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Putting Attitudes in Their Place:

Behavioural Prediction in the Face of Competing Variables

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*The greatest discovery of our generation is that
human beings can alter their lives by altering their attitudes of mind.*

As you think, so shall you be.

—William James

The choices of our lives often appear to hinge on our preferences. What foods we eat, where we choose to work or go to school, who we marry—to the average person, much of our behaviour seems to be driven by our likes and dislikes. Attitude is the term that psychologists use to denote these differing preferences for objects, ideas, behaviours, and people. More formally stated “an attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly & Chaiken, 1993, p. 1). Over the more than 80 years of attitude research history, opinions have varied about the degree of influence that attitudes have on our behaviour. Many early social psychologists were compelled by the notion that an individual attitude could significantly impact behaviour. Perhaps most prominent among them, Gordon W. Allport (1935) asserted that attitudes exert a direct and dynamic impact upon behaviour, whereas his contemporary Richard LaPiere (1934) contended that attitudinal reports may only minimally predict behaviour.

Even today the attitude-behaviour debate continues, although discourse has often centred more on the precise aetiology and role of attitudes. Prominent theorists have contended attitudes really do underlie and cause behaviours (e.g., Ajzen & Fishbein, 2005), whereas others have demonstrated that behaviour often impacts attitudes (Festinger & Carlsmith, 1959; Zimbardo, 1971), especially when attitudes are weak (Bem, 1972; Wells &

Petty, 1980). More recently, some researchers have argued that attitudes are generated on-the-spot to guide and sometimes rationalize actions (e.g., Schwartz, 2000), that attitudes are either open to awareness or are subconscious (e.g., Greenwald & Banaji, 1995), and that attitudes can even impact what beliefs people hold (Marsh & Wallace, 2005). In summary, researchers continue to strive to further define the nature and role of attitudes in everyday life.

In this chapter, we provide a brief history of the main streams of theory and research that have addressed attitude-behaviour relations. We discuss variables, both conceptual and methodological, previously shown to impact the attitude behaviour relation. Additionally, we point out that past research on attitude-behaviour relations has largely focused on the nature of the attitude under question and of variables allied to attitude, but largely ignored the nature of the behaviour being predicted. Studies on attitude-behaviour relations have operationalized behaviour in a myriad of ways, often with little thought to mundane realism or external validity. Although the behaviours being studied might often be convenient choices and offer face validity, they leave the impression that attitudes scholars believe that attitudes are complex and variable but that behaviours are simple and static. We conclude that behaviours are often just as complex as attitudes—if not more so—and that when studying the attitude-behaviour relation much can be learned by focusing on the criterion instead of solely on the predictor.

A Brief History of Attitude-Behaviour Research

Waxing and waning of the attitude construct. Although our opening paragraphs may have implied that the field is unified behind the sort of definition that Eagly and Chaiken have provided, in fact there have been considerable differences across the history of the attitude research (cf. Eagly & Chaiken, 2007; Johnson, Maio, & Smith-McLallen, 2005). Some of these

definitional variations have resulted in varied operationalizations of the attitude construct. These differing treatments of attitude are in turn at least partially responsible for the dramatic variation in attitude-behaviour results that have accrued in the literature. Whereas some early definitions of attitude defined it very globally (G. W. Allport, 1935), others gave it a primarily affective tone (Thurstone, 1931). Others were broader; to wit, in the tripartite model of attitudes (e.g., Breckler, 1984; Katz & Stotland, 1959; Ostrom, 1969; Rosenberg & Hovland, 1960), affective components of attitudes are the pleasurable or unpleasurable emotions or feelings associated with an attitude object, cognitive component are beliefs about an attitude object, and behavioural components are conations or actions toward the attitude object. Unfortunately, different studies on the attitude-behaviour relation have employed widely varying measures that personified these conceptual differences. Coupled with other methodological factors (e.g., Hovland's, 1959, comparison of laboratory to naturalistic field studies), it is no surprise that the literature on attitude-behaviour linkages was marked by widely conflicting results. Wicker's (1969) rudimentary meta-analysis of the literature also revealed correlation coefficients rarely above .30 and often near zero. With Wicker, attitude scholars began to doubt whether the attitude concept maintained any validity at all. Indeed, by the 1970s, attitude research was on the wane within the field of social psychology (Eagly, 1992; McGuire, 1986).

