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Sheeran, P and Conner, M orcid.org/0000-0002-6229-8143 (2017) Improving the Translation of Intentions Into Health Actions: The Role of Motivational Coherence. Health Psychology, 36 (11). pp. 1065-1073. ISSN 0278-6133

https://doi.org/10.1037/hea0000553

Improving the Translation of Intentions into Health Actions: The Role of Motivational Coherence

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Abstract

Objective: This paper introduces a new construct termed motivational coherence, and tests its influence upon the process of translating intentions into health actions. Motivational coherence was defined as the extent to which predictors of intentions (e.g., attitudes, norms, perceived control) cohere or point in the same direction. The prediction tested was that motivational coherence would stabilize intentions and thereby increase intention-behavior consistency. Methods: Three studies were conducted that each involved prospective designs. Study 1 (N = 248) concerned breast-feeding among nulliparous, low-income women. Study 2 (N = 651) concerned physical activity, and Study 3 (N = 635) examined uptake of smoking among adolescents. Results: Motivational coherence moderated intention-behavior relations in all three studies. Greater motivational coherence was associated with a stronger relationship between intentions and action. This finding also held when other predictors of intention (Studies 1-3) and past behavior (Studies 2-3) were taken into account. Study 3 tested and found support for the idea that temporal stability of intention mediated the moderating effect of motivational coherence. Conclusions: The present studies suggest that future research on predicting health behaviors should consider not only the strength of people's intentions to act, but also whether the basis of respective intentions is motivationally coherent.

Keywords: Intention-behavior gap, smoking, physical activity, breastfeeding

Improving the Translation of Intentions into Health Actions: The Role of Motivational Coherence

Behavioral intentions are people's self-instructions to act in a particular manner (e.g., "I will try not to smoke," "I intend to exercise at least twice each week") and are construed as a key predictor of behavioral performance in prominent theories of health behavior (e.g., Ajzen's, 1991, theory of planned behavior; Bandura's, 1991, social cognitive theory; Roger's, 1983, protection motivation theory). During the past two decades, however, it has become apparent that people often fail to translate their intentions into action (e.g., Godin & Conner, 2008; Orbell & Sheeran, 1998; Sheeran, 2002; Rhodes & de Bruijn, 2013). This phenomenon is termed the intention-behavior gap (Sheeran, 2002), and has led to a good deal of research on factors that moderate the consistency between intentions and health actions (see, e.g., Rhodes & Dickau, 2013; Sheeran & Webb, 2016, for reviews). In the present paper, we introduce a new construct, motivational coherence, that predicts how effectively intentions are translated into action. Below, we review previous research on the intention-behavior gap before defining motivational coherence in both conceptual and operational terms. Three empirical studies are presented that test whether and why motivational coherence moderates the intention-behavior relation.

Previous Research on the Intention-Behavior Gap

Findings from prospective surveys (see, e.g., McEachan et al., 2011, for a review), statistical simulations (Fife-Schaw, Sheeran, & Norman, 2011), and interventions that changed intentions (see, e.g., Rhodes & Dickau, 2012; Webb & Sheeran, 2006, for reviews) all converge on the conclusion that the gap between intentions and health behavior is substantial. Reviews typically report that only one-half of intended health actions are realized (Godin & Conner, 2008; Sheeran, 2002; Rhodes & de Bruijn, 2013). Research on factors that make it more or less likely that intentions will be enacted has predominantly focused on two types of factor –

intention strength and the basis of intention (Sheeran & Webb, 2016). Intention strength refers to properties beyond the intention's direction (intend vs. do not intend) and intensity (how much one intends to act) that influence rates of intention realization. The most extensively studied property of intention strength is temporal stability (e.g., the within-participants correlation between intention items taken at two time-points prior to the measurement of behavior) and accumulated evidence indicates that intention stability is a powerful moderator of the intention-behavior relation (Conner & Godin, 2007; Conner, Norman, & Bell, 2002; Cooke & Sheeran, 2013; Sheeran & Abraham, 2003; see Cooke & Sheeran, 2004, for a meta-analysis).

Several factors that guide intention formation (i.e., form the basis of the intention) also influence how effectively those intentions are realized. For instance, findings indicate that intentions based on attitudes better predict behavior than intentions based on norms (Sheeran & Orbell, 1999) and that greater feelings of moral obligation, greater anticipated regret about failing to act, and having a self-schema in the behavioral domain are each associated with improved consistency between intentions and behavior (Abraham & Sheeran, 2003; Conner, Sandberg, McMillan, & Higgins, 2006; Conner, McEachan, Lawton, & Gardner, 2016; Godin, Conner, & Sheeran, 2005; Sheeran & Abraham, 2003; Sheeran & Orbell, 2000). Interestingly, factors that form the basis of intention appear to strengthen intention-behavior relations precisely because these factors increase the temporal stability of intentions. Sheeran and Abraham (2003) observed that temporal stability mediated the moderating effects of attitudinal versus normative control, moral norms, anticipated regret, and self-schemas on intention-behavior consistency.

