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Health Psychology

Why Do Even Strong Intenders Sometimes Fail to Act? Evidence From Protection, Detection, and Risk Health Behaviors

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Online First Publication, November 21, 2024. https://dx.doi.org/10.1037/hea0001446

Why Do Even Strong Intenders Sometimes Fail to Act? Evidence From Protection, Detection, and Risk Health Behaviors

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Objective: Behavioral intentions are one of the strongest predictors of health behavior. The current research explored the factors predicting action in those with already strong intentions (i.e., those with the most extreme intention scores). *Method:* Across four studies on different types of health behavior (physical activity, bowel screening, smoking initiation, COVID-19 protection behaviors), attitudes, norms, perceived behavioral control and past behavior (plus habit in Study 4) were tested as prospective predictors of action in the subsample of participants with extreme (strong) intentions. *Results:* In Studies 1 ($N = 392$) and 2 ($N = 808$) among strong intenders, norms and past behavior were consistent predictors of engaging in objectively assessed physical activity and bowel screening, respectively. In Studies 3 ($N = 4,148$) and 4 ($N = 445$) among strong intenders, affective attitudes (only Study 3), descriptive norms, capacity/autonomy, and past behavior were predictors of resisting smoking initiation and engaging in COVID-19 protection behaviors, respectively. Study 4 also showed habit to be a significant predictor of action in strong intenders. *Conclusion:* This research identifies factors that might be useful targets to promote engagement with health behaviors in those with already strong intentions to act. Future research could usefully test whether targeting these same variables translates into behavior change in those with already strong intentions to act.

Public Significance Statement
Relatively little is known about what predicts engaging in health behaviors in those with already strong (extreme) intentions. Four studies of physical activity, bowel screening, adolescent smoking initiation, and engagement in COVID-19 protection behaviors tested such predictors. Norms and past behavior were consistently identified as predicting engaging in these behaviors in those with already strong intentions to act.

Keywords: intention–behavior gap, strong intentions, health behavior

Supplemental materials: https://doi.org/10.1037/hea0001446.supp

Behavioral intentions have been identified as key proximal determinants of action in a range of theories used to predict health behaviors (e.g., theory of planned behavior [TPB], Ajzen, 1991; reasoned action approach [RAA], Fishbein & Ajzen, 2010; protection motivation theory, Rogers, 1983; social cognitive theory, Bandura, 1997). Meta-analyses support the view that behavioral intentions are the strongest predictors of action, explaining between 18% and 23% of the variance in action across a broad range of behaviors (Armitage & Conner, 2001) or health behaviors in particular (Hagger & Hamilton, 2023; R. McEachan et al., 2016; R. R. C. McEachan et al., 2011). However, these meta-analyses also indicate that intention only explains a minority of the variance in health behaviors (e.g., only 18% in R. R. C. McEachan et al., 2011). Similarly, experimental studies also indicate a less-than-perfect relationship between intention and action. For example, Webb and Sheeran (2006) showed that interventions producing medium-to-large-sized changes in intentions were associated with only small-to-medium-sized changes in action.

These findings highlight what has been termed the intention–behavior gap (Godin & Conner, 2008; Rhodes & de Bruijn, 2013; Sheeran, 2002). One approach to bridging this gap has been to

explore moderators of the intention–health behavior relationship (see Conner & Norman, 2022; Rhodes et al., 2022; Sheeran & Webb, 2016; Webb & Sheeran, 2006 for reviews). However, as Sheeran (2002) noted, the intention–behavior gap is not symmetrical, with the majority of the gap being attributable to positive intenders who subsequently fail to act. Studies indicate that while the vast majority of nonintenders do not act (97%–98%; Rhodes & de Bruijn, 2013; Sheeran, 2002), only a minority of positive intenders do act (42%–26%; Rhodes & de Bruijn, 2013; Sheeran, 2002). As positive intentions become more extreme (i.e., stronger) the likelihood of action increases, although even among those with the strongest (most extreme) intentions, the gap between intentions and action may remain substantial. For example, Conner and Norman (2022) reported one study on physical activity where the percentage acting (engaging in the recommended amount of physical activity) was only 35% in intenders (i.e., among those scoring above 4 on a 7-point scale). The likelihood of acting was 28% in those scoring 5 on the scale (weak intenders), 33% in those scoring 6 (moderate intenders), and 51% in those scoring 7 on the scale (strong intenders). Nevertheless, nearly half (49%) of those with the most extreme intentions (i.e., strong intenders) to perform this behavior still failed to do so.