A solution to the problem. Key among those who reinvigorated the field of attitude research was Martin Fishbein. Although in his early work, Fishbein (e.g., 1963) had defined the structure of attitudes as based on beliefs and although he maintained this theoretical stricture in his subsequent work, the measures of attitude that he used were purely evaluative and

permitted input from any source, be it cognitive, affective, behavioural, or other. Along with his colleagues Fishbein commenced on a series of studies and reviews that established a veritable canon for the psychometrics of attitude measurement.

According to Fishbein and Ajzen (1974), distinguishing between attitudes toward *objects* and attitudes toward *behaviours* is essential. Prior measures had often assessed attitudes toward this entity or that, without asking about the respondents' attitudes toward *action* with regard to the entity in question. For most people at most times in most places, it is one thing to measure an attitude toward an object (attitude_{object}), say an international social psychology conference in Sydney, Australia, but quite another to measure an attitude towards a behaviour (attitude_{behaviour}), attending said conference (Fishbein & Ajzen, 1974). The beauty of defining attitudes and behaviours following this conceptualization was that it forced respondents to construe the behaviour more narrowly than historical measures had previously done. More specifically, Fishbein and colleagues (Ajzen & Fishbein, 1977; Fishbein & Jaccard, 1973) maintained that behaviours are composed of four elements: (a) an action (e.g., smoking), (b) target (a cigar), (c) context (at a conference in Sydney), and (d) time (after the keynote address).

As part of their *principle of compatibility* (also popularly called the *correspondence principle*), attitude-behaviour relations are limited to the extent that the measures of attitude and of behaviour match in terms of the stated elements in those measures. Thus, for example, a measure of attitude that merely asks for ratings of the desirability of "smoking" will usually fare very poorly in predicting the behaviour of smoking a cigar at a conference in Sydney after the keynote address. By the same token, attitude toward smoking a cigar at a conference in

Sydney after the keynote address will likely fair very poorly in predicting smoking behaviour defined more generally. Thus, it is not necessary that attitude and behaviour measures be highly specific, only that they correspond to each other in terms of their level of specificity. Attitudes and behaviour can correspond just as highly when both measures are specific as when both measures are general. Substantiating Ajzen and Fishbein's (1977) narrative review, Kraus's (1995) meta-analysis of the attitude-behaviour literature confirmed that studies had much larger attitude-behaviour correlations when they used compatible measures than when they did not.

Perhaps an even more significant contribution to the attitude-behaviour field than Fishbein's measurement canon was the theory of attitude-behaviour relations that Fishbein and Ajzen originated: the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975; Fishbein, 1980). Instead of attitude being the direct cause of behaviour, the TRA postulates that human behaviour is primarily driven by behavioural intention, which is a person's readiness or desire to perform a given behavior. Intention, in turn, is driven by attitudes—defined as we have described—and subjective norms, which are a person's view of how important others would like him or her to behave. If a person accepts that their close others would regard a specific behaviour in a negative light, then it is less likely he or she will perform that behaviour. Fishbein and Ajzen proposed that all other influences on behaviour are mediated through their impact on the beliefs that underlie attitudes and subjective norms. Aspects as widely varied as gender, ethnicity, culture, and past behaviour were elegantly assumed to have their impacts in this fashion, without directly impacting behaviour. Finally, Fishbein and Ajzen advocated measures

that defined each element of the model with compatible elements. To the extent that the measures lacked compatibility, the relations between variables were likely to be low.

Ajzen (1991) later augmented the TRA into the Theory of Planned Behaviour (TPB) by adding a third exogenous variable, perceived behavioural control (PBC). Essentially identical to the concept of behavioural self-efficacy (Bandura, 1997), PBC taps perceptions of control over performing a given behaviour. In the TPB model, PBC affects behaviour directly as well as through the mediating variable of intentions. To the extent that an individual perceives control over a behaviour, he or she will be more likely to enact it. According to both the TRA and TPB, the influence both of subjective norm and of attitude on behaviour is mediated by intention, with no direct impacts of these variables on behaviour. The impact of perceived behavioural control on behaviour is typically mediated through intention, but, when perceived control reflects actual control, a direct relation to behaviour may emerge, independent of intentions.

