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Prototypes Reflect Normative Perceptions: Implications for the Development of Reasoned Action Theory

Michael Hennessy[1], **Amy Bleakley**[1], and **Morgan Ellithorpe**[2]

[1]Annenberg School for Communication, University of Pennsylvania, 3620 Walnut Street, Philadelphia, PA 19104

[2]Department of Advertising and Public Relations, Michigan State University, 404 Wilson Rd., East Lansing, MI 48824

Abstract

The reasoned action approach is one of the most successful behavioral theories in the history of social psychology. This study outlines the theoretical principles of reasoned action and considers when it is appropriate to augment it with a new variable. To demonstrate, we use survey data collected from a 4–17 year old U.S. adolescents to test how the "prototype" variables fit into reasoned action approach. Through confirmatory factor analysis, we find that the prototype measures are normative pressure measures and when treated as a separate theoretical construct, prototype identity is not completely mediated by the proximal predictors of behavioral intention. We discuss the assumptions of the two theories and finally consider the distinction between augmenting a specific theory versus combining measures derived from different theoretical perspectives.

Keywords

reasoned action; prototypes; alcohol and aggression; adolescents

The reasoned action approach (Ajzen & Albarracín, 2007; Fishbein, 2008; Fishbein & Ajzen, 2010) is an explanation for behavior used in psychology, advertising/marketing, public health, communication, and business. Its focus is *intention to perform a target behavior* as a dependent variable and a predictor of behavior because it is concerned with the factors influencing intention formation and the relationship between intention and prospective behavioral performance (Kim & Hunter, 1993). Behavior is primarily determined by intention, but because environmental factors and/or skills and ability limitations may make performance difficult, a measure of perceived control is used as a proxy for these factors influencing control over performance. Therefore, behavior is a function of intention and control (Webb & Sheeran, 2006).

Contact: *mhennessy163@gmail.com*, phone: 401-487-4664; *ableakley@asc.upenn.edu*, phone: 415-573-1961; *mellitho@msu.edu*, phone: 517-355-0256.

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Intention is determined by attitudes (i.e., favorableness or unfavorableness towards performing the behavior), normative pressure (i.e., perceptions about what others think and do with regards to the behavior), and perceived control (i.e., ability to perform the behavior). Each of these three proximal predictors of intention (the "direct measures" in Figure 1) is determined by corresponding sets of beliefs. Attitudes are determined by beliefs that performing the behavior will lead to specific consequences, sometimes grouped into "affective" and "instrumental" outcomes (see the meta-analysis of McEachan et al., 2016). Normative pressure is determined by two types of beliefs. Injunctive normative beliefs[1] (whether specific referents think the individual should or should not perform the target behavior (Manning, 2009)) and descriptive normative beliefs (whether similar significant others are or are not performing the behavior (Rivis & Sheeran, 2003)). Control is determined by beliefs reflecting the capacity and autonomy to perform the behavior (Armitage & Conner, 2001; Yzer, 2012, 2013). Ajzen explains how reasoned action operates cognitively (emphasis in the original):

> The idea that beliefs form the foundation for our attitudes is embedded in the most popular model of attitude formation and structure, the expectancy value (EV) model. According to the EV model, we form behavioral beliefs by associating performance of the behavior with certain outcomes… Because the outcomes that come to be linked to the behavior are already valued positively or negatively, we automatically and simultaneously acquire an attitude toward the behavior. In this fashion, we learn to form positive attitudes toward behaviors we believe produce mainly desirable outcomes, and we form unfavorable attitudes toward behaviors we associate with mostly undesirable outcomes. Although people can form many different behavioral beliefs, it is assumed that only a relatively small number influence their attitudes in the moment. It is these readily *accessible* beliefs that are considered to be the prevailing determinants of a person's attitude. (Ajzen, 2015, p. 127)

Finally, variables as personality traits (e.g., sensation seeking), demographics, intervention status, or past behavior (e.g., those grouped under the "External Variables" column in Figure 1) are expected to influence behavior only indirectly in the reasoned action model (e.g., Ajzen, 2015, Figure 4, p. 135). This assumption of complete mediation is known as "theoretical sufficiency" (Yzer, 2013) but whether a given background variable has an effect on those proximal variables is an empirical question (in Figure 1 these paths are dashed).

Researchers have tried to improve reasoned action's explanatory power by adding new variables to it, characterized by James Jaccard as "the search for the elusive fourth predictor" (remarks at the Martin Fishbein Memorial Lecture Series, the Annenberg Public Policy Center, University of Pennsylvania, on February10, 2011) and by Langdridge et al. as the "additional variables paradigm"(Langdridge, Sheeran, & Connolly, 2007, p. 1885). They review the role of additional variables such as desire, affective vs. cognitive attitude measures, anticipated regret, self-identity, and moral norms as they pertain to the behavior of having a child. Other examples include adding habit in predicting drinking and driving and

[1] In early studies they were labeled "subjective" normative beliefs (Madden, Ellen, & Ajzen, 1992).

speeding (Lheureux, Auzoult, Charlois, Hardy-Massard, & Minary, 2015), personal responsibility as a variable predicting hygiene practices (Jenner, Watson, Miller, Jones, & Scott, 2002), and social activism and organizational relevance as variables predicting participation in vaccine trials (Frew et al., 2010).[2]

One other construct used with reasoned action is the Prototype model (Rivis, Sheeran, & Armitage, 2006; Todd, Kothe, Mullan, & Monds, 2016). The prototype approach was developed to explain adolescent risk behaviors such as unsafe sex, smoking, and drinking (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008) but is also applied to other behaviors.[3] Because of how prototypes are used in a reasoned action framework, it is useful to examine whether prototype measures discriminate from these constructs and how prototypes perform as an additional predictor of intention.

Prototypes and Dual Processing

Prototypes are a component of a dual-processing model used to understand how individuals process persuasion attempts from heterogeneous sources such as political campaigns and commercial advertising (Cobb & Kuklinski, 1997; Dillard & Peck, 2000; Meyers-Levy & Malaviya, 1999). Dual processing assumes that decision-making is a combination of cognitive styles (Evans, 2011; Wood, 2000; Wood, Kallgren, & Preisler, 1985): "systematic" processing focuses on the logic and internal consistency of the persuasion attempt requiring focused cognition while "peripheral" (or "heuristic") processing supplants systematic analysis with rules that ignore the structure of the argument in formulating responses (e.g., "Experts are usually credible", or "People like me approve of this message, so I should also"). Examples of dual process models include the Elaboration Likelihood Model (Cacioppo, Petty, & Stoltenberg, 1985) and the Heuristic Systematic Model (Chaiken, 1980) and descriptions of others can be found elsewhere (Evans, 2008).