These findings highlight the potential value of focusing research attention on strong intenders (i.e., those with the most extreme positive intentions) and the reasons why they fail to act. Understanding such factors may provide useful insights into how to intervene with a group who would appear to already be strongly motivated to act (as indicated by their extreme intentions). The current research therefore focused on a subgroup of positive intenders, those with strong intentions (i.e., positive intenders who have the most extreme intentions), and explored the variables that distinguish between whether they subsequently do or do not act.

There are three principal reasons to focus on predicting behavior only in those with the most extreme positive intention scores (i.e., strong intenders). The first is definitional. In using extremity as a measure of strength, by definition, those with the strongest positive intenders are those with the maximum score. Second, by focusing on a group where intention is a maximum and at a constant value, intention does not need to be controlled for in the analyses (and mediation and moderation tests involving intentions cannot be conducted). In effect, this is a group where interventions that attempt to increase intentions are unlikely to be effective (as intentions are already at a maximum) and a focus on discovering what other variables might drive behavior becomes most relevant. Third, holding an extreme positive intention is not unusual for many health behaviors (e.g., adolescents avoiding smoking intentions), that is, intention scores are often not normally distributed. As such, further study of the predictors of action in strong intenders may be warranted and could usefully inform intervention efforts for this group. Based on these reasons the current research focused on predicting action in strong intenders defined as those with the most extreme positive intentions.

Predictors of Action in Strong Intenders

Although a range of factors might predict action in those with strong intentions to act, variables previously identified as having direct effects on action independently of intentions may offer one useful focus. Although the TPB (Ajzen, 1991) and RAA (Fishbein & Ajzen, 2010) both identify intentions as the sole proximal determinant of action, various primary empirical studies and meta-analyses suggest that other variables can directly influence action independently of intentions. Four such variables were considered here, three taken from the TPB/RAA (i.e., attitudes, norms, perceived behavioral control) and one external variable (i.e., past behavior/habit).

Although theoretical accounts of the TPB/RAA predict that perceived behavioral control (i.e., perceptions of the degree to which behavior is within one's control) has effects on behavior mediated through intentions or moderated effects through changing the intention–behavior relationship, a considerable number of primary studies and meta-analyses support a direct effect of perceived behavioral control on action. For example, Armitage and Conner (2001) indicated that perceived behavioral control explained a significant additional 2% of variance in action over and above the effects for intentions. This would suggest that even among strong intenders, increasing levels of perceived behavioral control might be associated with a greater likelihood of action. This would be consistent with Bandura's (1997) social cognitive theory that suggests self-efficacy (a concept similar to perceived behavioral control) as having direct effects on action independent of intentions. Bandura proposed that this might be attributable to those with higher self-efficacy trying harder or persisting longer. The RAA (Fishbein & Ajzen, 2010) splits perceived behavioral control into capacity (i.e., one's confidence to engage in the behavior) and autonomy (i.e., perceived control over whether or not to engage in the behavior). Meta-analyses of the RAA (e.g., R. McEachan et al., 2016) indicate that capacity but not autonomy, predicts action independently of intentions. This might suggest capacity in particular as a predictor of action in those with strong intentions.

The case for attitudes (i.e., overall evaluations of the behavior) and norms (i.e., beliefs about whether significant others think one should or should not engage in a behavior) predicting action in those with strong intentions is less clear-cut. The majority of TPB studies and meta-analyses of such studies (e.g., R. R. C. McEachan et al., 2011) confirm predictions from the theory that the effects of attitudes and norms on action are fully mediated by intentions. This would suggest that neither is likely to impact action in those with strong intentions. In the RAA, attitudes are split into affective attitudes (i.e., the belief that engaging in the behavior would be pleasant) and cognitive attitudes (i.e., the belief that engaging in the behavior would be beneficial), whereas norms are split into injunctive norms (i.e., the belief that others would approve of the individual engaging in the behavior) and descriptive norms (i.e., the belief that others engage in the behavior). Meta-analyses of the RAA support the idea that affective attitudes (but not cognitive attitudes) and descriptive norms (but not injunctive norms) directly influence action independently of intentions (R. McEachan et al., 2016). The exact basis for these direct effects is not entirely clear, although for affective attitudes this may reflect more impulsive influences on action, while for descriptive norms it might reflect modeling of other's behavior (R. McEachan et al., 2016). In both cases, these influences may occur independent of the careful consideration of action that intentions presumably capture and so occur even in strong intenders. These findings from the RAA (R. McEachan et al., 2016) might suggest that affective attitudes and descriptive norms (but not cognitive attitudes or injunctive norms) directly predict action in those with strong intentions. In addition, to the extent that overall attitude measures

strongly reflect affective attitudes and overall norms strongly reflect descriptive norms then we might also expect attitudes and norms to predict behavior in those with strong intentions. The case for these predictions may be stronger in relation to norms. The contingent-consistency hypothesis (Acock & DeFleur, 1972; Grube & Morgan, 1990; Rabow et al., 1987; Terry et al., 2000) suggests that attitudes and perhaps intentions are stronger predictors of action when the social environment (i.e., norms) is perceived to be supportive. The contingent-consistency hypothesis can also be interpreted as predicting that individuals will act more in accord with their norms when they have strong attitudes or intentions.