If citation impacts are used as a gauge of success, the TRA and TPB have been two of the most successful theories that the social sciences have ever produced; hundreds of studies have explored their relations and there have been numerous reviews of this work. As an example, Albarracín, Johnson, Fishbein, and Muellerleile (2001) meta-analysed TRA/TPB studies examining condom use, a focus justified because correctly used condoms are an important protection against the spread of Human Immunodeficiency Virus (HIV) and other sexually transmitted infections (STIs). Albarracín and colleagues collected and analysed 96 independent datasets ($N=22,594$) examining linkages between the variables implied by the TRA and/or TPB, focusing on prospective studies in which the measures were taken at an initial point and then the amount of condom use that occurred by a later point was used as the criterion variable. It is

also notable that these studies tended to sample from non-University-student populations, drawing instead from populations at higher risk for HIV and other STIs, not to mention unwanted pregnancy. Albarracín et al. submitted the matrix of mean correlations of these variables to path analyses and found that both the TRA and the TPB were good-fitting models of this relation. This good fit generalized across a wide array of methodological and sample variations in the source studies, ranging from statistical concerns (studies with completely reported matrices) to forms of condom use (e.g., vaginal vs. non-vaginal) to samples of higher or lower risk for HIV.

By the logic of structural equation modeling, having “good fit” essentially means that the correlations among attitude, intention, subjective norm, perceived behavioural control, and behaviour can be modelled well by knowing the path coefficients for the relations specified by the TRA and TPB. It does *not* necessarily imply that there is a high degree of explanation in the ultimate endogenous behaviour. Indeed, although tests of the model typically showed that all elements relate significantly in the pattern that the TRA and TPB predict (Figure 1), the overall variance explained (R^2) for prediction of condom use was .30 for studies assessing the TRA and .28 for studies assessing the TPB.¹ Armitage and Connor (2001) offered the most comprehensive sample of TPB studies to date and found similar a overall number, .27 for prediction of behaviour. In meta-analyses focusing on different behaviours, prediction of

¹ Because slightly different studies entered into these comparisons, one should not conclude that including perceived behavioural control negatively impacts behavioural prediction. Instead, other differences among the two groups of studies (e.g., time between intention and behaviour measures) are the likely cause. Indeed, Armitage and Connor’s (2001) meta-analysis found that adding PBC increased prediction of behavior, over and above intention, by 2 percent.

behaviour has also varied. For example, Hagger, Chatzisarantis, and Biddle's (2002) meta-analysis examined physical activity as the criterion and found a mean R^2 of .26. As another example, Sheppard et al.'s (1988) cross-behaviour review found studies with R^2 s as low as .01 (for being absent from work) and as high as .92 (for having an abortion).

In sum, the TRA/TPB conceptualization of the attitude-behaviour relation was a major step forward in attitude-behaviour research, particularly when coupled with psychometric developments that Fishbein pioneered with his colleagues, and reinvigorated the attitude field. If attitudes, subjective norms, and perceived behavioural control weigh heavily toward enacting a behaviour, then it is likely the resulting intention would be to perform that behaviour, and for many actions, this relation appears to be genuine. The application of the TRA or TPB has helped to illuminate many phenomena and to guide intervention efforts (e.g., Ajzen, Albarracín, & Hornik, 2007). Although neither the TRA nor the TPB are theories of attitude *change* per se, the pattern of results has important implications for change. For instance, if attitudes relate more markedly to intentions than do either subjective norms or PBC, as is the case with condom use, then a focus on changing attitudes is indicated. Indeed, Albarracín et al.'s (2005) recent meta-analysis of literature related to sexual risk reduction against HIV suggested that provision of attitudinal arguments enhanced condom use (see also Webb & Sheeran, 2006).