Motivational Coherence

The present research introduces and tests motivational coherence as a new moderator of intention-behavior relations. Motivational coherence can be defined as the degree to which the

factors that determine a person's intention all favor the same course of action, that is, how coherent is the basis of the intention. When the various factors that determine intention (attitudes, norms, perceived behavioral control, etc.) all support performance of the behavior, this should lead to more coherent intentions that better predict behavior compared to intentions where some factors favor performance (e.g., positive attitudes and perceived behavioral control) but other factors favor non-performance (e.g., negative social norms). The argument is that when attitudes, norms, and perceived behavioral control all point in the same direction, people are less likely to have 'second thoughts' about how to act compared to situations wherein they experience conflict among the different considerations guiding intention formation. Thus, greater motivational coherence (stronger agreement about the course of action among the factors informing the intention to act) should stabilize intentions, and so lead to improved translation of respective intentions into action.

Motivational coherence can be operationalized as the within-participant standard deviation of the factors presumed to influence intention (attitudes, norms, perceived behavioral control, etc.) multiplied by -1. For instance, if attitude, norms, and perceived behavioral control (PBC) were measured by single items and had scores of 7, 7, and 2, respectively, on 7-point response scales, then the motivational coherence score would be -2.89. If the respective scores were 7, 7, and 6, on the other hand, then the score would be -0.58 (the Supplementary Materials include an Excel macro for computing motivational coherence scores for different values of attitudes, norms, and PBC). Thus, this index captures how much variability (vs. agreement) there is among the attitudinal, normative, and control inputs to the process of intention formation.

Motivational coherence can be distinguished from seemingly related constructs such as ambivalence (see, e.g., Conner & Sparks, 2000, for a review), decisional conflict (e.g.,

O'Connor, 1995), and goal conflict (e.g., Conner et al., 2016). Ambivalence refers to holding both positive and negative beliefs about the consequences of a behavior and is a feature of attitudes only, whereas motivational conflict also embraces other considerations such as norms and perceived control that are not part of ambivalence. Decisional conflict refers to uncertainty about what course of action to undertake. Motivational coherence, on the other hand, does not assume that people are uncertain about what to do, and does not measure meta-judgments about the state of people's intention; rather, motivational coherence is an operative measure that is inferred from responses and not from self-reports of how coherent are one's intentions (see Bassili, 1995). Finally, goal conflict refers to how much people believe that the pursuit of other goals will facilitate or hinder the focal goal. Motivational coherence, however, concerns the focal goal only, and how much the factors that determine the focal goal intention cohere with one another. In sum, there are both conceptual and measurement grounds for thinking that motivational coherence is a distinct construct that could help explain the intention-behavior gap.

The Present Research

To offer a comprehensive test of motivational coherence as a moderator of intention-behavior relations, we undertook three studies. Study 1 (N = 247) concerned breast-feeding among nulliparous, low-income women. Study 2 (N = 651) concerned a familiar and frequently performed behavior (physical activity) that was measured objectively via sports center attendance. In Study 2, we also measured past behavior, and covaried this variable in the analyses to assess moderation of the relationship between intention and behavior change. Study 3 (N = 463) concerned uptake of smoking among adolescents over a 21-month period. We again covaried past behavior in the analyses, and also tested whether intention stability mediated the moderating effect of motivational coherence on intention-behavior relations.

Study 1: Breastfeeding Among Low-Income Women

Method

Participants and Procedure

Participants were pregnant women, with no previous live births, living in areas of economic hardship. Midwives identified and approached 449 eligible participants[1] and 411 agreed to take part (91.5%). Approximately 4 months later, breastfeeding was recorded. Complete data could be obtained for 248 women (60.3% of those originally agreeing to participate). Aspects of these data were previously reported by McMillan et al. (2008, 2009). The National Health Service multi-center research ethics committee and local research ethics committees for each hospital in each site approved the study protocol.

Measures

All measures except behavior were assessed by means of a confidential questionnaire. Participants were asked for their name and contact details to enable matching of questionnaires. Breastfeeding was defined as feeding a baby any breast milk, including feeding expressed breast milk from a bottle.

Intention to breastfeed was measured using 4 items (e.g., "Do you intend to breastfeed your baby?" 5-point scale, 'Definitely do not - definitely do'). The remaining items asked participants how much they wanted to breastfeed, how committed they were to breastfeeding, and how determined they were to breastfeed (Cronbach's α = .96).

