.661
Income↔Gender	0.000	-0.015	0.015	-.002	.964
Education↔Income	-0.007	-0.025	0.012	-.030	.475
Indirect effects					
Education→Attitude→Intention→Behavior	0.010	-0.010	0.029	.002	.324
Education→SN→Intention→Behavior	-0.019	-0.090	0.052	-.005	.602

Education→PBC→Intention→Behavior	-0.007	-0.031	0.017	-.002	.565
Education→Intention→Behavior	0.158	-0.063	0.379	.038	.162
Education→PBC→Behavior	-0.001	-0.012	0.009	.000	.793
Education→Behavior (total indir)	0.140	-0.098	0.378	.034	.249
Education→Behavior (total)	0.325	-0.137	0.786	.079	.168
Income→Attitude→Intention→Behavior	0.000	-0.015	0.015	.000	.988
Income→SN→Intention→Behavior	0.027	-0.046	0.099	.006	.470
Income→PBC→Intention→Behavior	-0.003	-0.027	0.022	-.001	.839
Income→Intention→Behavior	**-0.240**	**-0.465**	**-0.016**	**-.053**	**.036**
Income→PBC→Behavior	-0.001	-0.007	0.006	.000	.872
Income→Behavior (total indir)	-0.217	-0.460	0.027	-.048	.081
Income→Behavior (total)	-0.081	-0.577	0.415	-.018	.749
Age→Attitude→Intention→Behavior	0.000	-0.002	0.002	.000	.915
Age→SN→Intention→Behavior	-0.001	-0.009	0.006	-.003	.761
Age→PBC→Intention→Behavior	0.002	-0.001	0.004	.004	.250
Age→Intention→Behavior	0.020	-0.003	0.043	.048	.088
Age→PBC→Behavior	0.000	-0.002	0.002	.001	.769
Age→Behavior (total indir)	0.021	-0.005	0.047	.050	.121
Age→Behavior (total)	0.018	-0.026	0.062	.043	.422
Gender→Attitude→Intention→Behavior	0.007	-0.012	0.026	.001	.455
Gender→SN→Intention→Behavior	-0.011	-0.088	0.066	-.002	.777
Gender→PBC→Intention→Behavior	0.023	-0.009	0.055	.005	.163
Gender→Intention→Behavior	**0.606**	**0.351**	**0.860**	**.122**	**<.001**
Gender→PBC→Behavior	0.005	-0.026	0.035	.001	.767
Gender→Behavior (total indir)	**0.629**	**0.359**	**0.899**	**.126**	**<.001**
Gender→Behavior (total)	**0.599**	**0.073**	**1.124**	**.120**	**.026**
Education→Attitude→Intention	0.014	-0.013	0.041	.003	.321
Education→SN→Intention	-0.026	-0.125	0.073	-.007	.601
Education→PBC→Intention	-0.010	-0.043	0.024	-.003	.565
Education→Intention (total indir)	-0.023	-0.145	0.100	-.006	.719
Education→Intention (total)	0.196	-0.131	0.523	.050	.240
Income→Attitude→Intention	0.000	-0.021	0.021	.000	.988
Income→SN→Intention	0.037	-0.064	0.138	.009	.470
Income→PBC→Intention	-0.004	-0.038	0.031	-.001	.839
Income→Intention (total indir)	0.033	-0.089	0.156	.008	.593
Income→Intention (total)	-0.300	-0.636	0.036	-.070	.080
Age→Attitude→Intention	0.000	-0.002	0.002	.000	.915
Age→SN→Intention	-0.002	-0.012	0.009	-.004	.760
Age→PBC→Intention	0.002	-0.001	0.006	.005	.250
Age→Intention (total indir)	0.001	-0.012	0.014	.002	.923
Age→Intention (total)	0.029	-0.008	0.065	.073	.121
Gender→Attitude→Intention	0.010	-0.016	0.036	.002	.454
Gender→SN→Intention	-0.015	-0.122	0.091	-.003	.777
Gender→PBC→Intention	0.032	-0.013	0.076	.007	.162
Gender→Intention (total indir)	0.026	-0.108	0.161	.006	.700
Gender→Intention (total)	**0.867**	**0.508**	**1.225**	**.184**	**<.00**

Attitude→Intention→Behavior	0.057	-0.018	0.133	.042	.135
SN→Intention→Behavior	**0.274**	**0.197**	**0.351**	**.201**	**<.001**
PBC→Intention→Behavior	**0.131**	**0.033**	**0.228**	**.067**	**.009**
PBC→Behavior (total)	0.157	-0.035	0.349	.081	.110

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI_{95} = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J2
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 2 (Student Binge Drinking Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.248**	**0.144**	**0.351**	**.382**	**<.001**
PBC→Behavior	0.045	-0.083	0.172	.050	.491
Education→Behavior	0.015	-0.401	0.431	.006	.943
Income→Behavior	0.099	-0.296	0.494	.035	.624
Age→Behavior	-0.016	-0.038	0.006	-.090	.147
Gender→Behavior	-0.184	-0.601	0.233	-.058	.387
Attitude→Intention	**0.576**	**0.441**	**0.712**	**.482**	**<.001**
SN→Intention	**0.347**	**0.188**	**0.506**	**.248**	**<.001**
PBC→Intention	**0.262**	**0.156**	**0.367**	**.191**	**<.001**
Education→Intention	-0.239	-0.553	0.075	-.057	.136
Income→Intention	-0.002	-0.294	0.291	.000	.991
Age→Intention	-0.011	-0.033	0.012	-.038	.357
Gender→Intention	0.072	-0.269	0.413	.015	.678
Education→Attitude	0.050	-0.421	0.520	.014	.836
Income→Attitude	-0.185	-0.600	0.231	-.051	.384
Age→Attitude	**-0.031**	**-0.062**	**0.000**	**-.136**	**.047**
Gender→Attitude	0.109	-0.324	0.543	.027	.621
Education→SN	-0.044	-0.405	0.317	-.015	.811
Income→SN	-0.086	-0.434	0.262	-.028	.628
Age→SN	-0.022	-0.045	0.001	-.113	.059
Gender→SN	0.129	-0.248	0.506	.037	.502
Education→PBC	0.341	-0.022	0.705	.111	.066
Income→PBC	0.262	-0.077	0.602	.083	.130
Age→PBC	**-0.029**	**-0.055**	**-0.003**	**-.144**	**.027**
Gender→PBC	-0.010	-0.402	0.381	-.003	.959
Correlations					
Attitude↔SN	**1.686**	**1.399**	**1.974**	**.668**	**<.001**
Attitude↔PBC	**1.094**	**0.828**	**1.361**	**.425**	**<.001**
SN↔PBC	**1.003**	**0.768**	**1.238**	**.455**	**<.001**
Age↔Gender	-0.172	-0.551	0.208	-.054	.375
Education↔Age	**1.845**	**1.451**	**2.238**	**.496**	**<.001**
Income↔Age	0.089	-0.323	0.500	.025	.672
Education↔Gender	-0.003	-0.026	0.020	-.013	.816
Income↔Gender	0.010	-0.012	0.032	.051	.351
Education↔Income	**-0.029**	**-0.055**	**-0.003**	**-.121**	**.028**
Indirect effects					
Education→Attitude→Intention→Behavior	0.007	-0.060	0.074	.003	.836
Education→SN→Intention→Behavior	-0.004	-0.035	0.027	-.001	.812
Education→PBC→Intention→Behavior	0.022	-0.005	0.049	.008	.105
Education→Intention→Behavior	-0.059	-0.142	0.024	-.022	.162

Education→PBC→Behavior	0.015	-0.031	0.062	.006	.518
Education→Behavior (total indir)	-0.018	-0.167	0.130	-.007	.808
Education→Behavior (total)	-0.003	-0.448	0.441	-.001	.989
Income→Attitude→Intention→Behavior	-0.026	-0.088	0.035	-.009	.403
Income→SN→Intention→Behavior	-0.007	-0.038	0.023	-.003	.638
Income→PBC→Intention→Behavior	0.017	-0.007	0.041	.006	.156
Income→Intention→Behavior	0.000	-0.073	0.072	.000	.991
Income→PBC→Behavior	0.012	-0.026	0.049	.004	.540
Income→Behavior (total indir)	-0.005	-0.135	0.124	-.002	.935
Income→Behavior (total)	0.093	-0.322	0.508	.033	.660
Age→Attitude→Intention→Behavior	-0.004	-0.010	0.001	-.025	.082
Age→SN→Intention→Behavior	-0.002	-0.004	0.000	-.011	.108
Age→PBC→Intention→Behavior	-0.002	-0.004	0.000	-.011	.060
Age→Intention→Behavior	-0.003	-0.008	0.003	-.015	.370
Age→PBC→Behavior	-0.001	-0.005	0.003	-.007	.515
Age→Behavior (total indir)	**-0.012**	**-0.022**	**-0.003**	**-.068**	**.013**
Age→Behavior (total)	**-0.028**	**-0.052**	**-0.005**	**-.158**	**.018**
Gender→Attitude→Intention→Behavior	0.016	-0.047	0.079	.005	.627
Gender→SN→Intention→Behavior	0.011	-0.023	0.045	.004	.523
Gender→PBC→Intention→Behavior	-0.001	-0.026	0.025	.000	.959
Gender→Intention→Behavior	0.018	-0.066	0.102	.006	.677
Gender→PBC→Behavior	0.000	-0.018	0.017	.000	.959
Gender→Behavior (total indir)	0.044	-0.095	0.182	.014	.537
Gender→Behavior (total)	-0.140	-0.598	0.317	-.044	.548
Education→Attitude→Intention	0.029	-0.242	0.300	.007	.836
Education→SN→Intention	-0.015	-0.141	0.111	-.004	.812
Education→PBC→Intention	0.089	-0.012	0.191	.021	.084
Education→Intention (total indir)	0.103	-0.313	0.519	.025	.628
Education→Intention (total)	-0.136	-0.664	0.392	-.032	.614
Income→Attitude→Intention	-0.106	-0.349	0.136	-.025	.390
Income→SN→Intention	-0.030	-0.153	0.094	-.007	.636
Income→PBC→Intention	0.069	-0.024	0.161	.016	.145
Income→Intention (total indir)	-0.068	-0.447	0.311	-.016	.726
Income→Intention (total)	-0.069	-0.538	0.400	-.016	.772
Age→Attitude→Intention	-0.018	-0.037	0.000	-.065	.056
Age→SN→Intention	-0.008	-0.017	0.001	-.028	.088
Age→PBC→Intention	**-0.008**	**-0.015**	**0.000**	**-.028**	**.040**
Age→Intention (total indir)	**-0.033**	**-0.062**	**-0.005**	**-.121**	**.020**
Age→Intention (total)	**-0.044**	**-0.075**	**-0.013**	**-.159**	**.006**
Gender→Attitude→Intention	0.063	-0.190	0.316	.013	.625
Gender→SN→Intention	0.045	-0.093	0.182	.009	.522
Gender→PBC→Intention	-0.003	-0.105	0.100	-.001	.959
Gender→Intention (total indir)	0.105	-0.294	0.505	.022	.605
Gender→Intention (total)	0.178	-0.344	0.699	.036	.505
Attitude→Intention→Behavior	**0.143**	**0.073**	**0.213**	**.184**	**<.001**
SN→Intention→Behavior	**0.086**	**0.036**	**0.136**	**.095**	**.001**