Although the TRA and TPB have been supported across numerous disciplines and different behaviours, there are critics and alternative perspectives. First, the assessment of attitudes and behaviours with explicit measures may inflate observed relations. That is, by asking an individual to express an attitude explicitly, we may be in fact changing the attitude in some way, or we may influence the cognitive processes underlying the action in question. For

example, asking a group of researchers to explicitly indicate via RSVP whether they intend to smoke a cigar in the designated smoking room after the keynote address may push a decision that would have previously be an impulsive decision (i.e., non-deliberative) to one that is planned (i.e., intentional).

In addition to the issue of observer effect, how we choose to measure an attitude may also influence its expression. Note that in the tradition of research we reviewed in this section, attitudes are nearly always assessed using bipolar scales. The advantage of a bipolar scale is that it is a relatively simple and face-valid way of measuring an attitude. The drawback is that it may influence how the raters themselves think about their attitudes and behaviour. In the case of attitudes, the use of bipolar scales assumes a bipolar structure and does not permit the assessment of ambivalent attitudes (e.g., Cacioppo & Berntson, 1994). An alternative conception is that attitudes can have a unipolar structure (e.g., neutral-very good; neutral-very bad) and that, while often correlated, unipolar measures of an attitude are at times in conflict (e.g., Scott-Sheldon & Johnson, 2009). To date, if studies have pursued operationalizations that tap unipolar structure, this literature has not been appropriately summarized. In theory, these should be more predictive than the bipolar scales for all except the strongest attitudes.

Another argument, consonant with that in the preceding paragraph, is that people are often minimally rational, relying on heuristics and basic cues as the driving force behind much of their behaviour (e.g., Baumeister, 2005; Sheeran, 2002). Thus, structuring a behavioural prediction model around intentionality may not be universally appropriate. Finally, other critics argue that attitudes toward targets can be important forces in and of themselves (e.g., Fazio, 1990). We develop these themes in the next section.

Recent Developments in Attitude-Behaviour Research

Are psychometric factors the prime determinant of attitude-behaviour relations? Ajzen and Fishbein's (1977) narrative review of measurement compatibility as a factor in attitude-behaviour relations may leave the impression that psychometric factors are the sole explanation for variation in the attitude-behaviour relation, as well as the intention-behaviour relation. Yet, even when measurement accords with the Fishbein-Ajzen psychometric prescriptions, the amount of behaviour explained by these models varies quite widely from study to study and from behaviour to behaviour (see Ajzen & Fishbein, 2005; Sheppard et al., 1988). As a case in point, Albarracín, Kumkale, and Johnson (2004) meta-analyzed an updated literature related to condom use ($k=129$ databases and $N= 30,270$ participants) and showed that when the intention and behaviour measures are compatible, the intention-behaviour relation is much larger than when they lack compatibility. Yet measurement compatibility could not explain all of the variation in intention-behaviour correlations. Among other study differences that related to the magnitude of the intention-behaviour relation was the amount of time elapsed between the attitude and behaviour measures, consistent with Ajzen and Fishbein's (e.g., 2005) position that larger gaps of time give more opportunities for individuals to change their intentions, a pattern also confirmed in primary-level studies (e.g., Sheeran & Abraham, 2003; Sheeran, Orbell, & Trafimow, 1999).

Albarracín et al.'s (2004) report focused on those relations key to the TRA and TPB predictions, as conventionally construed. Although their meta-analysis evaluated the bivariate linkages between compatibility and the lag between the intention and behaviour measures, it did not evaluate the joint effects of these variables and did not examine whether these factors

relate to variation in attitude-behaviour correlations. We provide this analysis, summarized in Table 1. The varying magnitude of the intention-behaviour relation (right-most columns) clearly illustrates the importance compatibility and time lag between the measures in determining the predictive validity of the TRA/TPB. That is, compatibility and time lag between measures each pick up significant variation in the intention-behaviour relation. The intention-behaviour relation can be quite large when the measures have complete compatibility or when the behaviour measures are taken relatively close to the measure of intention. In contrast, the intention-behaviour links drops dramatically as compatibility decreases or time lag increases. Indeed, at a year from the intention measures, the intention-behaviour correlation is nearly non-significant.