A final variable that might be predictive of action in those with strong intentions is past behavior or habit. A variety of studies show the frequency of past behavior to have a similar (if not larger) sized effect to intentions on future action (see Ajzen, 1991; Conner & Armitage, 1998; Ouellette & Wood, 1998). In particular, meta-analyses of the TPB/RAA (e.g., R. R. C. McEachan et al., 2011) show that frequency measures of past behavior have a direct effect on action when controlling for intentions, with the size of effect being similar to that for intentions. Although the explanatory value of past behavior has been questioned (e.g., Ajzen, 1991, 2002), to the extent that the repeated performance of a behavior leads to the formation of a habitual response, such that the action comes under the control of stimulus cues and is performed automatically with little effort or conscious awareness, past behavior may be a useful predictor of action even in those with strong intentions. In addition, more direct measures of habit that tap the automatic nature of action (Gardner et al., 2012) might be particularly likely to predict action in those with strong intentions.

Tests of Predictions in Different Types of Health Behavior

The current research tested attitude, norms, perceived behavioral control, and past behavior/habit as predictors of action among those with strong intentions in several different health behaviors in order to assess the degree of generalizability of any findings. In selecting the health behaviors in which to test these predictions we were mindful of broad classifications of types of health behaviors (e.g., Prestwich et al., 2024) and the limited amount of research showing this distinction reflects differences in the power of predictors (e.g., Conner et al., 2017). In particular, we examined effects separately in protection (physical activity, Study 1; COVID-19 protection behaviors, Study 4), detection (bowel screening kit return, Study 2), and risk (smoking initiation, Study 3) health behaviors to explore whether any observed effects were generalizable. Study 1 and Study 2 used variables from the TPB (i.e., attitude; norms; perceived behavioral control; past behavior), while Study 3 and Study 4 used variables from the RAA (affective and cognitive attitude; injunctive and descriptive norms; capacity and autonomy; past behavior). Study 4 also included a measure of habit (i.e., assessed as perceived automaticity; Gardner et al., 2012) as well as the frequency of past behavior and also used a multibehavior design that allows tests of average effects within individuals across behaviors. In addition, Studies 1 and 2 used objective measures of action (and past behavior).

In summary, across four studies looking at different types of health behavior, we examined the predictors of action among those with strong intentions to act. The set of predictors examined comprised attitude (overall, Studies 1 and 2; affective and cognitive, Studies 3 and 4), norms (overall, Studies 1 and 2; injunctive and descriptive, Studies 3 and 4), perceived behavioral control (overall, Studies 1 and 2; capacity and autonomy, Studies 3 and 4), and past behavior (frequency, Studies 1–4; habit, Study 4). To the extent that the four studies identified consistent predictors of action in strong intenders, they might constitute useful targets for interventions to help those with strong intentions to follow through on these intentions and act.

Study 1: Health Protection Behavior (Physical Activity)

Study 1 was designed to provide a first test of attitude, norms, perceived behavioral control, and frequency of past behavior as predictors of action in strong intenders for a protection behavior (physical activity). Both past behavior and action were objectively assessed in this study. The study received ethical approval from a local university ethics committee and all standard American Psychological Association (APA) ethical procedures were followed. Data for the present study form part of a larger project with only data relevant to the present research described here. None of the data from this study have been previously published. Full details of all measures and the data set are available from Mark Conner.

Method

Sample

The study population consisted of student members of a sports center at a large university in the north of England who were sent an email inviting them to participate in an online survey in the autumn a few weeks after the start of the academic year (October–November 2011). A total of 392 participants (259 female, 133 male, age: $M = 21.1$, $SD = 3.97$) fully completed the questionnaire and were included in the analyses.

Measures

Participants completed questions about the target behavior (i.e., regularly exercising in the sports center over the next few months). The questionnaire items tapped intentions (one item, e.g., "I will exercise at least 3 times per week in the sports center in the next few months," strongly disagree–strongly agree), attitude (seven items, e.g., "For me, exercising at least 3 times per week in the sports center in the next few months would be …," harmful–beneficial; $\alpha = .91$), subjective norm (two items, e.g., "Most people who are important to me think that I should exercise at least 3 times per week in the sports center in the next few months," strongly disagree–strongly agree; $r = .74$), and perceived behavioral control (three items, e.g., "I am confident I can exercise at least 3 times per week in the sports center in the next few months," strongly disagree–strongly agree; $\alpha = .84$), all assessed on 7-point scales. An objective measure of action (average number of entries to the sports center per week based on a swipe card entry system) was obtained for each participant from records. Data across the 3 weeks prior to questionnaire completion were used as a measure of past behavior, while data across the 2 weeks subsequent to questionnaire completion were used as a measure of the key outcome variable, action.