PBC→Intention→Behavior	**0.065**	**0.027**	**0.103**	**.073**	**.001**
PBC→Behavior (total)	0.110	-0.012	0.232	.123	.078

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J3
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 3 (Familial Hypercholesterolemia Patient Physical Activity Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Attitude→Intention	**0.770**	**0.496**	**1.044**	**.498**	**<.001**
SN→Intention	0.161	-0.127	0.449	.106	.274
PBC→Intention	**0.392**	**0.105**	**0.680**	**.239**	**.007**
Education→Intention	0.066	-0.507	0.640	.020	.821
Income→Intention	0.491	-0.146	1.127	.161	.131
Age→Intention	0.001	-0.019	0.021	.011	.904
Gender→Intention	0.201	-0.243	0.646	.066	.374
Education→Attitude	0.001	-0.589	0.591	.000	.998
Income→Attitude	-0.099	-0.596	0.398	-.050	.696
Age→Attitude	-0.006	-0.019	0.007	-.085	.367
Gender→Attitude	0.064	-0.311	0.439	.033	.737
Education→SN	-0.065	-0.606	0.476	-.030	.813
Income→SN	0.187	-0.359	0.734	.093	.502
Age→SN	-0.009	-0.023	0.005	-.123	.203
Gender→SN	0.163	-0.226	0.553	.081	.412
Education→PBC	0.102	-0.321	0.526	.051	.635
Income→PBC	0.069	-0.391	0.530	.037	.768
Age→PBC	0.001	-0.011	0.013	.009	.922
Gender→PBC	0.248	-0.109	0.604	.134	.174
Correlations					
Attitude↔SN	**0.243**	**0.059**	**0.427**	**.255**	**.010**
Attitude↔PBC	**0.210**	**0.045**	**0.376**	**.239**	**.013**
SN↔PBC	**0.294**	**0.123**	**0.466**	**.331**	**.001**
Age↔Gender	0.154	-1.088	1.397	.023	.808
Education↔Age	-0.909	-2.281	0.462	-.145	.194
Income↔Age	**-1.507**	**-2.889**	**-0.124**	**-.222**	**.033**
Education↔Gender	0.007	-0.045	0.059	.031	.790
Income↔Gender	-0.057	-0.112	-0.002	-.232	.043
Education↔Income	**0.085**	**0.039**	**0.130**	**.376**	**<.001**
Indirect effects					
Education→Attitude→Intention	0.001	-0.454	0.455	.000	.998
Education→SN→Intention	-0.010	-0.099	0.078	-.003	.816
Education→PBC→Intention	0.040	-0.121	0.201	.012	.624
Education→Intention (total indir)	0.030	-0.523	0.584	.009	.914
Education→Intention (total)	0.097	-0.679	0.873	.029	.807
Income→Attitude→Intention	-0.076	-0.458	0.306	-.025	.695
Income→SN→Intention	0.030	-0.078	0.139	.010	.586
Income→PBC→Intention	0.027	-0.148	0.202	.009	.761
Income→Intention (total indir)	-0.019	-0.500	0.462	-.006	.938
Income→Intention (total)	0.472	-0.364	1.308	.155	.269

Age→Attitude→Intention	-0.005	-0.015	0.006	-.042	.371
Age→SN→Intention	-0.001	-0.005	0.002	-.013	.403
Age→PBC→Intention	0.000	-0.004	0.005	.002	.921
Age→Intention (total indir)	-0.006	-0.019	0.007	-.053	.386
Age→Intention (total)	-0.005	-0.027	0.018	-.042	.688
Gender→Attitude→Intention	0.050	-0.237	0.336	.016	.734
Gender→SN→Intention	0.026	-0.048	0.101	.009	.491
Gender→PBC→Intention	0.097	-0.069	0.264	.032	.253
Gender→Intention (total indir)	0.173	-0.221	0.567	.057	.390
Gender→Intention (total)	0.374	-0.196	0.945	.123	.198

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J4
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 4 (Adult Dental Flossing Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.685**	**0.544**	**0.827**	**.594**	**<.001**
PBC→Behavior	**0.349**	**0.105**	**0.592**	**.177**	**.005**
Education→Behavior	-0.304	-0.922	0.314	-.059	.335
Income→Behavior	0.040	-0.415	0.495	.009	.863
Age→Behavior	**0.035**	**0.018**	**0.053**	**.198**	**<.001**
Gender→Behavior	0.071	-0.479	0.621	.012	.800
Attitude→Intention	**0.716**	**0.518**	**0.914**	**.428**	**<.001**
SN→Intention	0.205	0.085	0.324	.169	.001
PBC→Intention	**0.586**	**0.433**	**0.738**	**.344**	**<.001**
Education→Intention	-0.275	-0.686	0.136	-.061	.190
Income→Intention	-0.111	-0.432	0.210	-.030	.499
Age→Intention	**0.018**	**0.004**	**0.033**	**.119**	**.014**
Gender→Intention	0.013	-0.469	0.496	.003	.958
Education→Attitude	0.003	-0.421	0.427	.001	.990
Income→Attitude	0.211	-0.093	0.515	.094	.174
Age→Attitude	0.012	-0.001	0.026	.132	.079
Gender→Attitude	0.267	-0.164	0.698	.089	.225
Education→SN	**0.537**	**0.008**	**1.066**	**.145**	**.047**
Income→SN	0.227	-0.169	0.623	.074	.261
Age→SN	-0.018	-0.036	0.000	-.140	.055
Gender→SN	-0.290	-0.722	0.142	-.070	.188
Education→PBC	-0.202	-0.579	0.175	-.077	.293
Income→PBC	0.249	-0.032	0.529	.113	.083
Age→PBC	0.004	-0.012	0.020	.043	.621
Gender→PBC	-0.197	-0.566	0.171	-.067	.293
Correlations					
Attitude↔SN	**0.715**	**0.460**	**0.969**	**.430**	**<.001**
Attitude↔PBC	**0.468**	**0.324**	**0.613**	**.395**	**<.001**
SN↔PBC	**0.360**	**0.149**	**0.571**	**.219**	**.001**
Age↔Gender	-0.259	-0.791	0.272	-.058	.339
Education↔Age	**2.315**	**1.799**	**2.832**	**.458**	**<.001**
Income↔Age	**1.550**	**0.836**	**2.264**	**.256**	**<.001**
Education↔Gender	-0.015	-0.031	0.001	-.097	.069
Income↔Gender	-0.004	-0.026	0.019	-.019	.752
Education↔Income	**0.039**	**0.014**	**0.063**	**.186**	**.002**
Indirect effects					
Education→Attitude→Intention→Behavior	0.001	-0.207	0.209	.000	.990
Education→SN→Intention→Behavior	0.075	-0.007	0.157	.015	.072
Education→PBC→Intention→Behavior	-0.081	-0.236	0.074	-.016	.304
Education→Intention→Behavior	-0.188	-0.470	0.093	-.036	.190

Education→PBC→Behavior	-0.071	-0.211	0.070	-.014	.326
Education→Behavior (total indir)	-0.263	-0.809	0.282	-.051	.344
Education→Behavior (total)	-0.567	-1.320	0.186	-.110	.140
Income→Attitude→Intention→Behavior	0.103	-0.052	0.259	.024	.193
Income→SN→Intention→Behavior	0.032	-0.028	0.091	.007	.294
Income→PBC→Intention→Behavior	0.100	-0.022	0.221	.023	.108
Income→Intention→Behavior	-0.076	-0.298	0.146	-.018	.503
Income→PBC→Behavior	0.087	-0.025	0.198	.020	.128
Income→Behavior (total indir)	0.246	-0.142	0.634	.057	.214
Income→Behavior (total)	0.286	-0.308	0.880	.066	.346
Age→Attitude→Intention→Behavior	0.006	-0.001	0.013	.034	.087
Age→SN→Intention→Behavior	-0.003	-0.006	0.001	-.014	.104
Age→PBC→Intention→Behavior	0.002	-0.005	0.008	.009	.622
Age→Intention→Behavior	0.013	0.002	0.023	.071	.017
Age→PBC→Behavior	0.001	-0.004	0.007	.008	.627
Age→Behavior (total indir)	**0.019**	**0.001**	**0.037**	**.107**	**.040**
Age→Behavior (total)	**0.054**	**0.032**	**0.077**	**.305**	**<.001**
Gender→Attitude→Intention→Behavior	0.131	-0.082	0.344	.023	.229
Gender→SN→Intention→Behavior	-0.041	-0.106	0.025	-.007	.223
Gender→PBC→Intention→Behavior	-0.079	-0.234	0.075	-.014	.315
Gender→Intention→Behavior	0.009	-0.322	0.340	.002	.958
Gender→PBC→Behavior	-0.069	-0.201	0.063	-.012	.308
Gender→Behavior (total indir)	-0.049	-0.549	0.451	-.008	.848
Gender→Behavior (total)	0.022	-0.763	0.807	.004	.956
Education→Attitude→Intention	0.002	-0.301	0.305	.000	.990
Education→SN→Intention	0.110	-0.012	0.231	.025	.077
Education→PBC→Intention	-0.118	-0.343	0.106	-.026	.302
Education→Intention (total indir)	-0.007	-0.520	0.507	-.001	.980
Education→Intention (total)	-0.281	-0.943	0.381	-.063	.405
Income→Attitude→Intention	0.151	-0.075	0.377	.040	.190
Income→SN→Intention	0.046	-0.040	0.132	.012	.289
Income→PBC→Intention	0.146	-0.030	0.321	.039	.103
Income→Intention (total indir)	0.343	-0.018	0.704	.092	.063
Income→Intention (total)	0.232	-0.239	0.704	.062	.334
Age→Attitude→Intention	0.009	-0.001	0.019	.057	.082
Age→SN→Intention	-0.004	-0.008	0.001	-.024	.103
Age→PBC→Intention	0.002	-0.007	0.011	.015	.622
Age→Intention (total indir)	0.007	-0.010	0.025	.048	.403
Age→Intention (total)	**0.026**	**0.005**	**0.046**	**.167**	**.015**
Gender→Attitude→Intention	0.191	-0.120	0.502	.038	.229
Gender→SN→Intention	-0.059	-0.154	0.035	-.012	.219
Gender→PBC→Intention	-0.116	-0.338	0.106	-.023	.308
Gender→Intention (total indir)	0.016	-0.476	0.508	.003	.949
Gender→Intention (total)	0.029	-0.601	0.659	.006	.928
Attitude→Intention→Behavior	**0.491**	**0.325**	**0.656**	**.254**	**<.001**
SN→Intention→Behavior	**0.140**	**0.054**	**0.226**	**.100**	**.001**