Surprisingly, these two measurement factors had a much smaller role with regard to the attitude-behaviour relation, shown in the left columns of the Table. Measurement compatibility did not relate to attitude-behaviour relations, and time related in a similar though smaller fashion than it did with intention-behaviour relations. Of note, the intention-behaviour relationship decayed more rapidly than did the attitude-behaviour relation. Indeed, at the one-year measurement point, the relation of intention to behaviour was actually smaller than the relation of attitude to behaviour. Given that the behaviour is kept fairly constant in these analyses, it appears that attitudes are more stable than intentions, at least in the domain of condom use. Finally, for both sets of correlations, these measurement factors left significant

variability remaining; indeed, the homogeneity values,² which can range from 0 to 100, are relatively high prior to any explanation from the moderators, and the values remain high after their application. These analyses illuminate the point that although psychometric dimensions have a clear effect on the intention-behaviour relation, they may not always have an equivalent impact on the attitude-behaviour link. In short, even after one accounts for measurement-related variables, there may still be significant variability to left explain in the intention-behaviour relation and especially the attitude-behaviour relation.

Toward a more spontaneous view of attitude. The TRA and TPB view of the relation between attitude and behaviour is a primarily deliberative one. Although Fishbein and Ajzen have said their models are *reasoned* rather than *rational*, it seems fair to conclude that these models construe beliefs, attitudes, and their other variables as consciously accessible and as psychological elements that can serve as deliberative input into intentions and behaviour. The TRA and TPB assume that behaviours involve at least some level of deliberation. Other social psychologists have taken the sharply contrasting view that behaviour is often relatively spontaneous. These scholars contend that intentionality can be important, but that the lion's share of behaviour is dictated by automatic processes, independent of intention (Bargh, 1994; Baumeister, 2005; Schwartz, 2000; Wegner & Bargh, 1998). Models of behaviour have in recent years tended to emphasize deliberate processes on the one hand and spontaneous processes on the other (for reviews, see Chaiken & Trope, 1999; Smith & DeCoster, 2000). For instance,

² In the I^2 index, values that differ significantly from zero are interpreted as rejecting the hypothesis of homogeneity. In other words, significant values imply that greater variation is exhibited across the studies than would be expected based on sampling error alone.

Strack and Deutsch's (2004) reflective-impulsive model assumes that these two systems interact but operate differently. Like the TRA and TPB, the reflective system bases behavioural decisions on knowledge about facts and values. In contrast, the impulsive system bases behaviour on associative links and motivational orientations. Hence, although the TRA/TPB are likely to be useful models for deliberative behaviour, their utility is likely to be diminished for more spontaneous behaviours.

Although the notion that the influence of attitude on behaviour is completely mediated by intention is quite popular, some researchers have been more open to the concept that attitudes may directly impact behaviours. Of particular note is conceptual work by Fazio (1990) that made the case that the relation between attitudes and behaviour can be relatively automatic in spontaneous contexts, whereas it can be relatively deliberative in other contexts. Dubbed the motivation and opportunity as determinants (MODE) model, the approach is based on an accuracy motivation and the basic premise is that when motivation and opportunity are high, the influence of attitudes on behaviour is due to effortful reflection. In contrast, when motivation or opportunity is low, the influence of attitudes on behaviour is relatively spontaneous (i.e., non-deliberative), which has seen empirical support (e.g., Sanbanmatsu & Fazio, 1990).

A closer examination of two seemingly disparate lines of research allows us to more closely evaluate the utility of the MODE model approach: aversive racism and condom use with casual and steady partners. First, Dovidio and colleagues' (e.g., Dovidio, Brigham, Johnson, & Gaertner, 1996; Dovidio, Kawakami, Johnson, & Johnson, 1997; Dovidio, Kawakami, & Gaertner, 2002) work on the aversive racism framework largely squares with the MODE model

perspective. Intergroup relation studies provide an important context to evaluate attitudinal phenomena because they so often involve individuals from actual real-world groups that possess differential status. According to the framework, aversive racists have hidden—perhaps unconscious—prejudice against ethnic or racial minority members; these individuals act without prejudice when social norms are clear, but with prejudice when circumstances are more ambiguous. Indeed, Dovidio et al.'s (1996) meta-analysis revealed a stronger link between explicit measures of prejudice and the negativity of interracial behaviour when the behaviour was of a spontaneous nature (e.g., the distance at which someone sat from a minority target) than when it had a deliberate nature (e.g., judging candidates for a position). These predictions were directly confirmed in Dovidio et al.'s (2002) laboratory simulation, with the augmentation that implicit measures of prejudice were employed as well. Implicit prejudice predicted spontaneous behaviour (e.g., nonverbal behaviour such as eye blinks) more markedly than explicit prejudice. Explicit measures of prejudice did not predict spontaneous behaviour but did predict deliberate behaviour. These studies suggest that implicit attitudes will pick up variation in behaviour that explicit attitudes miss, and that it is important, once again, to consider the nature of the behaviour under consideration.