Motivational coherence was measured by the within-person standard deviation of predictors of intentions to breastfeed multiplied by -1 (so that higher scores indicated greater motivational coherence). A total of 27 items were used to compute this measure and tapped attitude towards breastfeeding (7-item semantic differential measure, e.g., "For me to breastfeed my baby would

be…unpleasant-pleasant, embarrassing–not embarrassing, unhealthy–healthy, repulsive–attractive, inconvenient–convenient, unnatural–natural, bad–good"), outcome beliefs about breastfeeding (5 likelihood judgments for outcomes of breastfeeding, e.g., "If I breastfeed it will be good for my figure, unlikely-likely"), normative beliefs regarding breastfeeding (6 likelihood judgments regarding salient referents' views of breastfeeding, e.g., "My mother thinks that I, definitely should not breastfeed to definitely should breastfeed"), perceived behavioral control over breastfeeding (3 items tapping confidence in breastfeeding, "For me breastfeeding my baby would be. . ., difficult –easy"), breastfeeding self-identity (3 items tapping identification with breastfeeding, "Breastfeeding would be an important part of who I am, strongly disagree – strongly agree"), and affect towards breastfeeding (3 items tapping feelings about breastfeeding, e.g., "It would feel right for me to breastfeed my baby, strongly disagree-strongly agree"). All items involved 5-point response scales (equivalent scale points or conversion to z-scores is essential for computing motivational coherence). We computed split-half reliability using the Spearman-Brown formula and observed a coefficient of 0.81 ($p < .001$).

Behavior was indexed by patient records. Medical staff indicated whether or not participants had breastfed while they were still in hospital after the birth (coded 1 and 0, respectively).

Results and Discussion

Table 1 (left-hand panel) reports the M and SD for each of the study measures and their intercorrelations. Motivational coherence had a small, significant, positive correlation with intentions but was not significantly related to behavior.

Intentions and motivational coherence were entered on the first step of a logistic regression, and the interaction term entered on the second step. Variables were mean-centered to aid interpretation. At step 1, only intentions were significant and the variables explained 45.3%

of the variability in breastfeeding (Table 2, left-hand panel). At step 2, intention ($p < .001$) and the interaction term ($p < .05$) were the only significant predictors of breastfeeding explaining 46.9% of the variability in breastfeeding (Table 2, left-hand panel). We used simple slopes analyses to explore the nature of the interaction. Figure 1 indicates that intentions better predicted behavior when there was high (M + 1SD; $B = 1.59$, $p < .001$) motivational coherence as compared to low (M - 1SD: $B = 0.96$, $p < .001$) motivational coherence. Findings remained substantively unchanged when the other predictors (attitudes, norms, perceived behavioral control, identity, affect) were controlled. In sum, Study 1 offers initial evidence that motivational coherence moderates the intention-behavior relation, as predicted.

Study 2: Physical Activity Among Young People

Whereas Study 1 concerned a behavior that was novel to participants, Study 2 examined physical activity – a behavior that was familiar to and could be frequently performed by participants. To gain an objective index of physical activity, we assessed how often participants attended a university sports center. Aspects of these data were previously reported by Sandberg and Conner (2011). The University of Leeds IRB approved the study protocol.

Method

Participants

Participants were recruited via various departments from a university in the north of England. Departments were asked to send an email to their students that contained a hyperlink to the questionnaire web site. Participants were informed that the questionnaire related to research being carried out by the University together with the Sports Center – to find out members' views about exercising at the University Sports Center. As such, only members of the sports center

were eligible to participate. In total, 25 departments agreed to forward the email to their students.

Analysis of the number of "hits" the web pages received indicated that the introductory page was viewed 1099 times. The questionnaire was accessed by pressing a submit button at the end of the introductory page, and was accessed 777 times. A total of 651 participants submitted the completed questionnaire (M-age = 20 years, SD = 2.80; 61% female).

Objective measures of behavior (i.e., the number of times participants' student card was used to gain entry to the Sports Centre during a specified two-week period) were obtained for all 651 participants using student card data recorded from the sports center turnstiles. Participants were assured that their confidential card data would be used for no other purpose.

Questionnaire and Procedure

The data from the present study come from a larger research project. Only questionnaire items relevant to the present study are reported here. The questionnaire specified the target of performing regular exercise "at least twice per week over the next two months." It was stressed that the questionnaire only related to exercise performed in the University Sports Centre.

Unless otherwise stated, items employed 7-point response options. Intentions were assessed with two items ("I intend to exercise at least twice per week over the next 2 months at the Sports Centre, strongly disagree-strongly agree"; "How strong is your intention to exercise over the next 2 months at the Sports Centre?, not at all strong-very strong") ($r = .49$, $p < .001$).

Motivational coherence was again measured by the within-person standard deviation of predictors of intentions to breastfeed multiplied by -1 (higher scores indicate greater motivational coherence). A total of 15 items were used to compute this measure and tapped attitudes (7 item semantic differential measure, "For me, exercising at least twice per week over the next 2

months at the Sports Centre would be … unpleasant-pleasant, not enjoyable-enjoyable, unsatisfying-satisfying, harmful-beneficial, negative-positive, not worthwhile-worthwhile, good-bad"), norms (3 items, e.g., "Most people who are important to me think that I should exercise at least twice per week over the next 2 months at the Sports Centre, strongly disagree-strongly agree") and perceived behavioral control (5 items, e.g., "If I wanted to, I could easily exercise twice per week over the next 2 months at the Sports Centre, strongly disagree-strongly agree"). We computed split-half reliability using the Spearman-Brown formula ($r = .50$, $p < .001$).