PBC→Intention→Behavior	**0.401**	**0.269**	**0.534**	**.204**	**<.001**
PBC→Behavior (total)	**0.750**	**0.528**	**0.972**	**.381**	**<.001**

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J5
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 5 (Student Heavy Episodic Drinking Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.366**	**0.247**	**0.486**	**.483**	**<.001**
PBC→Behavior	-0.169	-0.456	0.118	-.119	.248
Education→Behavior	0.039	-0.389	0.467	.013	.859
Income→Behavior	-0.243	-0.644	0.158	-.082	.235
Age→Behavior	0.016	-0.076	0.108	.024	.730
Gender→Behavior	0.077	-0.343	0.497	.025	.719
Attitude→Intention	**0.674**	**0.534**	**0.814**	**.533**	**<.001**
SN→Intention	0.129	-0.023	0.281	.105	.095
PBC→Intention	**0.295**	**0.078**	**0.512**	**.157**	**.008**
Education→Intention	-0.222	-0.704	0.259	-.056	.366
Income→Intention	0.354	-0.032	0.739	.090	.072
Age→Intention	0.031	-0.076	0.138	.035	.576
Gender→Intention	-0.385	-0.835	0.065	-.095	.093
Education→Attitude	0.277	-0.210	0.764	.088	.265
Income→Attitude	0.015	-0.403	0.434	.005	.942
Age→Attitude	0.030	-0.083	0.144	.044	.600
Gender→Attitude	-0.267	-0.694	0.159	-.083	.219
Education→SN	0.267	-0.237	0.770	.082	.299
Income→SN	0.058	-0.365	0.482	.018	.787
Age→SN	0.068	-0.046	0.181	.094	.242
Gender→SN	-0.376	-0.830	0.079	-.113	.105
Education→PBC	0.045	-0.269	0.359	.021	.778
Income→PBC	0.039	-0.253	0.331	.019	.793
Age→PBC	-0.008	-0.072	0.056	-.017	.809
Gender→PBC	**-0.390**	**-0.649**	**-0.132**	**-.181**	**.003**
Correlations					
Attitude↔SN	**1.177**	**0.872**	**1.483**	**.528**	**<.001**
Attitude↔PBC	**0.387**	**0.173**	**0.602**	**.266**	**<.001**
SN↔PBC	**0.219**	**0.001**	**0.436**	**.147**	**.049**
Age↔Gender	**-0.151**	**-0.298**	**-0.004**	**-.152**	**.044**
Education↔Age	**0.454**	**0.317**	**0.591**	**.450**	**<.001**
Income↔Age	-0.103	-0.241	0.034	-.100	.140
Education↔Gender	0.011	-0.018	0.041	.052	.448
Income↔Gender	0.006	-0.025	0.036	.026	.709
Education↔Income	-0.030	-0.060	0.000	-.133	.052
Indirect effects					
Education→Attitude→Intention→Behavior	0.068	-0.055	0.192	.023	.279
Education→SN→Intention→Behavior	0.013	-0.015	0.040	.004	.366
Education→PBC→Intention→Behavior	0.005	-0.029	0.039	.002	.779
Education→Intention→Behavior	-0.081	-0.262	0.099	-.027	.375

Education→PBC→Behavior	-0.008	-0.064	0.048	-.003	.788
Education→Behavior (total indir)	-0.003	-0.220	0.213	-.001	.977
Education→Behavior (total)	0.036	-0.436	0.507	.012	.882
Income→Attitude→Intention→Behavior	0.004	-0.100	0.107	.001	.942
Income→SN→Intention→Behavior	0.003	-0.017	0.023	.001	.788
Income→PBC→Intention→Behavior	0.004	-0.027	0.035	.001	.789
Income→Intention→Behavior	0.130	-0.018	0.277	.044	.085
Income→PBC→Behavior	-0.007	-0.056	0.042	-.002	.791
Income→Behavior (total indir)	0.134	-0.051	0.318	.045	.155
Income→Behavior (total)	-0.109	-0.546	0.327	-.037	.624
Age→Attitude→Intention→Behavior	0.008	-0.021	0.036	.011	.604
Age→SN→Intention→Behavior	0.003	-0.004	0.010	.005	.368
Age→PBC→Intention→Behavior	-0.001	-0.008	0.006	-.001	.807
Age→Intention→Behavior	0.011	-0.028	0.050	.017	.576
Age→PBC→Behavior	0.001	-0.010	0.012	.002	.810
Age→Behavior (total indir)	0.022	-0.029	0.074	.034	.396
Age→Behavior (total)	0.039	-0.071	0.148	.058	.491
Gender→Attitude→Intention→Behavior	-0.066	-0.177	0.045	-.021	.243
Gender→SN→Intention→Behavior	-0.018	-0.047	0.012	-.006	.240
Gender→PBC→Intention→Behavior	-0.042	-0.089	0.005	-.014	.079
Gender→Intention→Behavior	-0.141	-0.309	0.027	-.046	.099
Gender→PBC→Behavior	0.066	-0.053	0.185	.021	.278
Gender→Behavior (total indir)	-0.201	-0.418	0.015	-.065	.069
Gender→Behavior (total)	-0.124	-0.578	0.330	-.040	.593
Education→Attitude→Intention	0.187	-0.144	0.518	.047	.268
Education→SN→Intention	0.034	-0.039	0.107	.009	.356
Education→PBC→Intention	0.013	-0.080	0.106	.003	.779
Education→Intention (total indir)	0.235	-0.175	0.644	.059	.261
Education→Intention (total)	0.012	-0.611	0.636	.003	.969
Income→Attitude→Intention	0.010	-0.272	0.293	.003	.942
Income→SN→Intention	0.008	-0.047	0.062	.002	.788
Income→PBC→Intention	0.012	-0.073	0.096	.003	.788
Income→Intention (total indir)	0.030	-0.320	0.379	.008	.869
Income→Intention (total)	0.383	-0.138	0.904	.098	.150
Age→Attitude→Intention	0.021	-0.056	0.097	.023	.600
Age→SN→Intention	0.009	-0.010	0.027	.010	.360
Age→PBC→Intention	-0.002	-0.021	0.016	-.003	.806
Age→Intention (total indir)	0.027	-0.068	0.122	.031	.578
Age→Intention (total)	0.057	-0.089	0.204	.065	.441
Gender→Attitude→Intention	-0.180	-0.476	0.116	-.044	.233
Gender→SN→Intention	-0.048	-0.127	0.030	-.012	.226
Gender→PBC→Intention	-0.115	-0.240	0.010	-.028	.070
Gender→Intention (total indir)	-0.344	-0.699	0.011	-.085	.058
Gender→Intention (total)	**-0.729**	**-1.282**	**-0.176**	**-.179**	**.010**
Attitude→Intention→Behavior	**0.247**	**0.147**	**0.348**	**.258**	**<.001**
SN→Intention→Behavior	0.047	-0.012	0.106	.051	.115

PBC→Intention→Behavior	**0.108**	**0.022**	**0.194**	**.076**	**.014**
PBC→Behavior (total)	-0.061	-0.304	0.182	-.043	.622

Note. B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control.

Table J6
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 6 (Older Adults' Physical Activity Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.472**	**0.306**	**0.638**	**.554**	**<.001**
PBC→Behavior	0.076	-0.164	0.316	.069	.535
Education→Behavior	-0.164	-0.539	0.210	-.056	.389
Income→Behavior	-0.108	-0.551	0.334	-.035	.632
Age→Behavior	0.021	-0.005	0.047	.103	.109
Gender→Behavior	0.039	-0.390	0.468	.013	.858
Attitude→Intention	**0.356**	**0.192**	**0.521**	**.310**	**<.001**
SN→Intention	0.063	-0.053	0.180	.057	.286
PBC→Intention	**0.683**	**0.492**	**0.874**	**.527**	**<.001**
Education→Intention	0.092	-0.220	0.403	.027	.564
Income→Intention	-0.028	-0.364	0.309	-.008	.872
Age→Intention	-0.009	-0.033	0.016	-.037	.489
Gender→Intention	-0.145	-0.471	0.181	-.040	.384
Education→Attitude	**0.514**	**0.079**	**0.949**	**.173**	**.021**
Income→Attitude	0.327	-0.041	0.696	.105	.082
Age→Attitude	**-0.035**	**-0.068**	**-0.001**	**-.168**	**.042**
Gender→Attitude	0.371	-0.080	0.822	.118	.107
Education→SN	0.172	-0.275	0.618	.056	.451
Income→SN	**0.476**	**0.075**	**0.878**	**.148**	**.020**
Age→SN	-0.014	-0.045	0.018	-.064	.395
Gender→SN	-0.217	-0.645	0.210	-.067	.319
Education→PBC	**0.378**	**0.014**	**0.742**	**.143**	**.042**
Income→PBC	**0.350**	**0.020**	**0.679**	**.127**	**.037**
Age→PBC	**-0.036**	**-0.062**	**-0.010**	**-.198**	**.006**
Gender→PBC	-0.013	-0.391	0.366	-.004	.948
Correlations					
Attitude↔SN	**0.536**	**0.228**	**0.843**	**.258**	**.001**
Attitude↔PBC	**0.793**	**0.445**	**1.140**	**.459**	**<.001**
SN↔PBC	**0.453**	**0.126**	**0.779**	**.247**	**.007**
Age↔Gender	-0.028	-0.470	0.414	-.009	.900
Education↔Age	-0.355	-0.847	0.136	-.102	.157
Income↔Age	**-0.735**	**-1.176**	**-0.294**	**-.220**	**.001**
Education↔Gender	**-0.041**	**-0.071**	**-0.012**	**-.181**	**.007**
Income↔Gender	**-0.042**	**-0.074**	**-0.010**	**-.193**	**.009**
Education↔Income	0.025	-0.007	0.057	.108	.123
Indirect effects					
Education→Attitude→Intention→Behavior	0.086	-0.004	0.177	.030	.062
Education→SN→Intention→Behavior	0.005	-0.013	0.023	.002	.570
Education→PBC→Intention→Behavior	0.122	-0.007	0.251	.042	.065
Education→Intention→Behavior	0.043	-0.104	0.190	.015	.564