(P. Edwards et al., 2005; P. J. Edwards et al., 2009) suggest that financial incentives almost doubled the rate of returning a postal questionnaire. In the current study, the return rate was significantly higher for the screening questionnaire plus incentive compared to the screening-only questionnaire, an increase of 12.6%, $\chi^2(1) = 172.48$, $p < .001$. However, there were no effects of incentive on the main results and it was controlled for in the analyses reported.

Measures

Participants completed questions about the target behavior (i.e., using and returning a bowel screening kit). The questionnaire items tapped intentions (two items, e.g., "I will use the bowel screening kit I am being sent," strongly disagree–strongly agree; $r = .74$), attitude (two items, e.g., "For me, using the bowel screening kit would be …," harmful–beneficial, unhealthy–healthy; $r = .68$), subjective norm (one item, "People who are important to me would approve/disapprove of my using the bowel screening kit," disapprove–approve), and perceived behavioral control (one item, "I am confident I can use the bowel screening kit," strongly disagree–strongly agree), all assessed on 7-point scales. An objective measure of action (return of the bowel screening kit) was obtained for each participant from records. Return of a bowel screening kit in response to any previous invitation was used as a measure of past behavior, while return of a bowel screening kit in response to the current invitation was used as a measure of the key outcome variable, action. Full details of all measures for this study are available from Mark Conner.

Data Analysis

The main analyses focused on the return of the bowel screening kit only in the group with strong intentions. Simple correlation and logistic regression were used to predict kit return from attitude, subjective norm, perceived behavioral control, and past behavior. For the regression, model fit (-2 log-likelihood; Nagelkerke R^2) plus odds ratio, 95% confidence interval, and significance are reported for each predictor variable. We also report the proportion returning the bowel screening kit in the strong intenders group. As in Study 1, for comparison purposes, these same analyses (including intention) are reported for the full sample and positive intenders subsample (Tables 1 and 2 in the online supplemental materials).

Results

The average screening rate was 95.5% in all participants ($N = 808$), 96.1% in the subgroup with positive intentions ($N = 797$), and 96.8% in the subgroup with strong intentions ($N = 651$). This indicated that the screening rate increased as expected from the full sample to the subgroup with positive intentions and then further in the group with strong intentions, although rates were high in all groups.

Table 1 shows that in the subgroup with strong intentions ($N = 651$), subjective norms and past behavior, but not attitude or perceived behavioral control were significantly correlated with bowel screening kit return. When entered simultaneously in a logistic regression analysis, subjective norms and past behavior were each significant independent predictors of action, explaining 8.1% of the variance in behavior. Stronger subjective norms and more past behavior were associated with greater odds of bowel screening kit return (Table 1). This would suggest that each of subjective norms and past behavior contribute to enacting a strong intention for an objectively assessed detection behavior (i.e., bowel screening).

Supplementary analyses showed the correlation between intentions and action was .25 in the full sample ($N = 808$) and .06 in the positive intenders sample ($N = 797$), with attitude, norms, perceived behavioral control, past behavior, and intentions explaining 17.5% of the variance in action in the full sample and 10.8% in the positive intenders subsample (Tables 1 and 2 in the online supplemental materials).

Study 3: Health Risk Behavior (Smoking Initiation)

Study 3 was designed to replicate the findings of Studies 1 and 2 in a different sample and in relation to a health risk behavior (self-reported smoking initiation). Study 3 extended Studies 1 and 2 by examining RAA variables in relation to smoking initiation in adolescents. Measures of cognitive versus affective attitudes, injunctive versus descriptive norms, and capacity versus autonomy were used as predictors of action alongside past behavior. We particularly predicted that affective attitudes, descriptive norms, capacity, and past behavior would be predictive of action in the subgroup with strong intentions. The study received ethical approval from a local university ethics committee and all standard APA ethical procedures were followed. The current data have not been previously reported, but are part of a larger randomized controlled trial testing implementation intentions as an intervention to reduce smoking initiation (Conner et al., 2019). Only data relevant to the present research are described here and are available from Mark Conner.