Past Behavior was assessed by three items ("In the past, I have exercised at least twice per week at the Sports Centre, never-frequently"; "How many days did you exercise at the Sports Centre last week?"; "In the past few weeks, I have exercised at least twice per week at the Sports Centre, never-frequently"). Scores were standardized and proved reliable (alpha = .83).

Behavior was measured by number of times participants entered the sports centre during the two target weeks. This target period was determined by staff at the Sports Centre; this was the interval during which they could assist with the study.

Results and Discussion

Table 1 (middle panel) reports the mean and SD on each of the measures and the intercorrelations among measures. Past behavior, intention, and motivational coherence were each significantly and positively correlated with behavior.

Predictors were mean-centered and entered in a 2-step hierarchical multiple regression. Table 2 (middle panel) indicates that intention, past behavior, and motivational coherence each had significant positive beta coefficients at step 1, and explained 12.4% of the variance in behavior. At step 2, the interaction between intentions and motivational coherence explained an additional 1.0% of the variance in exercise behavior. Intention, past behavior, motivational

coherence, and the interaction term were significant predictors. Including attitude, subjective norm, and perceived behavioral control at step 3 did not alter the significance level of the interaction term. To guard against the possibility of zero inflation, we also ran a Poisson regression; the intention × motivation coherence interaction term also proved significant in this analysis (B = .295, SE = .099, p = .003).

Simple slopes analyses indicated that intentions were stronger predictors of behavior at high levels of motivational coherence (B = 0.35, p < .001) as compared to low levels of motivational coherence (B = 0.06, p = .32; see Figure 2). These findings corroborate the results of Study 1 – that motivational coherence is associated with improved translation of intentions into action.

Study 3: Smoking Initiation Among Adolescents

One could argue that Studies 1 and 2 did not offer a stern test of whether motivational coherence moderates intention-behavior relations as the follow-up periods were relatively short (< 3 months) and involved only adult samples. To address these potential concerns, we undertook a third study that assessed rates of uptake of smoking among adolescents (11-12 years) over a 21-month period. It is also the case that Studies 1-2 did not test intention stability as the proposed mechanism underlying the moderating effects of motivational coherence. We therefore undertook a formal test of mediated moderation (Hayes, 2013) in Study 3. In particular, we anticipated that (a) intentional stability and motivational coherence would both (independently) moderate the consistency between intentions and behavior, (b) motivational coherence would be associated with greater intention stability, and (c) in simultaneous test, the intention × intention stability interaction term would mediate the interaction between motivational coherence and intention in predicting behavior.

Method

Participants and Procedure

Pupils were recruited from twenty schools with mixed ability classes from a single Local Education Authority in northern England (see Conner et al., 2009, for study details). Participants completed questionnaires in relation to smoking on a number of occasions and previously unreported data from the second (3 months post-baseline), fifth (15 months post-baseline), sixth (18 months post-baseline) and seventh (24 months post-baseline) rounds of data collection are reported here. The sample of adolescents was either 11 (89%) or 12 (11%) years of age at baseline. Questionnaires were completed in classroom time. After eliminating participants with missing data on any variable, a total of 635 adolescents were included in the analyses (324 females, 311 males). The University of Leeds IRB approved the study protocol.

Measures

At first follow-up (3 months post-baseline), intentions to smoke and self-reported smoking (past behavior) were assessed. At the second follow-up (12 months later) intentions to smoke were assessed again. At the third follow-up (3 months later) intentions to smoke were assessed along with theory of planned behavior variables and other predictors of smoking. At the final follow-up (6 months later), smoking behavior was assessed using an objective measure. Only measures relevant to the present study are reported below.

Intention to smoke was assessed by the same 3 items at each of the first three time points ("I plan not to smoke this term"; "I do not want to smoke this term"; "I will try not to smoke this term;" 5-point, 'strongly agree-strongly disagree'; scored such that high scores indicated positive intentions to smoke) (alphas = .81, .85 and .90, respectively). Attitude was assessed by 5 semantic differential scales ("Smoking for me this term would be ... bad-good, harmful-

beneficial, unpleasant-pleasant, unenjoyable-enjoyable, foolish-wise"; 5-point scales scored such that high scores indicated positive views of smoking; alpha = .89). Subjective norm was indexed by 5 items ("My friends think… I should not smoke-I should smoke"; 'My best friend thinks… I should not smoke-I should smoke"; "People who are important to me think… I should not smoke-I should smoke"; "People who are important to me want me to smoke. Is this… unlikely-likely"; 'I feel like people my age are trying to get me to smoke, strongly disagree-strongly agree"; "My family think… I should not smoke-I should smoke"; all scored 1 to 5 such that high scores indicated positive views of smoking; alpha = .90). Perceived behavioral control was assessed by 9 items with 5-point response scales (e.g., "I am confident I could resist smoking this term, strongly disagree-strongly agree"; "For me to not smoke this term would be … difficult-easy"; "How much control do you feel that you have over not smoking this term?, no control-complete control"; all scored 1 to 5 such that high scores indicated positive views of smoking; alpha = .92).