Education→PBC→Behavior	0.029	-0.068	0.125	.010	.559
Education→Behavior (total indir)	**0.285**	**0.027**	**0.544**	**.098**	**.030**
Education→Behavior (total)	0.121	-0.323	0.565	.042	.593
Income→Attitude→Intention→Behavior	0.055	-0.012	0.122	.018	.105
Income→SN→Intention→Behavior	0.014	-0.016	0.045	.005	.363
Income→PBC→Intention→Behavior	**0.113**	**0.003**	**0.222**	**.037**	**.044**
Income→Intention→Behavior	-0.013	-0.172	0.146	-.004	.872
Income→PBC→Behavior	0.027	-0.067	0.121	.009	.579
Income→Behavior (total indir)	0.196	-0.053	0.444	.064	.124
Income→Behavior (total)	0.087	-0.417	0.592	.029	.734
Age→Attitude→Intention→Behavior	-0.006	-0.012	0.001	-.029	.078
Age→SN→Intention→Behavior	0.000	-0.002	0.001	-.002	.506
Age→PBC→Intention→Behavior	**-0.012**	**-0.022**	**-0.001**	**-.058**	**.025**
Age→Intention→Behavior	-0.004	-0.016	0.008	-.020	.494
Age→PBC→Behavior	-0.003	-0.011	0.006	-.014	.529
Age→Behavior (total indir)	**-0.025**	**-0.042**	**-0.008**	**-.123**	**.005**
Age→Behavior (total)	-0.004	-0.033	0.025	-.019	.797
Gender→Attitude→Intention→Behavior	0.062	-0.021	0.146	.020	.144
Gender→SN→Intention→Behavior	-0.007	-0.024	0.011	-.002	.478
Gender→PBC→Intention→Behavior	-0.004	-0.126	0.118	-.001	.948
Gender→Intention→Behavior	-0.068	-0.221	0.084	-.022	.380
Gender→PBC→Behavior	-0.001	-0.029	0.027	.000	.947
Gender→Behavior (total indir)	-0.017	-0.268	0.233	-.006	.891
Gender→Behavior (total)	0.022	-0.498	0.542	.007	.935
Education→Attitude→Intention	**0.183**	**0.007**	**0.359**	**.054**	**.042**
Education→SN→Intention	0.011	-0.026	0.048	.003	.568
Education→PBC→Intention	**0.258**	**0.002**	**0.514**	**.076**	**.048**
Education→Intention (total indir)	**0.452**	**0.092**	**0.812**	**.132**	**.014**
Education→Intention (total)	**0.544**	**0.076**	**1.011**	**.159**	**.023**
Income→Attitude→Intention	0.117	-0.021	0.254	.033	.097
Income→SN→Intention	0.030	-0.033	0.094	.008	.352
Income→PBC→Intention	**0.239**	**0.010**	**0.467**	**.067**	**.040**
Income→Intention (total indir)	**0.386**	**0.072**	**0.699**	**.108**	**.016**
Income→Intention (total)	0.358	-0.107	0.823	.100	.131
Age→Attitude→Intention	-0.012	-0.025	0.001	-.052	.060
Age→SN→Intention	-0.001	-0.003	0.002	-.004	.499
Age→PBC→Intention	**-0.025**	**-0.045**	**-0.005**	**-.104**	**.015**
Age→Intention (total indir)	**-0.038**	**-0.065**	**-0.011**	**-.160**	**.006**
Age→Intention (total)	**-0.047**	**-0.080**	**-0.013**	**-.197**	**.006**
Gender→Attitude→Intention	0.132	-0.037	0.302	.037	.126
Gender→SN→Intention	-0.014	-0.052	0.024	-.004	.475
Gender→PBC→Intention	-0.009	-0.267	0.250	-.002	.948
Gender→Intention (total indir)	0.110	-0.270	0.489	.030	.570
Gender→Intention (total)	-0.035	-0.525	0.455	-.010	.889
Attitude→Intention→Behavior	**0.168**	**0.071**	**0.265**	**.172**	**.001**
SN→Intention→Behavior	0.030	-0.026	0.086	.032	.298

PBC→Intention→Behavior	**0.322**	**0.177**	**0.468**	**.292**	**<.001**
PBC→Behavior (total)	**0.398**	**0.196**	**0.600**	**.361**	**<.001**

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J7

Parameter Estimates Coefficients and 95% Confidence Intervals for the Path Analytic Model from Dataset 7 (Parent-for-Child Sun Safety Behaviors Sample 2)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.745**	**0.499**	**0.990**	**.416**	**<.001**
PBC→Behavior	**0.204**	**0.035**	**0.373**	**.152**	**.018**
Education→Behavior	**0.560**	**0.064**	**1.057**	**.199**	**.027**
Income→Behavior	-0.159	-0.518	0.200	-.052	.385
Age→Behavior	**0.030**	**0.002**	**0.058**	**.121**	**.033**
Gender→Behavior	0.062	-0.300	0.424	.017	.738
Attitude→Intention	**0.281**	**0.200**	**0.361**	**.400**	**<.001**
SN→Intention	**0.232**	**0.140**	**0.324**	**.236**	**<.001**
PBC→Intention	**0.143**	**0.065**	**0.221**	**.191**	**<.001**
Education→Intention	-0.022	-0.171	0.127	-.014	.776
Income→Intention	0.033	-0.104	0.170	.019	.638
Age→Intention	-0.007	-0.018	0.004	-.048	.235
Gender→Intention	0.166	-0.006	0.338	.080	.058
Education→Attitude	0.039	-0.277	0.355	.017	.810
Income→Attitude	-0.160	-0.429	0.110	-.066	.245
Age→Attitude	-0.018	-0.041	0.005	-.089	.129
Gender→Attitude	-0.027	-0.321	0.268	-.009	.859
Education→SN	0.051	-0.162	0.264	.032	.640
Income→SN	-0.049	-0.246	0.148	-.028	.628
Age→SN	-0.004	-0.019	0.012	-.026	.647
Gender→SN	0.020	-0.207	0.247	.010	.861
Education→PBC	-0.101	-0.347	0.145	-.048	.421
Income→PBC	**-0.295**	**-0.510**	**-0.081**	**-.130**	**.007**
Age→PBC	**-0.030**	**-0.047**	**-0.013**	**-.159**	**.001**
Gender→PBC	0.200	-0.094	0.494	.072	.183
Correlations					
Attitude↔SN	**0.271**	**0.175**	**0.367**	**.329**	**<.001**
Attitude↔PBC	**0.335**	**0.207**	**0.464**	**.322**	**<.001**
SN↔PBC	**0.250**	**0.156**	**0.345**	**.336**	**<.001**
Age↔Gender	**-0.527**	**-0.753**	**-0.301**	**-.268**	**<.001**
Education↔Age	0.289	-0.088	0.666	.112	.133
Income↔Age	**0.636**	**0.367**	**0.905**	**.265**	**<.001**
Education↔Gender	-0.007	-0.026	0.013	-.038	.497
Income↔Gender	**-0.032**	**-0.045**	**-0.020**	**-.199**	**<.001**
Education↔Income	0.032	-0.001	0.066	.152	.059
Indirect effects					
Education→Attitude→Intention→Behavior	0.008	-0.058	0.074	.003	.810
Education→SN→Intention→Behavior	0.009	-0.028	0.046	.003	.643
Education→PBC→Intention→Behavior	-0.011	-0.038	0.016	-.004	.439
Education→Intention→Behavior	-0.016	-0.128	0.095	-.006	.777

Education→PBC→Behavior	-0.021	-0.075	0.034	-.007	.463
Education→Behavior (total indir)	-0.030	-0.213	0.152	-.011	.743
Education→Behavior (total)	0.530	-0.021	1.081	.188	.059
Income→Attitude→Intention→Behavior	-0.033	-0.092	0.025	-.011	.266
Income→SN→Intention→Behavior	-0.008	-0.043	0.026	-.003	.633
Income→PBC→Intention→Behavior	**-0.031**	**-0.062**	**-0.001**	**-.010**	**.045**
Income→Intention→Behavior	0.024	-0.078	0.127	.008	.640
Income→PBC→Behavior	-0.060	-0.128	0.008	-.020	.082
Income→Behavior (total indir)	-0.109	-0.272	0.054	-.036	.190
Income→Behavior (total)	-0.268	-0.643	0.107	-.088	.161
Age→Attitude→Intention→Behavior	-0.004	-0.009	0.001	-.015	.158
Age→SN→Intention→Behavior	-0.001	-0.003	0.002	-.003	.649
Age→PBC→Intention→Behavior	**-0.003**	**-0.006**	**-0.001**	**-.013**	**.014**
Age→Intention→Behavior	-0.005	-0.013	0.004	-.020	.253
Age→PBC→Behavior	-0.006	-0.012	0.000	-.024	.056
Age→Behavior (total indir)	**-0.019**	**-0.032**	**-0.005**	**-.074**	**.008**
Age→Behavior (total)	0.012	-0.019	0.043	.047	.453
Gender→Attitude→Intention→Behavior	-0.006	-0.067	0.056	-.001	.860
Gender→SN→Intention→Behavior	0.004	-0.036	0.043	.001	.862
Gender→PBC→Intention→Behavior	0.021	-0.015	0.058	.006	.256
Gender→Intention→Behavior	0.124	-0.011	0.259	.033	.072
Gender→PBC→Behavior	0.041	-0.027	0.108	.011	.235
Gender→Behavior (total indir)	0.184	-0.033	0.400	.050	.096
Gender→Behavior (total)	0.246	-0.197	0.688	.066	.276
Education→Attitude→Intention	0.011	-0.078	0.100	.007	.811
Education→SN→Intention	0.012	-0.038	0.062	.008	.644
Education→PBC→Intention	-0.014	-0.051	0.022	-.009	.438
Education→Intention (total indir)	0.008	-0.129	0.145	.005	.906
Education→Intention (total)	-0.013	-0.221	0.194	-.008	.900
Income→Attitude→Intention	-0.045	-0.123	0.033	-.026	.261
Income→SN→Intention	-0.011	-0.058	0.035	-.007	.632
Income→PBC→Intention	**-0.042**	**-0.080**	**-0.004**	**-.025**	**.031**
Income→Intention (total indir)	-0.098	-0.217	0.021	-.058	.105
Income→Intention (total)	-0.065	-0.242	0.112	-.039	.469
Age→Attitude→Intention	-0.005	-0.012	0.002	-.035	.146
Age→SN→Intention	-0.001	-0.005	0.003	-.006	.648
Age→PBC→Intention	**-0.004**	**-0.007**	**-0.001**	**-.030**	**.007**
Age→Intention (total indir)	**-0.010**	**-0.020**	**0.000**	**-.072**	**.048**
Age→Intention (total)	**-0.017**	**-0.032**	**-0.002**	**-.119**	**.026**
Gender→Attitude→Intention	-0.007	-0.090	0.075	-.004	.860
Gender→SN→Intention	0.005	-0.048	0.058	.002	.862
Gender→PBC→Intention	0.029	-0.019	0.076	.014	.240
Gender→Intention (total indir)	0.026	-0.115	0.167	.012	.720
Gender→Intention (total)	0.192	-0.043	0.427	.093	.109
Attitude→Intention→Behavior	**0.209**	**0.117**	**0.300**	**.167**	**<.001**
SN→Intention→Behavior	**0.173**	**0.083**	**0.263**	**.098**	**<.001**