The second area of research relevant to examining the notion that attitudes can directly impact more spontaneous behaviours is work conducted with the Albarracín et al. condom use database. Although there is much to recommend the notion that the best measure of attitude is attitude_{behaviour}, some scholars have maintained an interest in predicting behaviours from attitudes toward targets (viz., attitude_{object}). Many studies evaluating the TPB or TRA also

include measures of attitude_{object} in addition to attitude_{behaviour};³ therefore these variables were coded for in the condom studies database. The TPB and TRA predict that measures of attitude_{object} should negligibly predict behaviour or intention, yet the literature has seldom evaluated these possibilities. In parallel, studies that focus on attitude_{behaviour} rarely examine whether intentions explain away the observed attitude_{object}-behaviour correlations. We evaluated these hypotheses in our meta-analytic database focusing on condom use ($k=58$).

We theorized that condom use (or non-use) in committed, steady partners, relationships is more routinized and deliberate than condom use (or non-use) in new or casual relationships. If so, we should see that direct linkages of attitude_{behaviour} and attitude_{object} to behaviour should be greater for casual partners than for steady partners. We calculated matrices of mean correlations separately for the two types of partners and then fit TRA structural equation models to these correlations, evaluating models in which behaviour is regressed on intention, attitude_{behaviour}, and attitude_{object}. Unfortunately, no study that assessed attitude_{object} also assessed PBC, so the TPB could not be evaluated in this analysis. Results were largely consistent with our hypotheses: Condom use for main partners had much better explanation ($R^2 = .13$) than was the case for casual partners ($R^2 = .070$). Intentions were a much better predictor for main partners ($\beta = .31$) than for casual partners ($\beta = .19$), although each relation achieved significance. More interesting is that attitude_{behaviour} and attitude_{object} each picked up significant variation in condom use that intention did not, and this pattern emerged

³ Similarly, some studies have used attitude toward the object measures instead of attitude toward the behaviour measures, but these are omitted from the analyses summarized in our Table 1 and kept separate in the analyses we describe in the next paragraph.

for each partner type. For main partners, attitude_{behaviour}'s and attitude_{object}'s relations were smaller than the impact of intention (β s = .17 and .08, respectively); with casual partners, the attitudinal influences rivalled that of intention (β s = .13 and .13, respectively).

These results suggest that even relatively subtle differences between behaviours can have important consequences for the variables that relate to them. Moreover, attitudes—both specific and general—can play a more powerful role in predicting behaviour than most studies have reported. Of note, these studies have tended to take the TRA and TPB predictions at face value and *not* assessed the fully saturated models. Consequently, their models could *not* show direct relations of attitude to behaviour. Our conclusion that attitudes play a more powerful role than past studies have shown is even more impressive given that we have used data collected to evaluate the TRA in order to examine a competing hypothesis and shown that measurement artefacts do not adequately explain the attitude_{object}-behavior relation. Our results thus create new conclusions from previously under-analyzed data. One might therefore predict that a review of non-TRA research would prove even more supportive of the role that attitudes plays in behaviour enactment and that intentions to act may not sufficiently explain the observed attitude_{object}-behaviour correlations. The finding that attitudes toward objects can relate directly to behaviour squares with the finding that implicit attitudes can also relate directly to behaviour. We discuss additional relevant research below (see *Other Perspectives on Behaviour*).