Motivational coherence was calculated using the within-person standard deviation of the 19 theory of planned behavior items multiplied by -1. We again computed the split-half reliability using the Spearman-Brown formula ($r = .80$, $p < .001$).

Intention stability was computed using the measures of intentions taken at the first two time-points. We used a standard index of stability – the absolute difference between answers to repeated questions (Batista-Foguet & Saris, 1997; Campbell, 1990) – and multiplied scores by -1 so that higher scores indicate greater intention stability.

Past behavior was based on self-report measures adapted from Jarvis (1997) taken at baseline: "Cross one of the following: I have not smoked at all last term; I have only ever tried smoking once last term; I used to smoke sometimes last term, but I never smoke cigarettes now; I

sometimes smoked cigarettes last term, but not as many as one a week; I usually smoked between one and six cigarettes a week last term; I usually smoked more than six cigarettes a week last term" (scored 0 for the first three responses and 1 for the other responses).

Smoking behavior at 24 months was measured objectively using a battery operated, portable carbon monoxide monitor (EC-50-Micro Smokerlyzer®, Bedfont Scientific, Limited, Kent, England). This device gives a measure of carbon monoxide in the breath in parts per million (ppm); based on exhaling one breath into the device, it is accurate to within 2%. Although a number of factors influence carbon monoxide in the breath, smoking should significantly elevate levels (to a level in excess of 10ppm). Carbon monoxide (CO) has a half-life of 4 to 6 hours and is a major constituent of cigarette smoke; CO can be used as a reliable and valid measure of exposure to cigarette smoking (Stookey et al., 1987) and is comparable in accuracy to blood carboxyhaemoglobin levels (Jarvis et al., 1987). The Bedfont EC-50 device has been demonstrated to give reliable and valid assessments of smoking status (Irving, Clark, Crombie, & Smith, 1988) and has been validated with adolescent samples (Zack et al., 2001).

Results and Discussion

Table 1 (last panel) reports the mean and SD on each of the measures and their intercorrelations. Intentions, motivational coherence, and past behavior were significantly correlated with behavior. Linear regression was used to predict smokerlyzer scores. Intention, motivational coherence, and past behavior entered on the first step, followed by the motivational coherence by intention interaction term on the second step. On the final step, intention stability and the intention stability by intention interaction were entered. Table 2 (right-hand panel) indicates that intention, motivational coherence and past behavior were significant predictors of behavior at step 1, and explained 9.7% of the variance. The interaction between intentions and

motivational coherence ($p < .01$) significantly predicted smoking initiation at step 2, and explained an increment of 1.1% of the variance. Simple slopes analyses (see Figure 3, top panel) indicated that intentions better predicted (not) smoking at high levels of motivational coherence ($B = 0.47$, $p < .001$) than low levels of motivational coherence ($B = 0.00$, $p = .70$). The intention × motivational coherence interaction remained significant when clustering by schools was taken into account in a multilevel model, and when the data were analysed via Poisson regression.

Entering intention stability and the interaction between intentions and intention stability at step 3 explained an additional 4.6% of the variance in smoking behavior. Motivational coherence ($p < .05$), past behavior ($p < .05$), intention stability ($p < .05$) and the intentions x intention stability interaction term ($p < .001$) were significant at this step, whereas the interaction between intentions and motivational coherence became non-significant. Including attitude, subjective norm, and perceived behavioral control in the regression equation at step 3 did not change the significance of the interaction terms. Simple slopes analyses (see Figure 3, bottom planel) showed that stable intentions were associated with improved prediction of behavior (M + 1SD; $B = 0.42$, $p < .001$) compared to unstable intentions (M - 1SD; $B = -0.11$, $p = .36$). [1]

The observation that the intention × intention stability interaction term reduced the intention × motivational coherence interaction term to non-significance in a simultaneous test is consistent with the idea that intention stability mediates the moderating effect of motivational coherence on the intention-behavior relationship. Bivariate analysis confirmed that greater motivational coherence was associated with increased temporal stability of intention ($r = .310$, p

[1] To double-check these findings, we reran the analyses using mean substitution for all missing values of independent variables in the analyses. (We followed Cattle et al.'s, 2011, recommendation and did not impute missing data for behavior at follow-up.) Among this larger sample ($N = 967$), the intention × motivational coherence interaction significantly predicted behavior ($\beta = .12$, $p = .006$). However, when the intention × intention stability interaction term was added to the equation, the intention × motivational coherence interaction became non-significant (($\beta = .06$, $p = .052$) whereas the intention × intention stability interaction predicted behavior ($\beta = .10$, $p = .006$). These findings corroborate the results obtained using casewise deletion of missing values.