"Prototype perceptions" refer to the evaluation of persons who perform the behavior (the "Favorability" prototype) and the similarity between the individual and the performer of the behavior (the "Similarity" prototype). Prototype perceptions predicts willingness to perform a behavior, which then predicts behavior. As Pepper summarizes,

> According to the prototype/willingness model, risky behavior, particularly among adolescents, is driven by a combination of reasoned cognitions and social reactions.

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[2]Not all theory change increases complexity and the devolution of the "Easy-Difficult" semantic differential item is an illustrative counter example. "Easy-Difficult" was originally used as both a measure of attitude, like Good-Bad or Foolish-Wise, two semantic-differential items with a long history (Fishbein & Raven, 1962) and also as a statistical control (Madden et al., 1992). However, the issue of its construct validity was never investigated to answer the question: What kind of measure is "Easy-Difficult"? Consider that if Easy behaviors are "good" and Difficult ones are "bad", then "Easy-Difficult" is an attitude measure, but if individuals perceive many people performing the target behavior or few people performing the target behavior, then "Easy-Difficult" is a function of descriptive norms. Finally, if behaviors are classified as either Easy or Difficult because of the absence or presence of barriers to their performance, then "Easy-Difficult" is control measure. Once some comparative analysis was done on the quantitative performance of "Easy-Difficult" (Leach, Hennessy, & Fishbein, 2001; Yzer, 2012; Yzer, Hennessy, & Fishbein, 2004), the general conclusion was that it probably should not be used in a reasoned action analysis because of these conceptual ambiguities.

[3]The other component of the prototype approach is "willingness" to perform the behavior. Prototype theorists believe that willingness captures a more "non-rational" dimension of decision-making than intention measures used in reason action (Gibbons, Gerrard, Blanton, & Russell, 1998) while Fishbein and Ajzen contend that willingness is a type of intention measure (Fishbein & Ajzen, 2010, pp. 42–43, 463). Because we are concerned the role of prototypes in reason action theory (and not the reverse), we don't discuss the willingness/intention issue here.

> One assumption of the model is that adolescents associate risk behaviors with specific social images (also called prototypes) of a person who engages in that behavior. Comparing themselves to that social image influences their willingness and behavior (Pepper et al., p. 149).

Advocates of the prototype approach suggest that the emphasis on dual processing and the evaluation of performers improves upon reasoned action (Gerrard et al., 2008).

Research Questions

We investigate how prototype measures relate to attitude and normative pressure constructs and how prototypes fit into the reasoned action model. Because "favorability" is an essential component of attitudes (Ajzen, 2001), a positive evaluation of someone performing the target behavior should correlate with a favorable assessment of the target behavior. Similarly, identification with the performer of the target behavior should be a normative pressure measure because the only reference to persons who perform the target behavior occur in a normative context (i.e., other reasoned action measures assess the target behavior itself). Our research questions are:

> RQ1: What kind of reasoned action measures are prototype favorability and similarity?
>
> RQ2: Is the effect of the prototype construct on intention mediated by the three reasoned action direct proximal predictors?

Methods and Measures

The data here are from a US study of adolescents designed to identify the influence of media exposure to co-occurring risk behaviors (e.g., alcohol use and sex, alcohol and fighting). Respondents (N = 2,432) aged 14–17 were recruited from opt-in panels by the survey company GfK (http://www.gfk.com/en-us/) between November 13 and December 14, 2015. Adolescents were recruited directly (n = 588) because they had already registered with these online providers and also through parents who were registered with the opt-in providers (n = 1,843). Parents with eligible teens were sent an email invitation for their teen to participate and a link connected the parent to a screen with information about the study and then to "Continue" for obtaining parental consent. Quotas for African-American (n=1000) and White (n=990) participants were set based on the study hypotheses and analysis plan. Fifty-one percent of the respondents were male with an age range from 14 (21%) to 17 (27%). Fifty percent were self-identified as White, the rest were African American (the respondents self-identified as Latino/Hispanic were excluded here as were all other ethnicities).

Our behavioral focus is the co-occurrence of alcohol use and fighting. [4] Note that although reasoned action has been used to understand alcohol use (Cooke, Sniehotta, & Schüz, 2007; Johnston & White, 2003; Marcoux & Shope, 1997) and aggression (Doane, Pearson, &

[4]Adolescent behavioral research usually focuses on a specific behavior (e.g., alcohol consumption) but risk behaviors frequently co-occur with one another (Brener & Collins, 1998; DuRant, Smith, Kreiter, & Krowchuk, 1999; Hair, Park, Ling, & Moore, 2009; Jessor, 1991). Alcohol use and aggressive behaviors are common in adolescence. The use of the reasoned action approach in this study to examine the combination of alcohol and aggression sex is consistent with the idea of expectancies explaining one's behavioral

Kelley, 2014; Roberto, Meyer, Boster, & Roberto, 2003; Tolman, Edleson, & Fendrich, 1996; Welsh & Gordon, 1991) as independent outcomes, we apply it to their combination as a single behavior (Bleakley et al., 2017). Note that this is the kind of "risky" population and behavior that is also used in many prototype studies, so it is especially appropriate for a comparative analysis.

Measures

Alcohol and fighting co-occurrence was explained as follows:

> The next combination of behaviors we will ask about is **drinking alcohol and physical fighting**, for example having at least one or more drinks either before or after you get into a physical fight. When we say a "fighting", we mean getting into a physical fight with another person, which may include hitting, pushing, shoving, or being injured with an object or weapon. When we say "drinking alcohol", we mean having at least one drink of alcohol. In this survey, a "drink of alcohol" is one 12 oz. can or bottle of beer, or one 4 oz. glass of wine, or one mixed drink, or one shot of liquor.

Fifty-six percent reported no drinking or fighting in the last 6 months, 32% reported drinking or fighting in the last 6 months, and 12% reported both drinking and fighting. Seven percent reported at least one co-occurrence.