PBC→Intention→Behavior	**0.106**	**0.037**	**0.176**	**.079**	**.003**
PBC→Behavior (total)	**0.310**	**0.151**	**0.469**	**.231**	**<.001**

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J8
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 8 (Parent-for-Child Swimming Pool Safety Behaviors National Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Attitude→Intention	**0.129**	**0.048**	**0.210**	**.152**	**.002**
SN→Intention	**0.497**	**0.368**	**0.626**	**.473**	**<.001**
PBC→Intention	**0.300**	**0.167**	**0.433**	**.281**	**<.001**
Education→Intention	-0.048	-0.154	0.058	-.022	.375
Income→Intention	-0.011	-0.109	0.088	-.005	.831
Age→Intention	**0.006**	**0.001**	**0.011**	**.054**	**.023**
Gender→Intention	0.081	-0.065	0.228	.036	.274
Education→Attitude	-0.122	-0.348	0.104	-.048	.289
Income→Attitude	**0.265**	**0.070**	**0.459**	**.115**	**.008**
Age→Attitude	0.012	0.000	0.023	.088	.052
Gender→Attitude	**0.688**	**0.446**	**0.931**	**.260**	**<.001**
Education→SN	-0.119	-0.280	0.042	-.058	.146
Income→SN	**0.153**	**0.007**	**0.299**	**.082**	**.041**
Age→SN	**0.020**	**0.013**	**0.028**	**.193**	**<.001**
Gender→SN	**0.810**	**0.595**	**1.026**	**.380**	**<.001**
Education→PBC	**-0.205**	**-0.363**	**-0.046**	**-.101**	**.011**
Income→PBC	0.113	-0.036	0.262	.062	.138
Age→PBC	**0.016**	**0.009**	**0.024**	**.157**	**<.001**
Gender→PBC	**0.632**	**0.435**	**0.830**	**.300**	**<.001**
Correlations					
Attitude↔SN	**0.468**	**0.341**	**0.595**	**.496**	**<.001**
Attitude↔PBC	**0.482**	**0.353**	**0.611**	**.503**	**<.001**
SN↔PBC	**0.591**	**0.452**	**0.731**	**.802**	**<.001**
Age↔Gender	**-0.852**	**-1.241**	**-0.464**	**-.224**	**<.001**
Education↔Age	0.163	-0.191	0.518	.041	.367
Income↔Age	**0.393**	**0.014**	**0.771**	**.090**	**.042**
Education↔Gender	**-0.021**	**-0.037**	**-0.005**	**-.105**	**.011**
Income↔Gender	**-0.027**	**-0.046**	**-0.009**	**-.125**	**.004**
Education↔Income	**0.050**	**0.031**	**0.069**	**.223**	**<.001**
Indirect effects					
Education→Attitude→Intention	-0.016	-0.048	0.016	-.007	.332
Education→SN→Intention	-0.059	-0.137	0.019	-.027	.138
Education→PBC→Intention	**-0.061**	**-0.119**	**-0.004**	**-.028**	**.036**
Education→Intention (total indir)	-0.136	-0.275	0.002	-.063	.053
Education→Intention (total)	**-0.184**	**-0.354**	**-0.015**	**-.085**	**.033**
Income→Attitude→Intention	**0.034**	**0.008**	**0.060**	**.018**	**.010**
Income→SN→Intention	**0.076**	**0.000**	**0.152**	**.039**	**.049**
Income→PBC→Intention	0.034	-0.014	0.081	.017	.164
Income→Intention (total indir)	**0.144**	**0.019**	**0.269**	**.074**	**.024**
Income→Intention (total)	0.133	-0.023	0.290	.068	.095

Age→Attitude→Intention	0.001	0.000	0.003	.013	.140
Age→SN→Intention	**0.010**	**0.005**	**0.015**	**.091**	**<.001**
Age→PBC→Intention	**0.005**	**0.002**	**0.008**	**.044**	**.002**
Age→Intention (total indir)	**0.017**	**0.010**	**0.023**	**.149**	**<.001**
Age→Intention (total)	**0.023**	**0.015**	**0.031**	**.203**	**<.001**
Gender→Attitude→Intention	**0.089**	**0.025**	**0.153**	**.040**	**.006**
Gender→SN→Intention	**0.403**	**0.245**	**0.561**	**.179**	**<.001**
Gender→PBC→Intention	**0.190**	**0.082**	**0.297**	**.084**	**.001**
Gender→Intention (total indir)	**0.681**	**0.488**	**0.874**	**.304**	**<.001**
Gender→Intention (total)	**0.763**	**0.545**	**0.981**	**.340**	**<.001**

Note. Parameter estimates in boldface are statistically significant ($p < .05$). Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J9
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model Dataset 9 (Parent-for-Child Swim Swimming Pool Safety Behaviors Regional Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Attitude→Intention	**0.140**	**0.032**	**0.249**	**.137**	**.011**
SN→Intention	**0.400**	**0.194**	**0.606**	**.405**	**<.001**
PBC→Intention	**0.394**	**0.203**	**0.584**	**.390**	**<.001**
Education→Intention	0.130	-0.051	0.311	.041	.159
Income→Intention	-0.024	-0.125	0.077	-.010	.646
Age→Intention	**0.007**	**0.000**	**0.014**	**.054**	**.043**
Gender→Intention	0.028	-0.071	0.126	.012	.582
Education→Attitude	-0.013	-0.296	0.269	-.004	.927
Income→Attitude	**0.202**	**0.008**	**0.396**	**.089**	**.041**
Age→Attitude	**0.018**	**0.008**	**0.029**	**.148**	**.001**
Gender→Attitude	**0.455**	**0.265**	**0.645**	**.202**	**<.001**
Education→SN	0.000	-0.325	0.326	.000	.998
Income→SN	0.137	-0.066	0.340	.058	.186
Age→SN	**0.017**	**0.005**	**0.030**	**.135**	**.007**
Gender→SN	**0.385**	**0.185**	**0.585**	**.164**	**<.001**
Education→PBC	-0.173	-0.448	0.102	-.055	.218
Income→PBC	0.197	-0.005	0.400	.085	.056
Age→PBC	**0.019**	**0.008**	**0.029**	**.149**	**.001**
Gender→PBC	**0.403**	**0.210**	**0.595**	**.176**	**<.001**
Correlations					
Attitude↔SN	**0.881**	**0.713**	**1.049**	**.713**	**<.001**
Attitude↔PBC	**0.827**	**0.647**	**1.006**	**.690**	**<.001**
SN↔PBC	**1.016**	**0.844**	**1.188**	**.808**	**<.001**
Age↔Gender	**-0.392**	**-0.779**	**-0.005**	**-.087**	**.047**
Education↔Age	**0.400**	**0.062**	**0.739**	**.121**	**.021**
Income↔Age	**1.009**	**0.630**	**1.387**	**.225**	**<.001**
Education↔Gender	**-0.015**	**-0.031**	**0.000**	**-.084**	**.049**
Income↔Gender	-0.004	-0.025	0.017	-.015	.737
Education↔Income	**0.028**	**0.012**	**0.043**	**.152**	**.001**
Indirect effects					
Education→Attitude→Intention	-0.002	-0.042	0.038	-.001	.927
Education→SN→Intention	0.000	-0.130	0.130	.000	.998
Education→PBC→Intention	-0.068	-0.176	0.040	-.022	.219
Education→Intention (total indir)	-0.070	-0.321	0.181	-.022	.586
Education→Intention (total)	0.060	-0.258	0.379	.019	.710
Income→Attitude→Intention	0.028	-0.006	0.063	.012	.107
Income→SN→Intention	0.055	-0.032	0.141	.023	.215
Income→PBC→Intention	0.078	-0.016	0.171	.033	.103
Income→Intention (total indir)	0.161	-0.016	0.338	.069	.075
Income→Intention (total)	0.137	-0.066	0.340	.059	.186

Age→Attitude→Intention	0.003	0.000	0.005	.020	.054
Age→SN→Intention	0.007	0.000	0.014	.055	.059
Age→PBC→Intention	**0.007**	**0.002**	**0.012**	**.058**	**.004**
Age→Intention (total indir)	**0.017**	**0.008**	**0.026**	**.133**	**<.001**
Age→Intention (total)	**0.024**	**0.014**	**0.034**	**.187**	**<.001**
Gender→Attitude→Intention	**0.064**	**0.005**	**0.122**	**.028**	**.033**
Gender→SN→Intention	**0.154**	**0.034**	**0.274**	**.067**	**.012**
Gender→PBC→Intention	**0.158**	**0.043**	**0.274**	**.069**	**.007**
Gender→Intention (total indir)	**0.376**	**0.198**	**0.554**	**.163**	**<.001**
Gender→Intention (total)	**0.403**	**0.209**	**0.598**	**.175**	**<.001**