< .001). We undertook a formal test of mediated moderation using the PROCESS macro (Hayes, 2013). Findings confirmed a significant mediating effect of intention × intention stability interaction (B = .177, SE = .046, z = 3.84, p < .001). Bootstrap estimates of the mediated effect based on 20,000 resamples indicated the 95% confidence interval did not contain zero (0.025 to 0.531). The significant direct effect observed for the intention × motivational coherence interaction term (B = .327, SE = .116, p < .001) was no longer significant when intention stability and the intention x intention stability interaction were taken into account (B = .128, SE = .120, p > .25). Thus, the intention × intention stability interaction completely mediated the influence of motivational coherence on intention-behavior consistency (Hayes, 2013).

General Discussion

The present research tested and found support for motivational coherence as a new moderator of the relationship between intentions and health behaviors. Although intentions are construed as the most immediate and important predictor of behavior in several health behavior theories (e.g., Ajzen, 1991; Bandura, 1991; Rogers, 1983), evidence indicates that even strong intentions often are not translated into health actions (Sheeran & Webb, 2016). Thus, it has become vital for researchers and practitioners to understand when intentions are more or less likely to be realized successfully. The studies reported here contribute to this effort by demonstrating that it matters how much attitudinal, normative, and control considerations cohere or point in the same direction. Intentions that exhibited greater motivational coherence were more effectively translated into action than were their less coherent counterparts. This key finding was observed in three studies with objectively measured outcomes, and in relation to a range of different behaviors (breastfeeding, physical activity, smoking initiation) and samples (low-income women, educated young people, school-going adolescents).

Why did motivationally coherent intentions lead to improved prediction of behavior by intention? In Study 3, we computed a measure of intention stability from measures of intention taken 12 months apart that was separate from our measure of intentions used to predict behavior. Consistent with previous research, we observed that temporal stability of intentions not only moderated the intention-behavior relation (e.g., Conner, Sheeran, Norman, & Armitage, 2000; Cooke & Sheeran, 2013) but also mediated the effect of another moderator (motivational coherence) of intention-behavior relations (Sheeran & Abraham, 2003). These findings indicate that motivational coherence strengthens intention-behavior consistency because motivationally coherent intentions are more stable over time. It seems that when attitudes, norms, and perceived behavioral control all favor the same course of action, then people are less likely to change their mind about how they will act. Intention stability is thus the mechanism through which motivational coherence improves the process of translating intentions into health behaviors.

The studies reported here offer the first tests of the moderating role of motivational coherence and, inevitably, possess limitations that should be acknowledged. First, only three behaviors and three samples were examined here, and tests in relation to other health actions and other participant groups are needed to determine generalizability. Second, there was a lack of correspondence between the measure of intention (that specified “over the next 2 months”) and the measure of behavior (that involved a 2-week observation period) in Study 2. This was caused by difficulties in garnering the co-operation of the relevant sports center staff to obtain follow-up data over a longer period. Although this consideration may have reduced the correlation between intention and behavior (Ajzen, 1991), it seems implausible that it influenced the moderating role of motivational coherence. Finally, we acknowledge that the present studies each involved

correlational designs, and experimental tests that manipulate motivational coherence and assess effects on intention-behavior relations would be desirable.

Notwithstanding these limitations, the present research affords new insights into intention-behavior consistency and offers several potentially fruitful directions for future research. Whereas previous tests of moderators of the intention-behavior relation focused on individual variables (e.g., moral norms, self-schemas, anticipated regret) or the relative influence of particular variables (e.g., attitudes vs. norms, affective vs. instrumental attitudes), the findings obtained here point to the importance of considering relations among the suite of predictors that influence intention formation. Disagreement among these predictors (indexed by motivational coherence) has important implications for how successfully the respective intentions are enacted. In the present studies, we focused on the attitudinal, normative, and control factors specified by the theory of planned behavior (TPB) to index motivational coherence. However, several factors not specified by the TPB also influence intentions (e.g., descriptive norms, self-schemas, moral norms, self-identity; see Conner & Armitage, 1998, for a review). An important question that could be addressed in future research is whether measures of motivational coherence that take account of this larger set of predictors offer superior moderation of intention-behavior relations compared to the indices used here. Future research could also attempt to distinguish different types of motivational incoherence. For instance, is it more disruptive to intention-behavior consistency when perceived behavioural control points in a different direction to attitudes and social norms than when attitudes and perceived behavioral control point in one direction, and social norms point in another? And do the consequences of different types of motivational incoherence vary for different samples or different behaviors?

The present findings also have implications for the clinical implementation of prevention and intervention approaches. Whereas previous research has focused on the best ways to strengthen health-related behavioral intentions (e.g., Webb & Sheeran, 2006), the results obtained here suggest that it is not sufficient to focus solely on maximizing intentions to perform health behaviors. Research participants could hold very strong intentions based on favorable attitudes and norms and, at the same time, exhibit low perceived behavioral control. Or strong intentions to act could derive from a favorable self-identity and high perceived behavioral control while participants simultaneously hold weak attitudes and norms. The key insight afforded by the present research is that intervention is still needed – promote motivational coherence – even when intention scores are maximized. Thus, interventionists and practitioners should evaluate the motivational impact of their interventions not only on the basis of intention strength but also based on whether attitudes, norms, perceived behavioral control, and other considerations all favor performance of the focal health behavior. The findings observed here make it clear that even strong intentions will not be realized effectively unless respective intentions are also motivationally coherent.