Sample

The study population consisted of adolescents from a single school year in 45 schools in the United Kingdom. Adolescents completed questionnaires each year over a 4-year time period. Responses were completed anonymously and matched across time points using a personally generated code. The current analyses used data from baseline when adolescents were aged 11–12 years (September 2012–January 2013) to predict smoking at final follow-up (September–December 2016) when they were aged 15–16 years (i.e., the maximum duration available). There were no effects of condition (implementation intention or not; Conner et al., 2019) on the main results and it was controlled for in the analyses reported.

A total of 4,148 participants (2,161 female, 1,987 male, age: $M = 11.2$, $SD = 0.42$ at baseline) fully completed the questionnaire and were included in the analyses.

Measures

Participants completed questions about the target behavior (i.e., not initiating smoking). The questionnaire items tapped intentions (three items, e.g., "I plan not to smoke," strongly disagree–strongly agree; $\alpha = .77$), cognitive attitude (three items, e.g., "For me, not smoking would be …," harmful–beneficial; $\alpha = .48$; the single quoted item was used as the set of items did not form a reliable scale), affective attitude (three items, e.g., "For me, not smoking

would be …," unpleasant–pleasant; α = .87), injunctive norm (five items, e.g., "People who are important to me think I should not smoke," strongly disagree–strongly agree; α = .73), descriptive norm (sum of number of family members or friends who smoke [reversed]), capacity (six items, e.g., "I can say no to smoking even when I am the only one in the group not smoking," strongly disagree–strongly agree; α = .94), and autonomy (three items, e.g., "I have control over not smoking," strongly disagree–strongly agree; α = .45; the single quoted item was used as the set of items did not form a reliable scale), all assessed on 5-point scales. Smoking was assessed using a standardized measure (Jarvis, 1997) at both time points; adolescents ticked one of: "I have never smoked; I have only tried smoking once; I used to smoke sometimes, but I never smoke cigarettes now; I sometimes smoke cigarettes now, but I don't smoke as many as one a week; I usually smoke between one and six cigarettes a week; and I usually smoke more than six cigarettes a week." This measure was converted into a measure of never smoking (first response coded 1; other responses coded 0) at baseline (past behavior) and follow-up (action). Full details of all measures are available from Mark Conner.

Data Analysis

The main analyses focused on predicting never smoking at follow-up among the subgroups with strong intentions. Simple correlation and logistic regression were used to predict never smoking from cognitive attitude, affective attitude, injunctive norm, descriptive norm, capacity, autonomy, and past behavior. For the regression, model fit (−2 log-likelihood; Nagelkerke R^2) plus odds ratio, 95% confidence interval, and significance are reported for each predictor variable. The proportion of never smoking in the strong intenders group is also reported. As in Studies 1 and 2, for comparison purposes, these same analyses (including intention) are reported for the full sample and positive intenders subsample (Tables 1 and 2 in the online supplemental materials).

Results

The proportion of never smokers was 69.0% in all participants (N = 4,148), 69.6% in those with positive intentions (N = 4,063), and 71.7% in the strong intender group (N = 3,736). This indicated that the likelihood of being a never smoker at follow-up increased as expected from the full sample to those with positive intentions and then further in those with strong intentions not to smoke. Table 1 shows that in the subgroup with strong intentions (N = 3,736), affective attitude, injunctive and descriptive norms, capacity, and past behavior, but not cognitive attitude or autonomy were significantly correlated with never smoking. However, when entered simultaneously in a logistic regression analysis, affective attitude, descriptive norm, capacity, and past behavior were each significant independent predictors of never smoking, explaining 10.5% of the variance in behavior. Stronger affective attitudes, descriptive norms, capacity, and more past behavior were associated with greater odds of being a never smoker (Table 1). This would suggest that each of affective attitudes, descriptive norms, capacity, and past behaviors contribute to enacting a strong intention for a risk behavior (i.e., resisting smoking initiation).

In comparison, supplementary analyses showed the correlation between intentions and action was .14 in the full sample (N = 4,090) and .13 in the positive intenders sample (N = 4,009), with cognitive and affective attitude, injunctive and descriptive norms, capacity and autonomy, past behavior and intentions explaining 13.2% of the variance in action in the full sample and 12.6% in the positive intenders subsample (Tables 1 and 2 in the online supplemental materials).

Study 4: Health Protection Behavior (COVID-19 Protection Behaviors)

Study 4 was a replication of Study 3 in a different sample and in relation to a set of six health protection behaviors (self-reported COVID-19 protection behaviors). Study 4 extended Study 3 by also including a direct measure of habit. Study 4 also used a multi-behavior design to examine a set of related protection behaviors (COVID-19 protection behaviors). Measures of cognitive versus affective attitudes, injunctive versus descriptive norms, and capacity versus autonomy from the RAA were used as predictors of action alongside past behavior and habit. We predicted that specific variables (i.e., affective attitudes, descriptive norms, capacity, past behavior, habit) would be predictive of action in the subgroup with strong intentions. The study received ethical approval from a local university ethics committee and all standard APA ethical procedures were followed. The current data have not been previously reported, but are part of a previously published data set (Conner et al., 2023). Only data relevant to the present research, which are available from Mark Conner, are described here.