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J10
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 10 (Pregnant Women Physical Activity Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.586**	**0.392**	**0.779**	**.547**	**<.001**
PBC→Behavior	0.244	-0.006	0.494	.165	.056
Education→Behavior	0.532	-0.308	1.372	.116	.215
Income→Behavior	-0.047	-0.554	0.460	-.013	.855
Age→Behavior	-0.014	-0.066	0.038	-.034	.601
Attitude→Intention	**0.682**	**0.510**	**0.854**	**.510**	**<.001**
SN→Intention	-0.029	-0.154	0.095	-.023	.644
PBC→Intention	**0.596**	**0.434**	**0.758**	**.430**	**<.001**
Education→Intention	-0.011	-0.348	0.325	-.003	.947
Income→Intention	0.009	-0.284	0.301	.003	.953
Age→Intention	-0.014	-0.050	0.022	-.036	.458
Education→Attitude	0.383	-0.117	0.883	.119	.133
Income→Attitude	0.009	-0.385	0.402	.003	.965
Age→Attitude	0.024	-0.019	0.066	.083	.277
Education→SN	0.381	-0.141	0.904	.112	.152
Income→SN	-0.201	-0.579	0.178	-.072	.298
Age→SN	0.024	-0.024	0.071	.079	.326
Education→PBC	-0.132	-0.551	0.288	-.042	.538
Income→PBC	-0.075	-0.440	0.290	-.030	.688
Age→PBC	-0.033	-0.070	0.005	-.120	.087
Correlations					
Attitude↔SN	**0.837**	**0.505**	**1.169**	**.501**	**<.001**
Attitude↔PBC	**0.843**	**0.619**	**1.067**	**.556**	**<.001**
SN↔PBC	**0.611**	**0.359**	**0.864**	**.378**	**<.001**
Education↔Age	**0.452**	**0.185**	**0.719**	**.255**	**.001**
Income↔Age	**0.648**	**0.353**	**0.943**	**.297**	**<.001**
Education↔Income	**0.057**	**0.029**	**0.085**	**.296**	**<.001**
Indirect effects					
Education→Attitude→Intention→Behavior	0.153	-0.049	0.355	.033	.138
Education→SN→Intention→Behavior	-0.007	-0.036	0.023	-.001	.658
Education→PBC→Intention→Behavior	-0.046	-0.193	0.101	-.010	.541
Education→Intention→Behavior	-0.007	-0.204	0.190	-.001	.947
Education→PBC→Behavior	-0.032	-0.140	0.076	-.007	.560
Education→Behavior (total indir)	0.062	-0.395	0.519	.013	.791
Education→Behavior (total)	0.593	-0.401	1.588	.129	.242
Income→Attitude→Intention→Behavior	0.003	-0.154	0.161	.001	.965
Income→SN→Intention→Behavior	0.003	-0.012	0.019	.001	.667
Income→PBC→Intention→Behavior	-0.026	-0.153	0.100	-.007	.686
Income→Intention→Behavior	0.005	-0.166	0.176	.001	.953
Income→PBC→Behavior	-0.018	-0.111	0.074	-.005	.698

Income→Behavior (total indir)	-0.032	-0.408	0.344	-.009	.866
Income→Behavior (total)	-0.079	-0.717	0.558	-.021	.807
Age→Attitude→Intention→Behavior	0.009	-0.008	0.027	.023	.296
Age→SN→Intention→Behavior	0.000	-0.002	0.001	-.001	.658
Age→PBC→Intention→Behavior	-0.011	-0.026	0.003	-.028	.133
Age→Intention→Behavior	-0.008	-0.029	0.013	-.020	.447
Age→PBC→Behavior	-0.008	-0.020	0.004	-.020	.175
Age→Behavior (total indir)	-0.018	-0.063	0.026	-.046	.413
Age→Behavior (total)	-0.032	-0.100	0.036	-.080	.351
Education→Attitude→Intention	0.261	-0.078	0.601	.061	.131
Education→SN→Intention	-0.011	-0.061	0.038	-.003	.656
Education→PBC→Intention	-0.078	-0.329	0.172	-.018	.540
Education→Intention (total indir)	0.172	-0.359	0.702	.040	.526
Education→Intention (total)	0.160	-0.473	0.793	.037	.620
Income→Attitude→Intention	0.006	-0.262	0.274	.002	.965
Income→SN→Intention	0.006	-0.021	0.033	.002	.666
Income→PBC→Intention	-0.045	-0.261	0.172	-.013	.686
Income→Intention (total indir)	-0.033	-0.454	0.389	-.009	.879
Income→Intention (total)	-0.024	-0.544	0.496	-.007	.928
Age→Attitude→Intention	0.016	-0.013	0.046	.043	.285
Age→SN→Intention	-0.001	-0.004	0.002	-.002	.655
Age→PBC→Intention	-0.020	-0.043	0.004	-.052	.106
Age→Intention (total indir)	-0.004	-0.049	0.041	-.011	.858
Age→Intention (total)	-0.018	-0.081	0.045	-.047	.579
Attitude→Intention→Behavior	**0.399**	**0.241**	**0.558**	**.279**	**<.001**
SN→Intention→Behavior	-0.017	-0.091	0.056	-.013	.646
PBC→Intention→Behavior	**0.349**	**0.190**	**0.508**	**.236**	**<.001**
PBC→Behavior (total)	**0.593**	**0.404**	**0.782**	**.400**	**<.001**

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J11
Parameter Estimates Coefficients and 95% Confidence Intervals for the Path Analytic Model from Dataset 11 (Student Alcohol Consumption Within Safe Limits Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.473**	**0.282**	**0.664**	**.387**	**<.001**
PBC→Behavior	0.232	-0.076	0.540	.110	.140
Education→Behavior	-0.097	-0.926	0.732	-.020	.819
Income→Behavior	0.275	-0.328	0.877	.060	.371
Age→Behavior	0.048	-0.045	0.142	.078	.313
Gender→Behavior	0.099	-0.610	0.807	.020	.785
Attitude→Intention	**0.230**	**0.015**	**0.445**	**.177**	**.036**
SN→Intention	**0.561**	**0.347**	**0.775**	**.388**	**<.001**
PBC→Intention	0.034	-0.219	0.287	.020	.794
Education→Intention	0.324	-0.093	0.741	.083	.128
Income→Intention	-0.044	-0.439	0.350	-.012	.826
Age→Intention	0.029	-0.023	0.081	.057	.277
Gender→Intention	0.358	-0.048	0.764	.090	.084
Education→Attitude	0.154	-0.245	0.553	.052	.450
Income→Attitude	0.163	-0.181	0.506	.056	.353
Age→Attitude	0.014	-0.040	0.069	.037	.602
Gender→Attitude	0.056	-0.315	0.426	.018	.769
Education→SN	**0.451**	**0.106**	**0.796**	**.168**	**.010**
Income→SN	0.087	-0.219	0.393	.033	.578
Age→SN	-0.022	-0.078	0.034	-.063	.440
Gender→SN	0.111	-0.223	0.445	.041	.514
Education→PBC	0.233	-0.096	0.561	.103	.165
Income→PBC	-0.039	-0.299	0.221	-.018	.767
Age→PBC	-0.009	-0.063	0.045	-.030	.750
Gender→PBC	-0.047	-0.325	0.231	-.020	.741
Correlations					
Attitude↔SN	**0.835**	**0.629**	**1.042**	**.511**	**<.001**
Attitude↔PBC	**0.632**	**0.422**	**0.842**	**.458**	**<.001**
SN↔PBC	**0.598**	**0.403**	**0.793**	**.486**	**<.001**
Age↔Gender	-0.166	-0.366	0.033	-.107	.103
Education↔Age	**0.655**	**0.424**	**0.886**	**.413**	**<.001**
Income↔Age	-0.127	-0.325	0.071	-.078	.208
Education↔Gender	-0.006	-0.031	0.019	-.029	.644
Income↔Gender	-0.017	-0.043	0.009	-.079	.210
Education↔Income	-0.021	-0.046	0.003	-.100	.091
Indirect effects					
Education→Attitude→Intention→Behavior	0.017	-0.032	0.066	.004	.502
Education→SN→Intention→Behavior	**0.120**	**0.005**	**0.234**	**.025**	**.041**
Education→PBC→Intention→Behavior	0.004	-0.024	0.032	.001	.795
Education→Intention→Behavior	0.153	-0.055	0.361	.032	.149

Education→PBC→Behavior	0.054	-0.031	0.139	.011	.215
Education→Behavior (total indir)	**0.347**	**0.056**	**0.638**	**.073**	**.019**
Education→Behavior (total)	0.250	-0.571	1.071	.053	.550
Income→Attitude→Intention→Behavior	0.018	-0.026	0.061	.004	.425
Income→SN→Intention→Behavior	0.023	-0.060	0.106	.005	.584
Income→PBC→Intention→Behavior	-0.001	-0.007	0.006	.000	.843
Income→Intention→Behavior	-0.021	-0.208	0.166	-.005	.826
Income→PBC→Behavior	-0.009	-0.070	0.052	-.002	.770
Income→Behavior (total indir)	0.010	-0.230	0.250	.002	.935
Income→Behavior (total)	0.285	-0.377	0.947	.062	.399
Age→Attitude→Intention→Behavior	0.002	-0.005	0.008	.003	.617
Age→SN→Intention→Behavior	-0.006	-0.021	0.009	-.010	.452
Age→PBC→Intention→Behavior	0.000	-0.002	0.001	.000	.841
Age→Intention→Behavior	0.014	-0.012	0.039	.022	.299
Age→PBC→Behavior	-0.002	-0.014	0.010	-.003	.739
Age→Behavior (total indir)	0.007	-0.036	0.051	.012	.747
Age→Behavior (total)	0.055	-0.031	0.141	.089	.207
Gender→Attitude→Intention→Behavior	0.006	-0.036	0.048	.001	.779
Gender→SN→Intention→Behavior	0.030	-0.063	0.122	.006	.529
Gender→PBC→Intention→Behavior	-0.001	-0.008	0.007	.000	.846
Gender→Intention→Behavior	0.169	-0.027	0.365	.035	.091
Gender→PBC→Behavior	-0.011	-0.077	0.055	-.002	.745
Gender→Behavior (total indir)	0.193	-0.079	0.465	.040	.164
Gender→Behavior (total)	0.292	-0.451	1.035	.060	.441
Education→Attitude→Intention	0.035	-0.065	0.136	.009	.490
Education→SN→Intention	**0.253**	**0.034**	**0.472**	**.065**	**.024**
Education→PBC→Intention	0.008	-0.051	0.067	.002	.795
Education→Intention (total indir)	**0.296**	**0.023**	**0.569**	**.076**	**.034**
Education→Intention (total)	**0.620**	**0.112**	**1.127**	**.160**	**.017**
Income→Attitude→Intention	0.037	-0.053	0.128	.010	.416
Income→SN→Intention	0.049	-0.125	0.222	.013	.582
Income→PBC→Intention	-0.001	-0.014	0.012	.000	.843
Income→Intention (total indir)	0.085	-0.140	0.309	.023	.459
Income→Intention (total)	0.040	-0.413	0.494	.011	.861
Age→Attitude→Intention	0.003	-0.010	0.016	.007	.612
Age→SN→Intention	-0.012	-0.045	0.020	-.025	.449
Age→PBC→Intention	0.000	-0.003	0.003	-.001	.841
Age→Intention (total indir)	-0.009	-0.052	0.034	-.019	.667
Age→Intention (total)	0.020	-0.055	0.094	.038	.608
Gender→Attitude→Intention	0.013	-0.076	0.101	.003	.777
Gender→SN→Intention	0.062	-0.128	0.253	.016	.521
Gender→PBC→Intention	-0.002	-0.017	0.014	.000	.845
Gender→Intention (total indir)	0.074	-0.176	0.323	.019	.563
Gender→Intention (total)	0.432	-0.073	0.936	.109	.093
Attitude→Intention→Behavior	0.109	-0.004	0.222	.069	.059
SN→Intention→Behavior	**0.265**	**0.121**	**0.409**	**.150**	**<.001**