For *intention*, the item was "How likely is it that you will combine fighting and drinking alcohol in the next 6 months?" The semantic differential *attitude* items were "Bad-Good", "Foolish-Wise", "Not Enjoyable-Enjoyable", "Boring-Exciting", and "Harmful-Beneficial". The *injunctive norm* item was: "Do most people who are important to you think that you should not/should fight and drink alcohol in the next 6 months?". The *descriptive norm* item was "Will people like you fight and drink alcohol in the next 6 months?" . The *control* measure combined a measure of self-efficacy ("If I really wanted to, I am certain that I could combine fighting and drinking alcohol in the next 6 months") and a measure of autonomy ("It is completely up to me whether I combine fighting and drinking alcohol in the next 6 months"). All items were coded from 1–7.

Prototype favorability was "How favorable is your impression of the type of person your age who engages in the combination of fighting and drinking alcohol?" coded from 1–7, from not favorable to favorable. Prototype similarity was "How similar are you to the type of person your age who engages in the combination of fighting and drinking alcohol?" coded from 1, not similar to 7, very similar.

Statistical Analysis

To determine whether a variable augments reasoned action, analysts need to know whether the variable is an indicator of a reasoned action construct (RQ1) or whether it is more appropriate as a precursor variable (RQ2). RQ1 requires a demonstration that the variable discriminants from the attitudinal, normative pressure, and control measures. Measurement

decision as a function of the constructs relevant to intention formation and corresponding underlying beliefs about what may or may not happen when these two behaviors are combined in a particular situation.

modeling is a better way to implement this than comparing the correlations between construct indicators for statistical reasons elaborated elsewhere (Bollen & Paxton, 1998; Brown, 2006). To investigate RQ1, we estimate a measurement model with the two reasoned action constructs and a prototype latent variable to estimate their correlation (Anderson & Gerbing, 1988). RQ2 treats the variable as a mediated precursor variable. Although these analysis principles are documented (Bleakley & Hennessy, 2012; Hennessy et al., 2010), many attempts to augment reasoned action use *ad hoc* "hierarchical" regressions (Lheureux et al., 2015; Paquin & Keating, 2017; Plows et al., 2017; Rivis et al., 2006; van der Linden, 2011; Wilson, Woolfson, Durkin, & Elliott, 2016) that do not include a mediation analysis (Bryan, Schmiege, & Broaddus, 2007; Holbert & Stephenson, 2003) (note that Paquin and Keating's meta-analysis below is an exception to this generalization). These analyses fail to persuade that they identify important extensions to reasoned action because the alternative explanations of (1) miss-labeled measures and (2) theoretical sufficiency have not been rejected.

Results

Table 1 shows all correlations. The semantic differential items are highly correlated and the polychoric alpha (Gadermann, Guhn, & Zumbo, 2012) for the attitude scale is .93. The two normative pressure items correlated at .71 and the prototype items at .78. However, the prototype measures have their highest correlation with the normative measures even though favorability should correlate the highest with the attitude measures and that similarity should correlate the highest with descriptive norms. All variables show high correlations with intention.

Table 2 shows the results of the confirmatory factor analysis. Because latent variables with two indicators are under identified, we constrain the regression coefficients to equality (Little, Cunningham, Shahar, & Widaman, 2002) and all models correlate the same error terms of the attitude construct to improve the fit (Gerbing & Anderson, 1984). Each row is a separate model. Model 1 is the reasoned action two factor model with the semantic differential items reflecting an attitude construct and the norm items a normative pressure construct. Models 2–4 are those with the single prototype measures as either an attitude or normative pressure measure. Of these, the best-fitting model is #3. The hypothesized model (#6) fits poorly because of low loading of prototype favorability on the attitude latent variable: #4 is the worst when a single prototype measure is reflective of attitudes, and #7 the worst when both prototype measures are attitudes. In summary, it appears that both similarity and favorability are normative pressure measures: the "identity" aspect of prototype measures is stronger than the distinction between identity and evaluation (i.e., the "attitude" aspect).

Figure 2 shows the latent factors and their correlations when favorability and similarity are indicators of a single prototype latent construct and the reasoned action constructs are defined as in Table 2: the correlation between normative pressure and prototype is .80, which suggests a lack of discrimination between these two traits. Figure 3 shows the results prototype as a precursor. Model A is the mediated model. Prototype positively influences attitude and normative pressure, but the effect is larger for normative pressure. This is not

surprising given the high correlation between normative pressure and prototype. Fifty percent of the variance in intention is explained (Bentler & Raykov, 2000). Model B adds the direct effect of prototype on intention. Both the direct and indirect effects of prototype are significant, although the R^2 is trivially lower compared with Model A. In both mediational models the effect of attitude on intention is essentially identical. We conclude that prototype partitions the normative pressure effect into two components; the sum of the direct effect of prototype and the direct effect of NP in Model B is identical to the direct effect of NP in Model A.

Discussion

Ajzen's quote above does not stipulate how individual cognition produces the attitudinal, normative, or control constructs. Despite this, critiques of reasoned action insist that "reasoned" action assumes "rational belief processing" on the part of individuals (Gibbons et al., 1998; Reyna & Farley, 2006), but because reasoned action simply asserts that beliefs will influence the mediating constructs, it does not preclude the application of heuristic processing (or any other variety) of belief-relevant cues in forming the attitude, normative pressure, or behavioral control constructs (Blank & Hennessy, 2012; Yzer, 2013). Therefore, the prototype approach is not theoretically inconsistent with reasoned action and may offer a more nuanced look at the normative pressure component.

It is true that reasoned action is focused on the evaluation of specific behaviors and expectancy value is an important part of its logic (Behling & Starke, 1973; Fromme, Katz, & Rivet, 1997) while the prototype approach is focused on the identification of the respondent with performers of the behavior (Cohen, 1991; Tal-Or & Cohen, 2010) . In this respect, reasoned action and prototypes come from different theoretical worlds. Paquin and Keating's meta-analysis (Paquin & Keating, 2017) makes this point more effectively than any single example. They used 73 studies (total respondents N = 23,917 with 855 effect sizes) to model different ways to incorporate identity measures into reasoned action including non-mediated and mediated precursor variable models as well as measurement models assuming prototype measures reflect intention (as actually suggested by Fishbein, 1997, p. 85). Paquin and Keating also consider as a moderator the match between the identity measure and behavior: statements like "I think of myself as a smoker" would be considered matched when associated with a smoking behavior, but "Being a parent is an important part of who I am" would not be considered a match with some parenting behavior (p. 7). *Their matching logic attempts to overcome the contradiction between the behavioral focus of reasoned action and the identity focus of prototypes.* Their results are both interesting and subtle and cannot be fully described here. Briefly, they find the mediated model a poor fit and suggest that the superior alternatives were the unmediated model and the "identity as intention" measurement model that assumes that identity measures are measures of a latent intention factor. Because they used meta-analysis, they could not evaluate RQ1 but their results supporting the unmediated model are consistent with ours.