Sample

The study population consisted of a representative sample of U.K. adults (in relation to age, sex, and ethnicity) recruited via stratified sampling in Prolific (https://www.prolific.co) at a time when U.K. cases and death rates were high (late 2021). Participants completed online questionnaires 2 months apart, November 2021–January 2022. A total of 445 participants fully completed questionnaires at both time points (227 female, 218 male, age: M = 40.0, SD = 14.2) and were included in the analyses.

Measures

Participants completed questions about each of the target behaviors (eight COVID-19 protection behaviors recommended by the World Health Organisation, 2020): wearing a face covering in public places; maintaining social distancing of at least 1 m, hand sanitizing regularly; avoiding the three "Cs" (closed spaces, crowded places, and close contact); cleaning surfaces regularly; covering your mouth/nose when coughing/sneezing; meeting people outside rather than indoors; opening a window to increase natural ventilation.

The questionnaire items tapped intentions (three items per behavior, e.g., "Do you intend to wear a face covering in public places in the next two months? Definitely don't–Definitely do"; all scored 1–7; α = .93–.97; items averaged for each behavior), cognitive attitude (one item per behavior, e.g., "My wearing a face covering in public places in the next two months would be," harmful–beneficial), affective attitude (one item per behavior, e.g., "My wearing a face covering in public places in the next

two months would be," unpleasant–pleasant), injunctive norm (one item per behavior, e.g., "Most people close to me would disapprove/approve of me wearing a face covering in public places in the next two months," disapprove–approve), descriptive norm (one item per behavior, e.g., "Of the people close to you, how many will wear a face covering in public places in the next two months?," none–all), capacity (one item per behavior, e.g., "How confident are you that you could wear a face covering in public places in the next two months?", not at all confidence–extremely confident), autonomy (one item per behavior, e.g., "How much control do you have over whether or not you wearing a face covering in public places in the next two months?", no control–complete control), and habit/automaticity (one item per behavior, e.g., "Wearing a face covering in public places is something I do automatically," strongly disagree–strongly agree), all assessed on 7-point scales. A self-report measure of each behavior was taken (two items per behavior, e.g., "To what extent have you done each of the behaviors listed below over the past month? Not at all–All the time"; "Not worn a face covering in public places? Not at all–All the time"; both scored 1–7). Based on the skewed responses, the two items were combined to produce a dichotomous measure for each behavior: scores of 7 for engagement with protection behavior and 1 for engagement with nonprotection behavior were coded fully compliant (scored 1); all other patterns of responses were coded nonfully compliant (scored 0). At baseline, this was used as a measure of past behavior (frequency), while at follow-up this was used as the outcome variable, action. Full details of all measures for this study are available from Mark Conner.

Data Analysis

The main analyses focused on predicting action at follow-up among the subgroups with strong intentions. Simple correlation and multilevel logistic regression (Bernoulli model) were used to predict engaging in the COVID-19 protection behaviors from cognitive attitude, affective attitude, injunctive norm, descriptive norm, capacity, autonomy, habit, and past behavior (all Level 1 variables). The regression controlled for the clustering of the eight behaviors within each respondent and demographics (gender and age were Level 2 variables). For the regression, model fit (-2 log-likelihood) plus odds ratio, 95% confidence interval, and significance are reported for each predictor variable. The proportion acting in the strong intenders group is also reported. As for previous studies and to allow comparisons, these same analyses (including intention) are reported for the full sample and positive intenders subsample (Tables 1 and 2 in the online supplemental materials).

Results

The proportion of engaging in COVID-19 protection behaviors at follow-up was 24.9% in all participants ($N = 4{,}024$ person–behavior pairs), 31.5% in those with positive intentions ($N = 3{,}137$ person–behavior pairs), and 51.8% in the strong intender group ($N = 1{,}509$ person–behavior pairs). This indicated that the likelihood of engaging in COVID-19 protection behaviors increases as expected from the full sample to those with positive intentions and again to those with strong intentions.