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Table 1

Descriptives and Correlations for Variables in Studies 1-3.

	Study 1					Study 2					Study 3				
	Correlations			Descriptives		Correlations			Descriptives		Correlations			Descriptives	
	BI	MoC	PB	M	SD	BI	MoC	PB	M	SD	BI	MoC	PB	M	SD
Behavior	.612***	.092	-	0.657[a]	0.476	.143***	.242***	.256***	1.310	1.711	.242***	.216***	.207***	1.187	1.852
Intention (BI)	-	.249***	-	3.847	1.360	-	.151***	-.140***	4.066	1.290		.355***	.179***	1.352	0.896
Motivational coherence (MoC)		-	-	-1.287	0.364		-	.211***	-1.513	0.308			.270***	-1.084	0.608
Past Behavior (PB)	-	-	-	-	-			-	3.139	1.196				0.124	0.330

Note. [a] indicates that 65.7% of participants engaged in breastfeeding. Study 1, N = 248; Study 2, N = 651; Study 3, N = 635.

* p < .05, ** p < .01, *** p < .001.

Table 2

Regressions of Behavior on Predictors in Studies 1-3

		Study 1				Study 2			Study 3		
Step	Predictors	B	SE	OR	[95%CI]	B	SE	β	B	SE	β
1	Intention	1.189	.152	3.283***	[2.435,4.426]	0.200	.050	.151***	0.362	.084	.175***
	Motivational coherence	-0.451	.487	0.637	[0.245,1.656]	0.937	.213	.169***	0.350	.126	.115**
	Past behavior					0.345	.055	.241***	0.810	.221	.145***
2	Intention (BI)	1.275	.164	3.579***	[2.597,4.933]	0.250	.053	.189***	0.186	.104	.090
	Motivational coherence	-0.491	.478	0.612	[0.240,1.561]	0.875	.213	.157***	0.347	.126	.114**
	Past behavior			-		0.336	.055	.235***	0.793	.220	.141***
	BI x Motivational coherence	0.869	.441	2.384*	[1.006,5.654]	0.413	.154	.106**	0.327	.116	.136**
3	Intention (BI)	-				-			0.033	.105	.016
	Motivational coherence	-				-			0.291	.124	.096*
	Past Behavior	-				-			0.496	.224	.089*
	BI x Motivational coherence	-				-			0.128	.120	.053
	Intention stability	-				-			0.222	.095	.103*
	BI x Intention stability	-				-			0.278	.064	.208***

Note. Study 1, N = 248: Step 1 model fit, Δchi-squared (2) = 99.0, $p < .001$, -2 Log likelihood = 219.8, Nagelkerke $R^2 = .453$; Step 2 model fit, Δchi-squared (1) = 3.84, $p < .05$, -2 Log likelihood = 216.0, Nagelkerke $R^2 = .469$. Study 2, N = 651: Step 1 model fit, $F(3,647) = 30.5$, $p < .001$, $R^2 = .124$; Step 2 model fit, $\Delta F(1,646) = 7.2$, $p < .01$, $\Delta R^2 = .010$. Study 3, N = 635: Step 1 model fit, $F(3,631) = 22.6$, $p < .001$, $R^2 = .097$; Step 2 model fit, $\Delta F(1,630) = 7.90$, $p < .01$, $\Delta R^2 = .011$; Step 3 model fit, $\Delta F(2,628) = 17.1$, $p < .001$, $\Delta R^2 = .046$.

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

Figure 1

Simple Slopes (Logistic Curves) Predicting Breastfeeding from Intentions by Motivational Coherence (Study 1)