Finally, augmenting a theory with components from another is not the same as to combining two theories in a single analysis. Reasoned action theorists might consider identification with the performer as a moderator (for an example, see Rivis, Abraham, & Snook, 2011)

especially when developing behavioral interventions (Fishbein & Yzer, 2003). Identifying behaviors susceptible to dual processing is an important research priority for prototype theorists: prototypes might be appropriate when applied to decisions made "heuristically" by adolescents (or adults) but one wonders about its relevance to behaviors like paying taxes (Bobek & Hatfield, 2003), getting a vaccination (Dillard, 2011), donating organs (Hyde & White, 2010), or limiting children's TV viewing (Bleakley, Piotrowski, Hennessy, & Jordan, 2013), all of which may not be the type of behavior amenable to superficial cognition.

Limitations and Future Research

Our analysis uses adolescent data and a specific combination of behaviors. It is possible that the results are limited by one or both of these characteristics. In addition, the prototype approach might work better with adults because their identities (and their evaluations of them) are better established (Marcia, 1980; Moshman, 2011). Finally, more general issues about augmenting theories cannot be addressed here. Some include "What other rules should be used to identify theories that can and can't be meaningfully combined?", "What kinds of combined theories reflect a useful extension rather than a merely an ad hoc mixture of theoretical traditions?" and "When do combined theories represent confirming or disconfirming evidence for relevant hypotheses?" Questions like these need to be answered by theory-motivated meta-analytic statistical methods.

Conclusion

As reasoned action evolves and attention is paid to new candidates for the elusive fourth predictor, it is important to define the conditions for successful augmentation. In the case of the prototype model, favorability and similarity constructs do not pass the two criteria described here as required for inclusion: prototype variables were indistinguishable from normative pressure. However, what is clear is that the two approaches could be combined in informative analyses that will enlarge the theoretical boundary conditions that currently limit predicting and changing behavior.

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References

Ajzen I. Nature and operation of attitudes. Annual review of psychology. 2001; 52(1):27–58.

Ajzen I. Consumer attitudes and behavior: the theory of planned behavior applied to food consumption decisions. Rivista di Economia Agraria. 2015; 70(2):121–138.

Ajzen, I., Albarracín, D. Predicting and changing behavior: a reasoned action approach. In: Ajzen, I.Albarracín, D., Hornik, R., editors. Prediction and Change of Health Behavior. Mahwah, New Jersey: Lawrence Erlbaum; 2007. p. 1-22.

Anderson J, Gerbing D. Structural equation modeling in practice: a review and recommended two-step approach. Psychological Bulletin. 1988; 127:142–161.

Armitage C, Conner M. Efficacy of the theory of planned behavior: a meta-analytic review. British Journal of Social Psychology. 2001; 40:471–499. [PubMed: 11795063]

Behling O, Starke FA. The Postulates of Expectancy Theory. The Academy of Management Journal. 1973; 16(3):373–388. DOI: 10.2307/254999

Bentler P, Raykov T. On measures of explained variance in nonrecursive structural equation models. Journal of Applied Psychology. 2000; 85(1):125–131. [PubMed: 10740963]

Blank MB, Hennessy M. A Reasoned Action Approach to HIV Prevention for Persons with Serious Mental Illness. Annals of the American Academy of Political and Social Science. 2012; 640:173–188. DOI: 10.1177/0002716211424711

Bleakley A, Ellithorpe ME, Hennessy M, Khurana A, Jamieson P, Weitz I. Alcohol, Sex, and Screens: Modeling Media Influence on Adolescent Alcohol and Sex Co-Occurrence. The Journal of Sex Research. 2017; doi: 10.1080/00224499.2017.1279585

Bleakley A, Hennessy M. The quantitative analysis of reasoned action theory. The Annals of the American Academy of Political and Social Science. 2012; 640(1):28–41. DOI: 10.1177/0002716211424265

Bleakley A, Piotrowski JT, Hennessy M, Jordan A. Predictors of parents' intention to limit children's television viewing. Journal of Public Health. 2013; 35(4):525–532. DOI: 10.1093/pubmed/fds104 [PubMed: 23335598]

Bobek DD, Hatfield R. An investigation of the theory of planned behavior and the role of moral obligation in tax compliance. Behavioral Research in Accounting. 2003; 15(1):13–38.

Bollen K, Paxton P. Detection and determinants of bias in subjective measures. American Sociological Review. 1998; 63(3):465–478.

Brener ND, Collins JL. Co-occurrence of health-risk behaviors among adolescents in the United States. Journal of Adolescent Health. 1998; 22(3):209–213. [PubMed: 9502008]

Brown, T. Confirmatory Factor Analysis for Applied Research. New York: Guilford; 2006.

Bryan A, Schmiege S, Broaddus M. Mediational Analysis in HIV/AIDS Research: Estimating Multivariate Path Analytic Models in a Structural Equation Modeling Framework. AIDS and Behavior. 2007; 11(3):365–383. DOI: 10.1007/s10461-006-9150-2 [PubMed: 16917669]

Cacioppo, JT., Petty, RE., Stoltenberg, CD. Processes of social influence: The Elaboration Likelihood model of persuasion. In: Kendall, PC., editor. Advances in cognitive-behavioral research and therapy. Vol. 4. San Diego, CA, US: Academic Press; 1985. p. 215-274.

Chaiken S. Heuristic versus systematic information processing and the use of source versus message cues in persuasion. Journal of Personality and Social Psychology. 1980; 39(5):752–766.

Cobb MD, Kuklinski JH. Changing Minds: Political Arguments and Political Persuasion. American Journal of Political Science. 1997; 41(1):88–121.

Cohen J. The "Relevance" of cultural identity in audiences' interpretations of mass media. Critical Studies in Mass Communication. 1991; 8(1991):442–454.