Toward a focus on behaviour. Research on the nature and structure of attitudes is copious and complex and the subject of rather large tomes (e.g., Eagly & Chaiken, 1993; Albarracin, Johnson, & Zanna, 2007). Yet, other than the focus on the elements of behaviour

that Fishbein and colleagues' initiated, the subject has been given short shrift. Even a casual observer of behaviour will realize that some behaviours are more easily predicted than others. Similarly, the results we presented above reveal the same pattern. Might a focus on the nature of the behaviour enhance an understanding of attitude-behaviour relations?

If not all behaviours are the same, then attitude-behaviour relations may hinge on important features of the behaviours in question. Indeed, the research we reviewed in the prior section strongly suggests that the nature of the behaviour matters. Condom use with steady partners appears to differ importantly from condom use with new or casual partners. In interracial interactions, nonverbal behaviours such as smiling are far different than judging an applicant's potential worth in a particular professional post.

The complexity of attitudinal beliefs has proven a useful tool in the attitude research field (e.g., they have been associated with greater attitude strength when beliefs are correlated; Bieri, 1966; Scott, 1963; Tetlock, 1989; Zajonc, 1960). Attitudinal complexity has been conceptualized in a number of ways and operated under such names such as differentiation (Zajonc, 1960), dimensionality (Scott, 1963), cognitive complexity (Bieri, 1966), and integrative complexity (Tetlock, 1989); Eagly and Chaiken (1993, 1998) provide reviews. At its most basic, attitudinal complexity is the number of distinct beliefs associated with an attitude.

Recent research on behaviour has extended this concept of complexity to include complexity of behaviour (Boynton & Johnson, 2009). Just as attitudinal complexity gauges the sophistication of the structure an attitude (Bieri, 1966; Scott, 1963; Tetlock, 1989; Zajonc, 1960), the idea of behavioural complexity refers to the sophistication of the structure of a

behaviour. Because attitudes are intangible constructs, the degree of complexity for an attitude for a given attitude object can vary widely. In contrast, whereas there is likely to be a degree of variability among people's assessments of a given behaviour's complexity, it is overall prone to function at a similarly complex way for a specific population, although there will certainly be variability in perceptions of behaviour's complexity between individuals.

In order to test whether the attitude behaviour relation varies as a function of behavioural complexity, attitude, behaviour, and behavioural complexity measures for 46 unique behaviours were administered to 461 undergraduates (Boynton & Johnson, 2009). The behaviours were sampled from the broader attitude-behaviour literature to represent a wide array of complexities, and our participants' judgments confirmed that they do differ considerably. Smiling back at someone and smoking a cigarette are examples of relatively simple behaviours whereas applying for a promotion and quitting smoking are examples of relatively complex behaviours. Repeated-observations multi-level modeling (MLM) permitted the examination of the idea that behavioural complexity predicts the strength of the attitude-behaviour relation.⁴ The results of the analyses show that both the main and interaction effects of attitudes and complexity predict behaviour ($ps < .001$). Specifically, as complexity increases, the predictive power of attitudes decreases, with more strongly held attitudes showing the greatest drop. In other words, complex behaviours show a weaker attitude-behaviour link than

⁴ The main and interaction effects for attitudes and the M complexity scores (linear and quadratic effects) were calculated. Variables were initially tested as random effects, and because the resulting slopes were non-significant, were subsequently treated as fixed effects. Further, model fit was assessed with the addition of each new variable, and variables were only kept if they significantly improved model fit using the χ^2 difference test for the -2 log likelihood statistic.

simple behaviours. Given that simpler behaviours are more likely to be non-deliberative this finding supports the notion that attitudes most directly impact spontaneous behaviours. Once again this research supports the conclusion that not all behaviours are the same and that the nature of the behaviour under consideration can be key.

Other Perspectives on Behaviour

Evolutionary perspectives assert that human beings are never perfectly blank slates (Pinker, 2002; Tesser, 1993), but it is clear that attitudes are quite elastic (Schwartz, 2000). The review of research above highlighted how attitude-behaviour relations are subject to measurement aspects (e.g., compatibility, time lag between measures) and competing variables (e.g., intentions, automatic cognitive processes). In this final subsection, we consider alternative conceptions of behaviour. A first aspect is alluded to by our demonstration that attitude-behaviour relations differ for different behaviours. Attitudes toward using condoms relate differently to condom use depending on the target of the action (steady vs. casual partners). In this instance, different attitudes may well be at work, but so also is an interaction of the individual with different people who may co-act. The implication of present knowledge is that the individual attitudes are insular, separate from each others, but the reality is that they are usually correlated. Unfortunately, past research has seldom considered intra-attitudinal structures. Condom use is once again a case in point. An instance of condom use can be modeled as we have shown in this chapter, but these efforts almost always consider only a single attitude. Also relevant would be attitudes and subjective norms toward having sex with a particular partner, attitudes toward pregnancy, attitudes toward STIs, attitudes toward purchases of prophylactics (and alternatives), to name but a few. Related is the fact that