Table 1 shows that in the group with strong intentions ($N = 1{,}509$ person–behavior pairs), cognitive attitude, affective attitude, injunctive norm, descriptive norm, capacity, autonomy, habit, and

past behavior were significantly correlated with action at follow-up. However, when entered simultaneously in a multilevel logistic regression analysis, descriptive norm, autonomy, habit, and past behavior were each significant independent predictors of action, explaining 30.0% of the variance (estimate based on non-multi-level logistic regression). Stronger descriptive norms, autonomy, habit, and more past behavior were associated with greater odds of action at follow-up (Table 1). This would suggest that each of descriptive norms, autonomy, habit, and past behavior contribute to enacting a strong intention for a group of related protection behaviors (i.e., COVID-19 protection behaviors).

Supplementary analyses showed the correlation between intentions and action was .25 in the full sample ($N = 503$, cases $= 2{,}020$) and .19 in the positive intenders sample ($N = 461$, cases $= 1{,}440$) with cognitive and affective attitude, injunctive and descriptive norms, capacity and autonomy, past behavior and intentions explaining 52.8% of the variance in action in the full sample and 45.9% in the positive intenders subsample (Tables 1 and 2 in the online supplemental materials; variance explained estimates based on non-multi-level logistic regression).

General Discussion

Across four studies the current research tested predictors of action in those with an already strong (extreme) intention to act. The most consistent predictor of action was past behavior, being significant in all four studies (Table 1) with habit also being significant in the one study it was tested in (Study 4). Norms (subjective norms in Studies 1 and 2; descriptive norms in Studies 3 and 4) were also significant predictors of action across all studies. Perceptions of control (perceived behavioral control in Study 1; capacity in Study 3; autonomy in Study 4) were significant predictors of action in three out of four studies. Finally, while overall attitudes (Studies 1 and 2) and cognitive attitudes (Studies 3 and 4) were not significant predictors, affective attitudes (Study 3) were significant predictors of action. In those with strong intentions, action was more likely when affective attitudes, norms (particularly descriptive norms), perceived behavioral control (capacity or autonomy), and past behavior (or habit) were high. In other words, strong intenders may fail to act when action is not supported by the presence of high levels of these variables. This is important because although intentions are construed as the most important predictor of behavior in several health behavior theories (e.g., Ajzen, 1991; Bandura, 1997; Fishbein & Ajzen, 2010; Rogers, 1983), evidence shows that intentions are not always translated into health actions (e.g., Sheeran & Webb, 2016). In the current research, as expected the proportion acting increased as we moved from the full sample, to positive intenders, and to strong intenders. Nevertheless, even among those with strong intentions the proportion failing to act was sometimes considerable in the current studies (3.2%–48.2%). Thus it is important for researchers and practitioners to understand why even strong intentions are more or less likely to be enacted successfully and that this is the case whether the variables predicting action are similar or different in those with and without strong intentions. The current research complements work on moderators of the intention–behavior relationship (see Rhodes et al., 2022 for a review) by showing that a

number of variables may be important in translating even strong intentions into action.

The studies reported here indicate some degree of convergence in what predicts action in those with strong intentions (i.e., past behavior/habit, norms/descriptive norms, perceived behavioral control/capacity/autonomy, affective attitudes) across four studies that included objective (Studies 1 and 2) and self-reported (Studies 3 and 4) action measures; in relation to a range of different types of health behaviors (protection: physical activity, COVID-19 protection behaviors; detection: bowel screening; risk: smoking initiation); in different samples (students, older adults, adolescents, representative sample of U.K. adults); with differing time periods between predictors and action (a few days up to 4 years); and using different designs (between participant vs. between behaviors). The studies also varied in relation to the size of the intention–behavior gap. For example, in the full sample (Table 1 in the online supplemental materials), the correlation between intention and action varied across studies ($r = .14$–$.44$) as did the percentage of variance in action explained (13.2–51.9%). Nevertheless, the pattern of findings across the studies remained similar, suggesting some degree of generalizability. It is also worth noting that the amount of variance in action left unexplained was still considerable even in the strong intenders group (59.0–91.9%; Table 1). This would suggest the need to look beyond the variables specified in the TPB/RAA plus past behavior and habit in order to explain engagement in different health behaviors in the strong intenders groups.