Cooke R, Sniehotta F, Schüz B. Predicting binge-drinking behaviour using an extended TPB: examining the impact of anticipated regret and descriptive norms. Alcohol and Alcoholism. 2007; (42):84–91. [PubMed: 17185302]

Dillard JP. An Application of the Integrative Model to Women's Intention to Be Vaccinated Against HPV: Implications for Message Design. Health Communication. 2011; 26(5):479–486. DOI: 10.1080/10410236.2011.554170 [PubMed: 21452094]

Dillard JP, Peck E. Affect and persuasion: Emotional responses to public service announcements. Communication Research. 2000; 27(4):461–495.

Doane A, Pearson M, Kelley M. Predictors of cyberbullying perpetration among college students: An application of the Theory of Reasoned Action. Computers in Human Behavior. 2014; 36:154–162.

DuRant RH, Smith JA, Kreiter SR, Krowchuk DP. The relationship between early age of onset of initial substance use and engaging in multiple health risk behaviors among young adolescents. Archives of Pediatrics & Adolescent Medicine. 1999; 153(3):286. [PubMed: 10086407]

Evans J. Dual-processing accounts of reasoning, judgment, and social cognition. Annual Review of Psychology. 2008; 59:255–278. DOI: 10.1146/annurev.psych.59.103006.093629

Evans J. Dual-process theories of reasoning: Contemporary issues and developmental applications. Developmental Review. 2011; 31(2–3):86–102.

Fishbein, M. Predicting, understanding, and changing socially relevant behaviors: Lessons learned. In: McGarty, C., Haslam, SA., editors. The Message of Social Psychology. Oxford, UK: Blackwell; 1997. p. 77-91.

Fishbein M. A reasoned action approach to health promotion. Medical Decision Making. 2008; 28:834–844. [PubMed: 19015289]

Fishbein, M., Ajzen, I. Predicting and Changing Behavior: A Reasoned Action Approach. New York: Taylor and Francis; 2010.

Fishbein M, Raven B. The AB scale: an operational definition of belief and attitude. Human Relations. 1962; 15:35–44.

Fishbein M, Yzer M. Using theory to design effective health behavior interventions. Communication Theory. 2003; 13(2):164–183.

Frew P, Archibald M, Diallo D, Hou SI, Horton T, Chan K, … del Rio C. An extended model of reasoned action to understand the influence of individual- and network-level factors on African Americans' participation in HIV vaccine research. Prevention Science. 2010; 11:207–218. DOI: 10.1007/s11121-009-0162-9 [PubMed: 20012200]

Fromme K, Katz EC, Rivet K. Outcome Expectancies and Risk-Taking Behavior. Cognitive Therapy & Research. 1997; 21(4):421–442.

Gadermann AM, Guhn M, Zumbo BD. Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. Practical Assessment, Research & Evaluation. 2012; 17(3):1–13.

Gerbing D, Anderson J. On the meaning of within-factor correlated measurement errors. Journal of Consumer Research. 1984; 11:572–580.

Gerrard M, Gibbons FX, Houlihan AE, Stock ML, Pomery EA. A dual-process approach to health risk decision making: The prototype willingness model. Developmental Review. 2008; 28(1):29–61. DOI: 10.1016/j.dr.2007.10.001

Gibbons FX, Gerrard M, Blanton H, Russell DW. Reasoned action and social reaction: Willingness and intention as independent predictors of health risk. Journal of Personality and Social Psychology. 1998; 74(5):1164–1180. DOI: 10.1037/0022-3514.74.5.1164 [PubMed: 9599437]

Hair EC, Park MJ, Ling TJ, Moore KA. Risky behaviors in late adolescence: Co-occurrence, predictors, and consequences. Journal of Adolescent Health. 2009; 45(3):253–261. [PubMed: 19699421]

Hennessy M, Bleakley A, Fishbein M, Brown L, DiClemente R, Romer D, … Salazar L. Differentiating between precursor and control variables when analyzing reasoned action theories. AIDS and Behavior. 2010; 14(1):225–236. [PubMed: 19370408]

Holbert RL, Stephenson M. The importance of indirect effects in media effects research: Testing for mediation in structural equation modeling. Journal of Broadcasting and Electronic Media. 2003; 47:556.

Hyde MK, White KM. Are organ donation communication decisions reasoned or reactive? A test of the utility of an augmented theory of planned behaviour with the prototype/willingness model. British Journal of Health Psychology. 2010; 15(2):435–452. [PubMed: 19769797]

Jenner EA, Watson P, Miller L, Jones F, Scott G. Explaining hand hygiene practice: an extended application of the Theory of Planned Behaviour. Psychology, Health & Medicine. 2002; 7(3):311–326. DOI: 10.1080/13548500220139412

Jessor R. Risk behavior in adolescence: A psychosocial framework for understanding and action. Journal of adolescent Health. 1991; 12(8):597–605. [PubMed: 1799569]

Johnston KL, White KM. Binge-Drinking: A Test of the Role of Group Norms in the Theory of Planned Behaviour. Psychology & Health. 2003; 18(1):63–77.

Kim MS, Hunter J. Relationships among attitudes, behavioral intentions, and behavior. Communication Research. 1993; 20(2):331–364. DOI: 10.1177/009365093020003001

Langdridge D, Sheeran P, Connolly K. Analyzing additional variables in the theory of reasoned action. Journal of Applied Social Psychology. 2007; 37(8):1884–1913.

Leach M, Hennessy M, Fishbein M. Perception of easy-difficult: attitude or self-efficacy? Journal of Applied Social Psychology. 2001; 31(1):1–20.

Lheureux F, Auzoult L, Charlois C, Hardy-Massard S, Minary JP. Traffic offences: planned or habitual? Using the Theory of Planned Behaviour and habit strength to explain frequency and magnitude of speeding and driving under the influence of alcohol. British Journal of Psychology. 2015

Little T, Cunningham W, Shahar G, Widaman K. To parcel or not to parcel: exploring the question, weighing the merits. Structural Equation Modeling. 2002; 9(2):151–173.

Madden TJ, Ellen PS, Ajzen I. A Comparison of the Theory of Planned Behavior and the Theory of Reasoned Action. Personality and Social Psychology Bulletin. 1992; 18(1):3–9. DOI: 10.1177/0146167292181001

Manning M. The effects of subjective norms on behaviour in the theory of planned behaviour: a meta-analysis. British Journal of Social Psychology. 2009; 48:649–705. [PubMed: 19187572]

Marcia JE. Identity in adolescence. Handbook of adolescent psychology. 1980; 9(11):159–187.