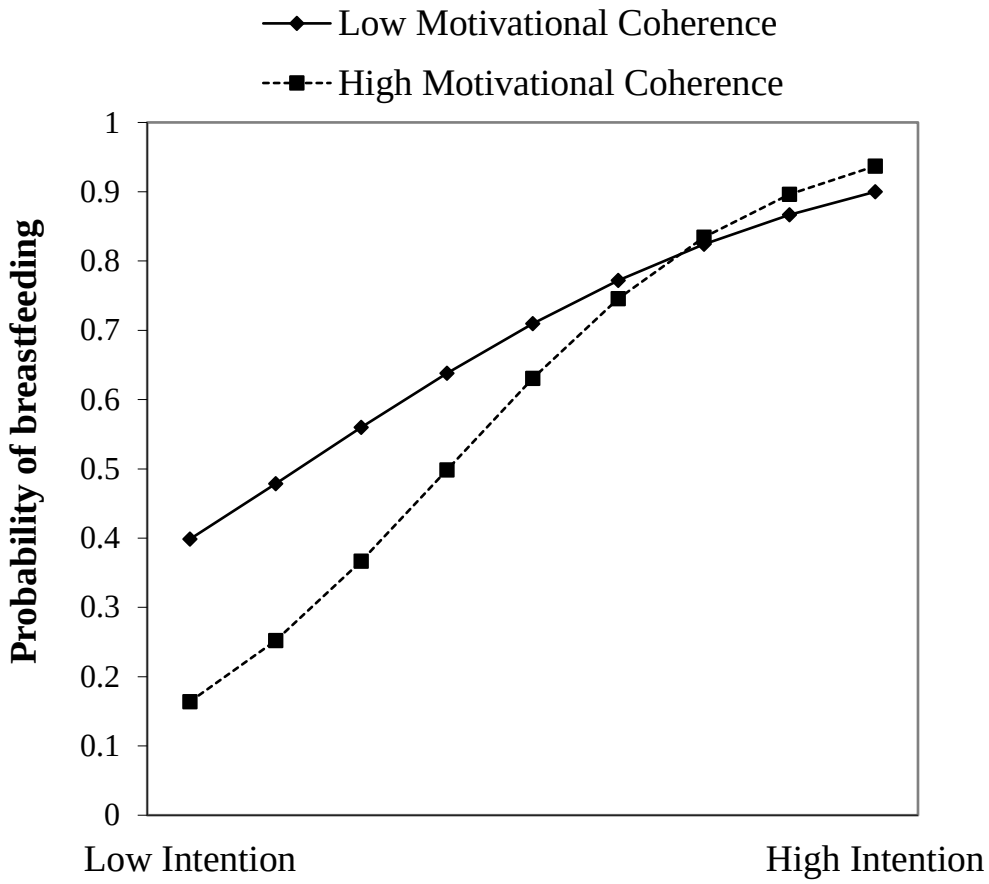

Figure 2

Simple Slopes Predicting Sports Center Attendance from Intentions by Motivational Coherence (Study 2)

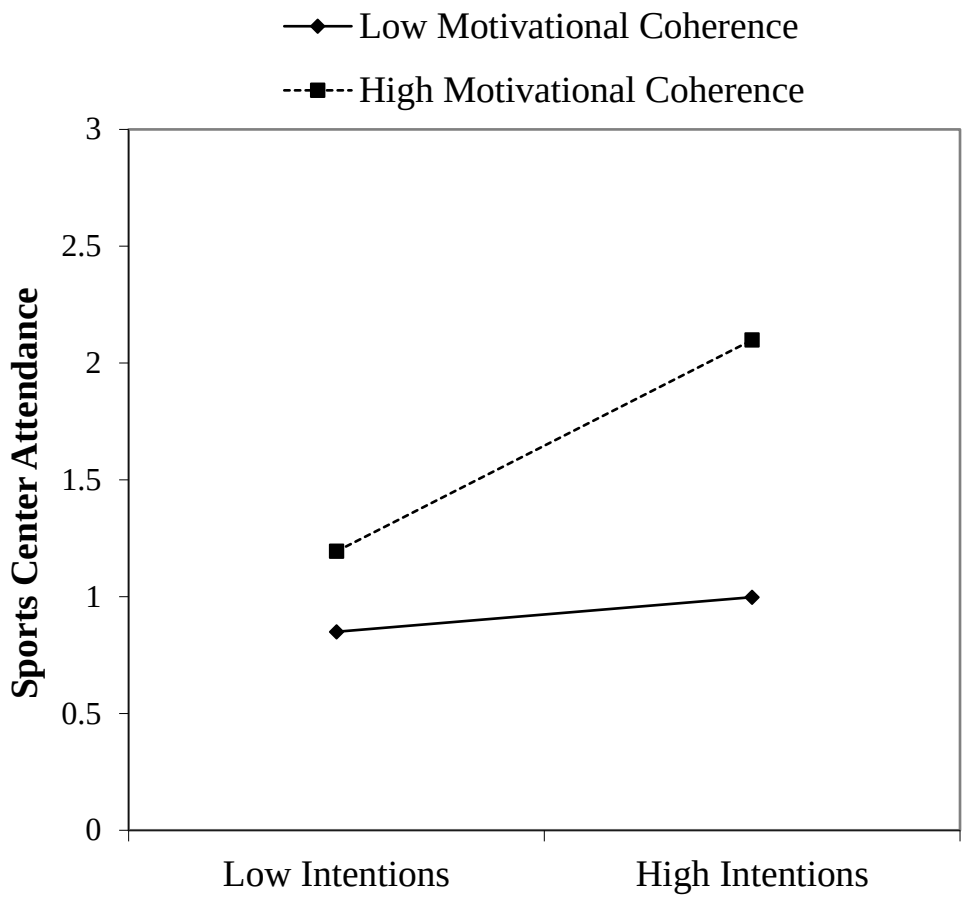

Figure 3

Simple Slopes Predicting Smoking Initiation from Intentions by Motivational Coherence (Top Panel) and Intention Stability (Bottom Panel)