The four studies reported here offer the first tests of the variables that predict action in strong intenders but show a number of limitations that should be acknowledged. First, only four behaviors and four samples were examined here, and tests in relation to other health actions and other participant groups are needed to fully determine generalizability. Nevertheless, it is worth noting that the tests did include two protection, one detection, and one risk health behavior. Second, only the first two studies included objective measures of action (and past behavior). Additional studies should test these effects in further health behaviors, preferably measured objectively. Third, the studies differed in terms of the specific variables considered, in terms of focusing on TPB (Studies 1 and 2) or RAA (Studies 3 and 4) variables. We particularly specified affective attitude, descriptive norms, capacity, and habit as being important predictors of action in those with already strong intentions, and future studies might usefully focus on these variables. Fourth, the four studies were limited in terms of the range of predictor variables considered (i.e., mainly those identified by the TPB/RAA). A broader range of predictors of action in strong intenders may also be worth considering. This might include a range of variables thought to have their effect on action independently of intentions (e.g., impulsive vs. reflective influences from the reflective impulsive model, Strack & Deutsch, 2004; dispositional influences such as self-control, executive control, and conscientiousness). Fifth, and finally, it should be acknowledged that each of the present studies used correlational designs, and experimental tests that manipulate the key predictors and assess effects on change in action in strong intenders would be informative. Such an approach might also give insights into how identified variables help translate strong intentions into action. In the introduction we noted that direct effects of variables independent of intentions have been attributed to impulsive influences (affective attitudes; R. McEachan et al., 2016), modeling of other's behaviors (descriptive norms; R. McEachan et al., 2016), trying

harder or persisting (perceived behavioral control, capacity, autonomy; Bandura, 1997), or habitual influences (past behavior, habit; Gardner et al., 2012; Ouellette & Wood, 1998). Further research could therefore usefully explore intervention effects in individuals with already strong intentions to act.

Notwithstanding the limitations listed, the present research provides insights into strong intenders and what might make them act or fail to act and offers potentially fruitful directions for future research. For example, future research might usefully focus on exploring the extent to which similar findings emerge when using different measures of strong intention. Here the focus was on extremity as the most commonly used measure of strength. We selected to focus on those with the most extreme intentions (i.e., 7 on a 7-point intention scale). Conner and Norman (2022) discuss a number of other measures of intention strength including response latency, importance, and certainty judgments. Whether similar or different variables emerge as predictors of action in those with strong intentions defined in these different ways would be a useful focus for future research.

The present findings also have implications for the implementation of interventions to change health behaviors. While previous research has tended to focus on the best ways to strengthen health-related behavioral intentions (e.g., Webb & Sheeran, 2006), the results obtained here suggest that this can be usefully supplemented by targeting other predictors of action. The key insight provided by the present research is that intervention may still be valuable—targeting variables such as affective attitude, descriptive norms, capacity, and habit—even when intention scores are already maximized. Sheeran and Conner (2017) make a similar point in relation to promoting motivational coherence even in strong intenders. Thus, interventionists and practitioners should consider targeting variables such as attitudes, norms, and perceived behavioral control, not just in order to produce strong intentions but also because this may help even those with strong intentions translate those intentions into action.

Conclusion

In conclusion, the current research shows the value of exploring the power of TPB/RAA variables plus past behavior/habit as predictors of action in those with already strong (extreme) intentions. Past behavior/habit, social norms/descriptive norms, perceived behavioral control/capacity/autonomy, and affective attitudes emerged as significant predictors of action in those with strong intentions. Future research could usefully examine a broader range of predictor variables in those with strong intentions and consider the manipulation of these variables in this group while observing effects on (objectively assessed) action.

Resumen

Objetivo: Las intenciones conductuales son uno de los predictores más fuertes del comportamiento de salud. La investigación actual exploró los factores que predicen la acción en aquellos que ya tienen intenciones fuertes (es decir, aquellos con puntuaciones de intención más extremas). ***Métodos:*** En cuatro estudios sobre diferentes tipos de conductas de salud (actividad física, detección intestinal, inicio de tabaquismo, conductas de protección contra el COVID-19), se probaron como predictores potenciales de acción las actitudes, las normas, el control conductual percibido y la conducta pasada

(más el hábito en el Estudio 4) en la submuestra de participantes con intenciones extremas (fuertes). **Resultados:** En los Estudios 1 ($N = 392$) y 2 ($N = 808$) entre personas con intenciones fuertes, las normas y el comportamiento pasado fueron predictores consistentes de participar en actividad física evaluada objetivamente y en exámenes intestinales, respectivamente. En los Estudios 3 ($N = 4{,}148$) y 4 ($N = 445$) entre personas con intenciones fuertes, las actitudes afectivas (solo el estudio 3), las normas descriptivas, la capacidad/autonomía y el comportamiento pasado fueron predictores de resistirse a iniciar el tabaquismo y adoptar conductas de protección contra el COVID-19, respectivamente. El Estudio 4 también mostró que el hábito es un predictor significativo de la acción en personas con intenciones fuertes. **Conclusión:** Esta investigación identifica factores que podrían ser objetivos útiles para promover el compromiso con conductas de salud en aquellos que ya tienen fuertes intenciones de actuar. Investigaciones futuras podrían probar de manera útil si centrarse en estas mismas variables se traduce en un cambio de comportamiento en aquellos que ya tienen fuertes intenciones de actuar.

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