Marcoux B, Shope J. Application of the Theory of Planned Behavior to adolescent use and misuse of alcohol. Health Education Research. 1997; 12(3):323–331.

McEachan R, Taylor N, Harrison R, Lawton R, Gardner P, Conner M. Meta-Analysis of the Reasoned Action Approach (RAA) to Understanding Health Behaviors. Annals of behavioral medicine. 2016; 50(4):592–612. DOI: 10.1007/s12160-016-9798-4 [PubMed: 27169555]

Meyers-Levy J, Malaviya P. Consumers' Processing of Persuasive Advertisements: An Integrative Framework of Persuasion Theories. Journal of Marketing. 1999; 63:45–60.

Moshman, D. Adolescent psychological development: Rationality, morality, and identity. Florence, Kentucky Psychology Press; 2011.

Paquin RS, Keating DM. Fitting identity in the reasoned action framework: A meta-analysis and model comparison. The Journal of Social Psychology. 2017; 157(1):47–63. DOI: 10.1080/00224545.2016.1152217 [PubMed: 26886500]

Pepper JK, Reiter PL, McRee A-L, Cameron LD, Gilkey MB, Brewer NT. Adolescent Males' Awareness of and Willingness to Try Electronic Cigarettes. Journal of Adolescent Health. 52(2): 144–150. DOI: 10.1016/j.jadohealth.2012.09.014

Plows SE, Smith F, Smith J, Chapman C, La Macchia S, Louis W. Healthy eating: A beneficial role for perceived norm conflict? Journal of Applied Social Psychology. 2017; 47:295–304. DOI: 10.1111/jasp.12430

Reyna V, Farley F. Risk and rationality in adolescent decision making. Psychological Science in the Public Interest. 2006; 7(1):1–44. [PubMed: 26158695]

Rivis A, Abraham C, Snook S. Understanding young and older male drivers' willingness to drive while intoxicated: The predictive utility of constructs specified by the theory of planned behaviour and the prototype willingness model. British Journal of Health Psychology. 2011; 16(2):445–456. [PubMed: 21489069]

Rivis A, Sheeran P. Descriptive norms as an additional predictor in the theory of planned behaviour: a meta-analysis. Current Psychology. 2003; 22(3):218–233.

Rivis A, Sheeran P, Armitage CJ. Augmenting the theory of planned behaviour with the prototype/willingness model: Predictive validity of actor versus abstainer prototypes for adolescents' health-protective and health-risk intentions. British Journal of Health Psychology. 2006; 11(3):483–500. DOI: 10.1348/135910705X70327 [PubMed: 16870057]

Roberto A, Meyer G, Boster F, Roberto H. Adolescents' Decisions About Verbal and Physical Aggression. Human Communication Research. 2003; 29(1):135–147.

Tal-Or N, Cohen J. Understanding audience involvement: Conceptualizing and manipulating identification and transportation. Poetics. 2010; 38(4):402–418.

Todd J, Kothe E, Mullan B, Monds L. Reasoned versus reactive prediction of behaviour: a meta-analysis of the prototype willingness model. Health Psychology Review. 2016; 10(1):1–24. DOI: 10.1080/17437199.2014.922895 [PubMed: 26824678]

Tolman RM, Edleson JL, Fendrich M. The Applicability of the Theory of Planned Behavior to Abusive Men's Cessation of Violent Behavior. Violence and Victims. 1996; 11(4):341–354. [PubMed: 9210276]

van der Linden S. Charitable Intent: A Moral or Social Construct? A Revised Theory of Planned Behavior Model. Current Psychology. 2011; 30(4):355–374. DOI: 10.1007/s12144-011-9122-1

Webb T, Sheeran P. Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. Psychological Bulletin. 2006; 132(2):249–268. DOI: 10.1037/0033-2909.132.2.249 [PubMed: 16536643]

Welsh W, Gordon A. Cognitive mediators of aggression Test of a causal model. Criminal Justice and Behavior. 1991; 18(2):125–145.

Wilson C, Woolfson LM, Durkin K, Elliott MA. The impact of social cognitive and personality factors on teachers' reported inclusive behaviour. British Journal of Educational Psychology. 2016; :n/a–n/a. DOI: 10.1111/bjep.12118

Wood W. Attitude Change: Persuasion and Social Influence. Annual Review of Psychology. 2000; 51(1):539–570.

Wood W, Kallgren CA, Preisler RM. Access to attitude-relevant information in memory as a determinant of persuasion: The role of message attributes. Journal of Experimental Social Psychology. 1985; 21(1):73–85.

Yzer M. Perceived behavioral control in reasoned action theory: a dual aspect interpretation. The Annals of the American Academy of Political and Social Science. 2012; 640(March):101–117.

Yzer, M. Reasoned action theory: Persuasion as belief-based behavior change. In: Dillard, JP., Shen, L., editors. The Sage handbook of persuasion: Developments in theory and practice. Los Angelede, CA: Sage; 2013. p. 120-136.

Yzer M, Hennessy M, Fishbein M. The usefulness of perceived difficulty for health research. Psychology, Health & Medicine. 2004; 9(2):149–162.