PBC→Intention→Behavior	0.016	-0.104	0.136	.008	.795
PBC→Behavior (total)	0.248	-0.062	0.558	.118	.117

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J12
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 12 (Parent-for-Child Sun Safety Behaviors Sample 2)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.829**	**0.526**	**1.132**	**.432**	**<.001**
PBC→Behavior	0.102	-0.492	0.696	.046	.737
Education→Behavior	0.226	-1.045	1.498	.039	.727
Income→Behavior	-0.279	-0.976	0.419	-.073	.433
Age→Behavior	-0.017	-0.071	0.036	-.053	.529
Gender→Behavior	-0.346	-1.223	0.531	-.082	.439
Attitude→Intention	0.114	-0.069	0.298	.133	.223
SN→Intention	**0.209**	**0.012**	**0.405**	**.173**	**.037**
PBC→Intention	**0.163**	**0.001**	**0.326**	**.140**	**.049**
Education→Intention	-0.129	-0.399	0.140	-.043	.347
Income→Intention	0.025	-0.182	0.231	.012	.815
Age→Intention	**-0.037**	**-0.072**	**-0.001**	**-.217**	**.043**
Gender→Intention	-0.148	-0.384	0.089	-.067	.221
Education→Attitude	0.072	-0.311	0.455	.021	.713
Income→Attitude	0.050	-0.298	0.397	.021	.778
Age→Attitude	-0.029	-0.060	0.003	-.146	.072
Gender→Attitude	0.206	-0.245	0.657	.081	.371
Education→SN	0.325	-0.175	0.826	.130	.203
Income→SN	0.188	-0.091	0.467	.113	.187
Age→SN	-0.005	-0.026	0.017	-.034	.660
Gender→SN	0.151	-0.140	0.442	.083	.310
Education→PBC	0.365	-0.123	0.852	.141	.142
Income→PBC	0.227	-0.068	0.522	.132	.131
Age→PBC	-0.017	-0.039	0.004	-.120	.105
Gender→PBC	**0.525**	**0.224**	**0.825**	**.278**	**.001**
Correlations					
Attitude↔SN	**0.187**	**0.032**	**0.341**	**.268**	**.018**
Attitude↔PBC	0.123	0.000	0.246	.177	.050
SN↔PBC	0.076	-0.007	0.158	.153	.072
Age↔Gender	-0.192	-0.471	0.086	-.096	.175
Education↔Age	**0.256**	**0.002**	**0.511**	**.175**	**.048**
Income↔Age	**0.620**	**0.258**	**0.983**	**.281**	**.001**
Education↔Gender	0.005	-0.013	0.022	.040	.614
Income↔Gender	**-0.027**	**-0.047**	**-0.007**	**-.158**	**.009**
Education↔Income	0.020	-0.002	0.041	.159	.074
Indirect effects					
Education→Attitude→Intention→Behavior	0.007	-0.031	0.045	.001	.724
Education→SN→Intention→Behavior	0.056	-0.057	0.170	.010	.331
Education→PBC→Intention→Behavior	0.049	-0.031	0.130	.009	.230
Education→Intention→Behavior	-0.107	-0.339	0.125	-.019	.365

Education→PBC→Behavior	0.037	-0.201	0.275	.006	.760
Education→Behavior (total indir)	0.042	-0.365	0.449	.007	.839
Education→Behavior (total)	0.269	-1.047	1.584	.046	.689
Income→Attitude→Intention→Behavior	0.005	-0.028	0.038	.001	.778
Income→SN→Intention→Behavior	0.032	-0.023	0.088	.008	.248
Income→PBC→Intention→Behavior	0.031	-0.017	0.079	.008	.211
Income→Intention→Behavior	0.020	-0.151	0.192	.005	.816
Income→PBC→Behavior	0.023	-0.117	0.163	.006	.746
Income→Behavior (total indir)	0.111	-0.137	0.360	.029	.379
Income→Behavior (total)	-0.167	-0.879	0.544	-.044	.645
Age→Attitude→Intention→Behavior	-0.003	-0.007	0.002	-.008	.249
Age→SN→Intention→Behavior	-0.001	-0.004	0.003	-.003	.656
Age→PBC→Intention→Behavior	-0.002	-0.006	0.001	-.007	.202
Age→Intention→Behavior	**-0.030**	**-0.060**	**-0.001**	**-.094**	**.039**
Age→PBC→Behavior	-0.002	-0.013	0.009	-.005	.749
Age→Behavior (total indir)	**-0.038**	**-0.068**	**-0.009**	**-.117**	**.011**
Age→Behavior (total)	-0.055	-0.112	0.001	-.170	.053
Gender→Attitude→Intention→Behavior	0.020	-0.032	0.071	.005	.459
Gender→SN→Intention→Behavior	0.026	-0.029	0.081	.006	.357
Gender→PBC→Intention→Behavior	0.071	-0.011	0.153	.017	.088
Gender→Intention→Behavior	-0.122	-0.321	0.076	-.029	.228
Gender→PBC→Behavior	0.053	-0.258	0.365	.013	.737
Gender→Behavior (total indir)	0.048	-0.326	0.421	.011	.803
Gender→Behavior (total)	-0.299	-1.238	0.641	-.071	.533
Education→Attitude→Intention	0.008	-0.037	0.054	.003	.722
Education→SN→Intention	0.068	-0.072	0.208	.023	.342
Education→PBC→Intention	0.059	-0.039	0.158	.020	.235
Education→Intention (total indir)	0.136	-0.051	0.322	.045	.154
Education→Intention (total)	0.006	-0.347	0.359	.002	.972
Income→Attitude→Intention	0.006	-0.034	0.046	.003	.779
Income→SN→Intention	0.039	-0.028	0.106	.020	.253
Income→PBC→Intention	0.037	-0.021	0.095	.018	.210
Income→Intention (total indir)	0.082	-0.034	0.198	.041	.165
Income→Intention (total)	0.107	-0.129	0.343	.053	.376
Age→Attitude→Intention	-0.003	-0.008	0.002	-.019	.202
Age→SN→Intention	-0.001	-0.005	0.003	-.006	.656
Age→PBC→Intention	-0.003	-0.007	0.001	-.017	.198
Age→Intention (total indir)	-0.007	-0.015	0.001	-.042	.093
Age→Intention (total)	**-0.044**	**-0.077**	**-0.010**	**-.259**	**.010**
Gender→Attitude→Intention	0.024	-0.037	0.084	.011	.448
Gender→SN→Intention	0.031	-0.035	0.098	.014	.357
Gender→PBC→Intention	0.086	-0.013	0.184	.039	.088
Gender→Intention (total indir)	0.141	-0.004	0.285	.064	.057
Gender→Intention (total)	-0.007	-0.281	0.267	-.003	.960
Attitude→Intention→Behavior	0.095	-0.073	0.262	.057	.267
SN→Intention→Behavior	**0.173**	**0.015**	**0.331**	**.075**	**.031**

PBC→Intention→Behavior	0.135	-0.003	0.273	.061	.055
PBC→Behavior (total)	0.237	-0.349	0.823	.106	.428

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Table J13
Parameter Estimates and 95% Confidence Intervals for the Path Analytic Model from Dataset 13 (Parent-for-Child Toothbrushing Sample)

Effect	B	CI_{95}		β	*p*
		LL	UL		
Direct effects					
Intention→Behavior	**0.265**	**0.076**	**0.454**	**.279**	**.006**
PBC→Behavior	**0.382**	**0.128**	**0.635**	**.294**	**.003**
Education→Behavior	-0.053	-0.489	0.383	-.010	.812
Income→Behavior	0.003	-0.327	0.333	.001	.986
Age→Behavior	**-0.044**	**-0.081**	**-0.007**	**-.160**	**.020**
Gender→Behavior	0.351	-0.043	0.746	.124	.081
Attitude→Intention	0.090	-0.017	0.196	.091	.098
SN→Intention	**0.258**	**0.071**	**0.446**	**.221**	**.007**
PBC→Intention	**0.315**	**0.128**	**0.502**	**.230**	**.001**
Education→Intention	-0.088	-0.560	0.383	-.017	.713
Income→Intention	-0.142	-0.509	0.224	-.038	.446
Age→Intention	0.002	-0.031	0.034	.006	.924
Gender→Intention	0.229	-0.130	0.587	.077	.212
Education→Attitude	0.101	-0.546	0.747	.019	.760
Income→Attitude	-0.060	-0.512	0.392	-.016	.795
Age→Attitude	-0.011	-0.044	0.022	-.038	.509
Gender→Attitude	0.018	-0.314	0.351	.006	.913
Education→SN	0.247	-0.371	0.865	.054	.433
Income→SN	0.309	-0.141	0.760	.098	.178
Age→SN	-0.003	-0.038	0.032	-.013	.861
Gender→SN	0.125	-0.173	0.423	.049	.410
Education→PBC	-0.138	-0.504	0.229	-.035	.462
Income→PBC	0.068	-0.349	0.486	.025	.748
Age→PBC	0.000	-0.026	0.025	-.002	.975
Gender→PBC	**0.348**	**0.072**	**0.624**	**.159**	**.013**
Correlations					
Attitude↔SN	**0.243**	**0.053**	**0.432**	**.155**	**.012**
Attitude↔PBC	**0.247**	**0.100**	**0.394**	**.186**	**.001**
SN↔PBC	**0.295**	**0.121**	**0.469**	**.263**	**.001**
Age↔Gender	-0.237	-0.502	0.028	-.112	.080
Education↔Age	-0.047	-0.204	0.110	-.039	.559
Income↔Age	0.189	-0.040	0.418	.110	.106
Education↔Gender	-0.002	-0.015	0.011	-.016	.782
Income↔Gender	**-0.020**	**-0.037**	**-0.002**	**-.119**	**.026**
Education↔Income	-0.004	-0.013	0.006	-.039	.463
Indirect effects					
Education→Attitude→Intention→Behavior	0.002	-0.013	0.018	.000	.764
Education→SN→Intention→Behavior	0.017	-0.028	0.061	.003	.456
Education→PBC→Intention→Behavior	-0.011	-0.043	0.020	-.002	.481
Education→Intention→Behavior	-0.023	-0.149	0.102	-.005	.715