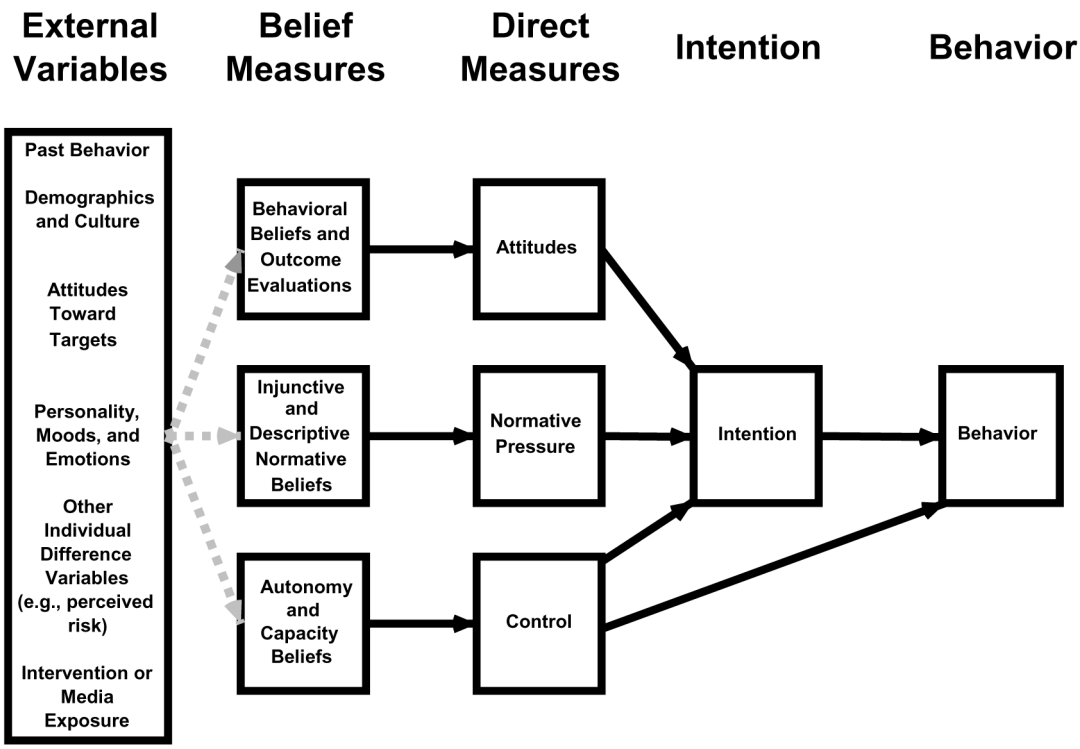


Figure 1.
The Reasoned Action Approach

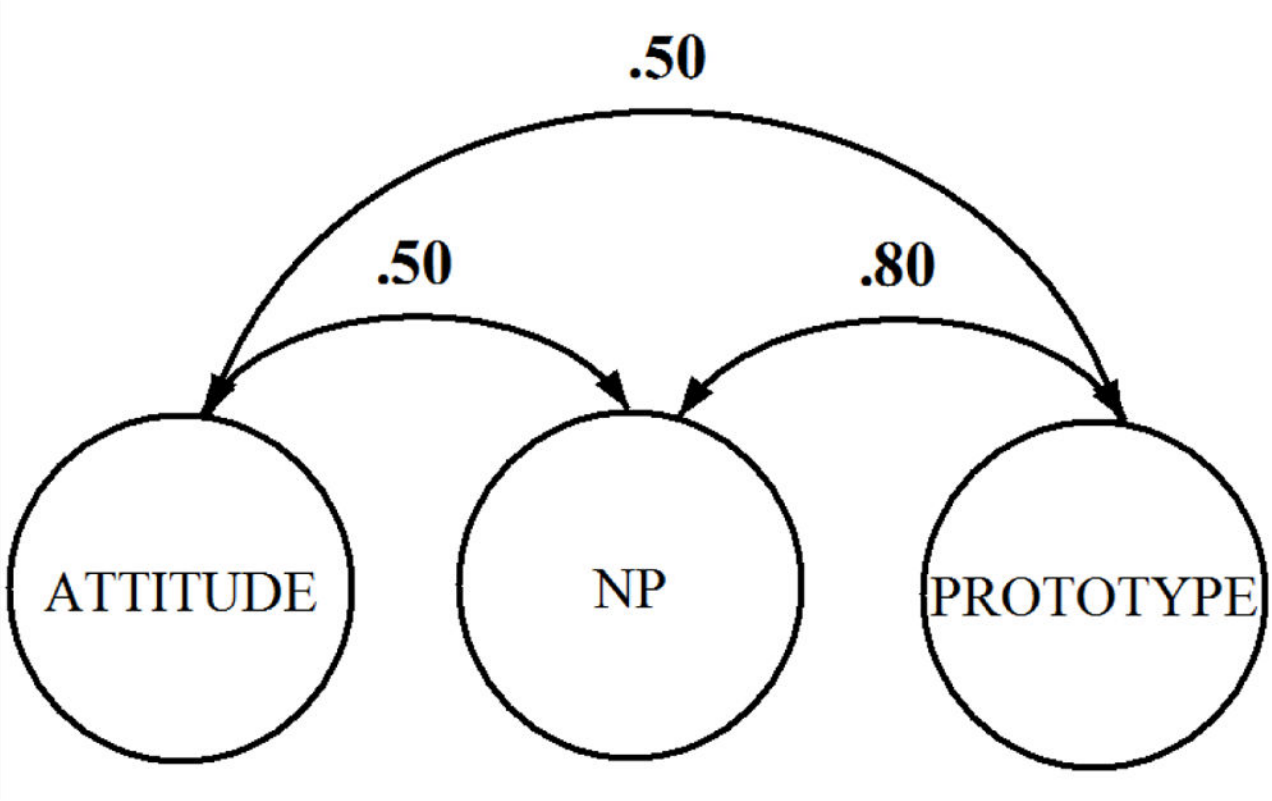
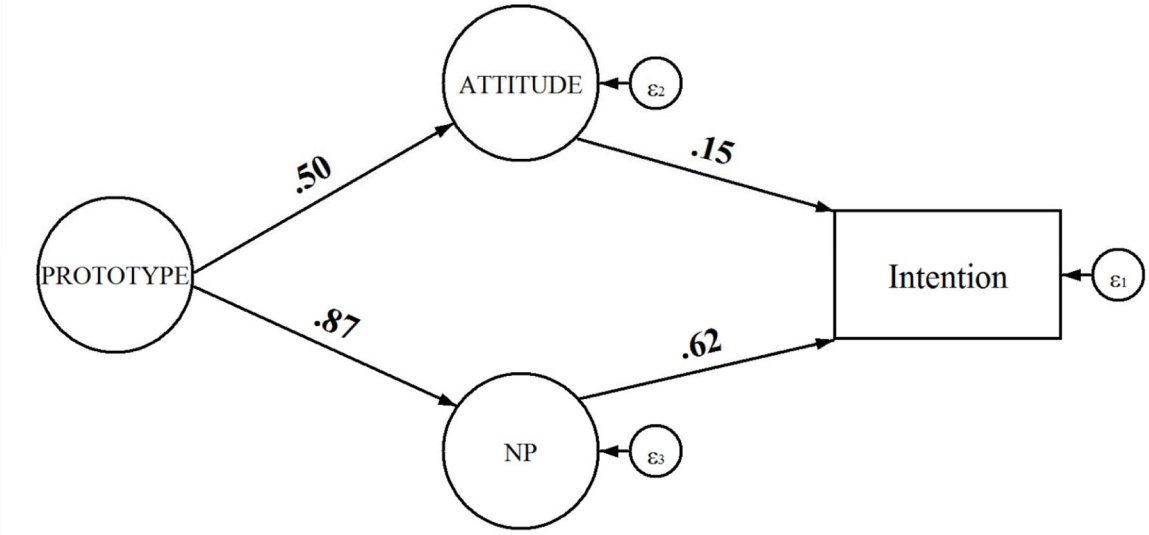


Figure 2.
Three Latent Factor Measurement Model
Notes: Attitude: 5 semantic differential items from Table 2. NP: 2 norm items from Table 2. Prototype: Favorability and Similarity items from Table 3. RMSESA = .054 (0.045 .062). CFI = .983. N = 1889. All correlations are statistically significant at $p < .05$.

Model A: Mediated Precursor



Model B: Unmediated Precursor

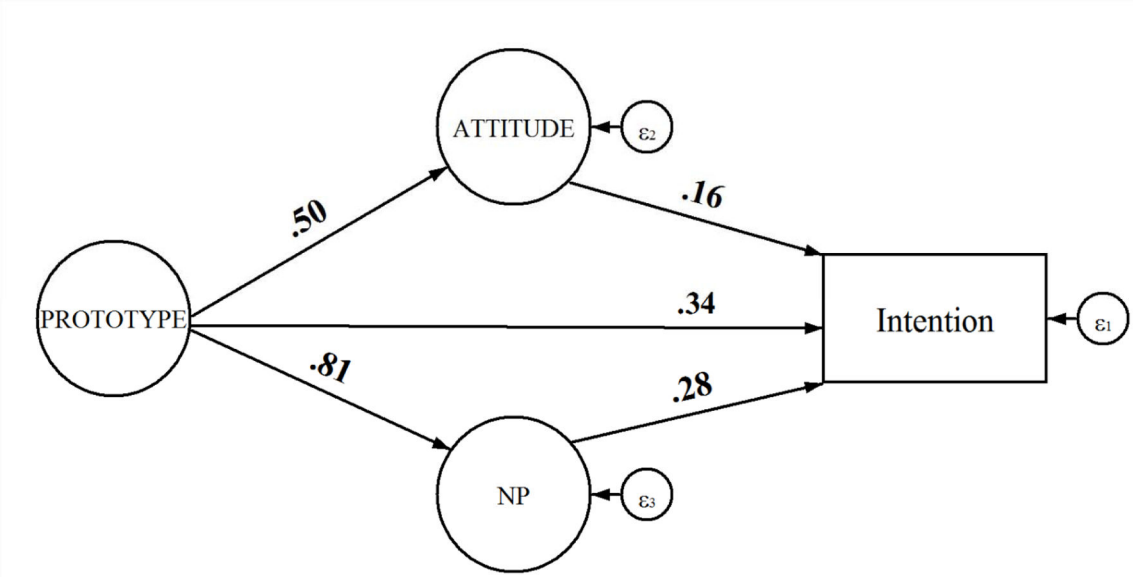


Figure 3.

The Reasoned Action Model with PROTOYPE as a Precursor Variable

Model A: Correlation between reasoned action mediator errors (.21) not shown for clarity. Intention $R^{2} = .50$. RMSEA = .056 (.049 .063) CFI = .980. Model B: Correlation between reasoned action mediator errors (. 20) not shown for clarity. Intention $R^{2} = .47$. RMSEA = . 052 (.045 .060) CFI = .983. Estimates are standardized regression coefficients. All are statistically significant at $p < .05$.

Table 1

Polychoric Correlations Between Reasoned Action, Prototype Measures and Intention (N = 1891)

SD: bad/good									
0.75	SD: foolish/wish								
0.90	0.71	SD: notenjoy/enjoyable							
0.50	0.71	0.56	SD: boring/exciting						
0.73	0.91	0.69	0.72	SD: harmful/beneficial					
0.50	0.60	0.50	0.45	0.59	Injunctive Norm				
0.36	0.44	0.44	0.43	0.42	0.71	Descriptive Norm			
0.45	0.55	0.47	0.43	0.53	0.67	0.60	Prototype: Favorability		
0.44	0.54	0.49	0.47	0.53	0.66	0.65	0.78	Prototype: Similarity	
0.52	0.63	0.58	0.53	0.63	0.67	0.62	0.67	0.71	Intention

Table 2

Confirmatory Factor Analysis Results

	Reasoned Action: Attitude Construct							Reasoned Action: Normative Pressure Construct						
	Semantic Differential Items*					Prototype Measures**		Type of Norm Measures**#		Prototype Measures**		Fit Indices		
	B/G	F/W	NE/E	B/E	H/B	Favorability	Similarity	Injunctive	Descriptive	Favorability	Similarity	RMSEA	CI	CFI
1	.50	.87	.61	.57	.89	-	-	.82	.62	-	-	.059	.047 .071	.987
2	.50	.87	.58	.59	.88	.42	-	.82	.62	-	-	.124	.115 .133	.920
3	.50	.87	.61	.58	.89	-		.78	.61	.67	-	.057	.048 .067	.983
4	.50	.87	.59	.59	.88	-	.43	.82	.62	-	-	.129	.120 .138	.915
5	.50	.87	.61	.58	.88	-	-	.77	.62	-	.68	.067	.057 .076	.977
6	.50	.87	.58	.59	.87	.43	-	.76	.61	-	.69	.151	.143 .159	.861
7	.50	.86	.55	.60	.86	.47	.48	.82	.62	-	-	.174	.166 .182	.816
8	.50	.87	.61	.58	.88	-	-	.69	.56	.78	.79	.071	.063 .079	.970

Notes:

*B/G: Bad-Good F/W: Foolish-Wise, NE/E: Not Enjoyable-Enjoyable, B/E: Boring-Exciting, H/B: Harmful-Beneficial.

**See text for item wordings.

#Unstandardized coefficients constrained to equality for identification purposes. N = 1889. Estimates are standardized regression coefficients. All are statistically significant at $p < .05$.