Education→PBC→Behavior	-0.053	-0.196	0.091	-.010	.474
Education→Behavior (total indir)	-0.068	-0.289	0.153	-.013	.546
Education→Behavior (total)	-0.121	-0.613	0.371	-.024	.630
Income→Attitude→Intention→Behavior	-0.001	-0.013	0.010	.000	.800
Income→SN→Intention→Behavior	0.021	-0.016	0.059	.006	.269
Income→PBC→Intention→Behavior	0.006	-0.029	0.041	.002	.748
Income→Intention→Behavior	-0.038	-0.136	0.060	-.011	.449
Income→PBC→Behavior	0.026	-0.135	0.188	.007	.751
Income→Behavior (total indir)	0.014	-0.198	0.226	.004	.898
Income→Behavior (total)	0.017	-0.381	0.415	.005	.934
Age→Attitude→Intention→Behavior	0.000	-0.001	0.001	-.001	.547
Age→SN→Intention→Behavior	0.000	-0.003	0.002	-.001	.863
Age→PBC→Intention→Behavior	0.000	-0.002	0.002	.000	.975
Age→Intention→Behavior	0.000	-0.008	0.009	.002	.923
Age→PBC→Behavior	0.000	-0.010	0.010	-.001	.975
Age→Behavior (total indir)	0.000	-0.016	0.015	-.001	.976
Age→Behavior (total)	**-0.044**	**-0.084**	**-0.004**	**-.161**	**.030**
Gender→Attitude→Intention→Behavior	0.000	-0.008	0.008	.000	.915
Gender→SN→Intention→Behavior	0.009	-0.016	0.034	.003	.500
Gender→PBC→Intention→Behavior	0.029	-0.005	0.063	.010	.092
Gender→Intention→Behavior	0.061	-0.051	0.172	.021	.286
Gender→PBC→Behavior	0.133	-0.012	0.277	.047	.072
Gender→Behavior (total indir)	**0.232**	**0.029**	**0.434**	**.082**	**.025**
Gender→Behavior (total)	**0.583**	**0.134**	**1.031**	**.205**	**.011**
Education→Attitude→Intention	0.009	-0.049	0.068	.002	.762
Education→SN→Intention	0.064	-0.098	0.226	.012	.439
Education→PBC→Intention	-0.043	-0.162	0.076	-.008	.475
Education→Intention (total indir)	0.030	-0.159	0.218	.006	.758
Education→Intention (total)	-0.059	-0.549	0.432	-.011	.814
Income→Attitude→Intention	-0.005	-0.047	0.036	-.001	.799
Income→SN→Intention	0.080	-0.046	0.206	.022	.215
Income→PBC→Intention	0.022	-0.109	0.152	.006	.746
Income→Intention (total indir)	0.096	-0.129	0.322	.026	.403
Income→Intention (total)	-0.046	-0.410	0.318	-.012	.803
Age→Attitude→Intention	-0.001	-0.004	0.002	-.003	.536
Age→SN→Intention	-0.001	-0.010	0.008	-.003	.862
Age→PBC→Intention	0.000	-0.008	0.008	.000	.975
Age→Intention (total indir)	-0.002	-0.017	0.013	-.007	.803
Age→Intention (total)	0.000	-0.036	0.035	-.001	.985
Gender→Attitude→Intention	0.002	-0.028	0.032	.001	.914
Gender→SN→Intention	0.032	-0.054	0.119	.011	.464
Gender→PBC→Intention	**0.110**	**0.001**	**0.218**	**.037**	**.048**
Gender→Intention (total indir)	0.144	-0.004	0.291	.048	.057
Gender→Intention (total)	0.372	-0.014	0.758	.125	.059
Attitude→Intention→Behavior	0.024	-0.011	0.059	.025	.183
SN→Intention→Behavior	0.069	-0.005	0.142	.062	.066

PBC→Intention→Behavior	**0.083**	**0.015**	**0.152**	**.064**	**.016**
PBC→Behavior (total)	**0.465**	**0.227**	**0.703**	**.358**	**<.001**

Note. Parameter estimates in boldface are statistically significant ($p < .05$). B = Unstandardized path coefficient; CI95 = 95% confidence interval of B; LL = Lower limit of 95% confidence interval; UL = Lower limit of 95% confidence interval; β = Standardized path coefficient; SN = Subjective norms; PBC = Perceived behavioral control; total = Total effect; total indir = Total indirect effect.

Appendix K

Standardized Path Coefficients, 95% Confidence Intervals, and Probability Estimates from Meta-Analytic Structural Equation Model Across All Datasets

Effect	β	CI_{95}		*p*
		LL	UL	
Direct effects				
Intention→Behavior	.493	.386	.600	<.001
PBC→Behavior	.045	-.087	.176	.504
Education→Behavior	.040	-.007	.088	.098
Income→Behavior	-.007	-.042	.028	.701
Age→Behavior	.001	-.076	.079	.972
Gender→Behavior	.007	-.045	.059	.795
Attitude→Intention	.321	.203	.440	<.001
SN→Intention	.181	.081	.282	<.001
PBC→Intention	.296	.166	.425	<.001
Education→Intention	.004	-.025	.032	.804
Income→Intention	-.004	-.033	.024	.764
Age→Intention	.001	-.059	.062	.964
Gender→Intention	.034	-.016	.085	.183
Education→Attitude	.032	.000	.064	.049
Income→Attitude	.033	.000	.065	.050
Age→Attitude	.004	-.043	.051	.868
Gender→Attitude	.078	.035	.121	<.001
Education→SN	.031	-.008	.070	.117
Income→SN	.044	.013	.076	.005
Age→SN	.007	-.038	.052	.747
Gender→SN	.057	.002	.113	.043
Education→PBC	.001	-.041	.043	.963
Income→PBC	.027	-.011	.066	.160
Age→PBC	-.017	-.071	.037	.540
Gender→PBC	.088	.029	.148	.004
Correlations				
Attitude↔SN	.413	.323	.503	<.001
Attitude↔PBC	.388	.315	.461	<.001
SN↔PBC	.383	.277	.490	<.001
Age↔Gender	-.116	-.162	-.069	<.001
Education↔Age	.203	.087	.318	.001
Income↔Age	.072	-.022	.166	.132
Education↔Gender	-.047	-.079	-.016	.003
Income↔Gender	-.082	-.131	-.033	.001
Education↔Income	.091	.010	.172	.028
Indirect effects				
Attitude→Intention→Behavior	.158	.094	.223	<.001
SN→Intention→Behavior	.089	.039	.140	.001
PBC→Intention→Behavior	.146	.067	.224	<.001
Education→Attitude→Intention→Behavior	.005	.000	.011	.068

Education→SN→Intention→Behavior	.003	-.001	.007	.152
Education→PBC→Intention→Behavior	.000	-.006	.006	.963
Education→Intention→Behavior	.002	-.012	.016	.804
Education→PBC→Behavior	.000	-.002	.002	.963
Income→Attitude→Intention→Behavior	.005	.000	.011	.069
Income→SN→Intention→Behavior	.004	.000	.008	.029
Income→PBC→Intention→Behavior	.004	-.002	.010	.189
Income→Intention→Behavior	-.002	-.016	.012	.764
Income→PBC→Behavior	.001	-.003	.005	.546
Age→Attitude→Intention→Behavior	.001	-.007	.008	.868
Age→SN→Intention→Behavior	.001	-.003	.005	.748
Age→PBC→Intention→Behavior	-.002	-.011	.006	.545
Age→Intention→Behavior	.001	-.029	.030	.964
Age→PBC→Behavior	-.001	-.004	.003	.652
Gender→Attitude→Intention→Behavior	.012	.004	.021	.004
Gender→SN→Intention→Behavior	.005	-.001	.011	.078
Gender→PBC→Intention→Behavior	.013	.002	.024	.023
Gender→Intention→Behavior	.017	-.008	.042	.187
Gender→PBC→Behavior	.004	-.008	.016	.515
Education→Attitude→Intention	.010	-.001	.021	.065
Education→SN→Intention	.006	-.002	.013	.150
Education→PBC→Intention	.000	-.012	.013	.963
Income→Attitude→Intention	.010	-.001	.022	.065
Income→SN→Intention	.008	.001	.015	.028
Income→PBC→Intention	.008	-.004	.020	.180
Age→Attitude→Intention	.001	-.014	.016	.868
Age→SN→Intention	.001	-.007	.010	.748
Age→PBC→Intention	-.005	-.021	.011	.543
Gender→Attitude→Intention	.025	.009	.042	.003
Gender→SN→Intention	.010	-.001	.022	.076
Gender→PBC→Intention	.026	.005	.047	.015
Sums of indirect effects				
Education→Behavior	.010	-.007	.027	.259
Income→Behavior	.012	-.005	.030	.175
Age→Behavior	-.001	-.032	.030	.936
Gender→Behavior	.051	.025	.078	<.001
Education→Intention	.016	-.006	.039	.155
Income→Intention	.027	.005	.048	.014
Age→Intention	-.002	-.030	.025	.863
Gender→Intention	.062	.032	.091	<.001
Total effects				
PBC→Behavior	.191	.086	.295	<.001
Education→Behavior	.050	.001	.099	.044
Income→Behavior	.005	-.031	.042	.777
Age→Behavior	.000	-.074	.074	.998
Gender→Behavior	.058	.008	.108	.022

Education→Intention	.020	-.013	.053	.237
Income→Intention	.022	-.012	.056	.200
Age→Intention	-.001	-.062	.060	.974
Gender→Intention	.096	.046	.146	<.001

Note. β = Standardized path coefficient; CI_{95} = 95% confidence interval of path coefficient; SN = Subjective norms; PBC = Perceived behavioral control.