research has tended to focus on a single person, when in fact sexual behaviours such as condom use are by definition co-acted. Almost no research has examined these interdependencies (for an exception, see Etcheverry & Agnew 2004). Finally, elicited attitudes may well be tapping allied attitudes within the cognitive system. Smith-McLallen, Johnson, Dovidio, and Pearson (2006) examined the often-replicated finding that Whites express implicit attitudes in favor of Whites and against Blacks but do not hold differential explicit attitudes toward these two groups. In three studies, they found that Whites' implicit preferences for the *colours* black versus white explained nearly all of the variation in their implicit preferences for the *races* Black versus White. Remaining to be answered is whether these implicit attitudes toward colours actually relate to intergroup relations, controlling for such variables such as we have reviewed in this chapter. We predict that they will prove predictive of spontaneous interracial behaviours such as Dovidio and colleagues have examined.

A hallmark of social psychology since its origination (e.g., F. H. Allport, 1924; Triplett, 1898) that has continued to the present day (e.g., Reis, 2008; Ross & Nisbett, 1991; Zimbardo, 2007) has been its emphasis on social situational factors that shape behaviour. For instance, Bargh and his colleagues' (Bargh, Chen, & Burrows, 1996) so-called chameleon effect studies demonstrated that people will act more rudely, walk more slowly, and respond with more hostility when they are primed with rude, elderly, and African American stereotypes, respectively. More recently, Williams and Bargh (2008) demonstrated that experiencing physical warmth promotes interpersonal warmth with regard to a target other: Participants who had held a hot (vs. cold) drink (or a "therapeutic pad") were more likely to take a gift for a friend than a personal reward in exchange for participating in the study. The mediation of such

effects is typically understood as activating perception-action links, over-learned tendencies that are triggered by situational cues. Another possibility that is consistent with perception-action links is priming of attitudes, which Bargh, Chaiken, Gollwitzer, and Pratto (1992) have shown can occur even for weakly held attitudes. It is ironic and a loss for the field that the literature on perception (e.g., Ross & Nisbett, 1991) so rarely mentions the attitude concept. Many studies' assessments of "perception" (e.g., an impression of friendliness) are essentially attitudes by another name (e.g., liking of a target person). The same omission occurs in the literature on attitudes, routinely omitting consideration of perception. Indeed, the study of attitude change is literally the study of how social situations make attitudes adjust (Johnson et al., 2005). The attitude and perception literatures would profit from a knowledge exchange, and the result would be better integration of social psychological knowledge.

The concept of over-learned perception-action (*and* attitude-behaviour) linkages tacitly acknowledges that past experiences are important, even crucial, to understand behaviour. In turn, the mechanism of automaticity underlying behaviours may be considered highly adaptive because it frees up other cognitive resources that can be utilized for other things (Bargh & Chartrand, 1999). In short, habits would appear to underlie much human behaviour, but contemporary habit perspectives are more sophisticated than this statement would imply. Past behaviour is not sufficient to produce future behaviour, despite the tired adage that "the best predictor of behaviour is past behaviour."

The most prominent contemporary perspective on habit builds on the auto-motives perspective (Bargh, 1994) mentioned above. Specifically, Ouellette and Wood (1998) contend that although many behaviours are intentionally driven they are, in some cases, habitual, and

therefore operating independent of behavioural intentions. Using this framework it is reasonable to believe that one over-arching intention can set into motion a whole series of sub-behaviours that result in the desired end being met. Instead of defining habits as a function of repetition, this framework maintains that when a behaviour is performed frequently enough in a stable context, the environmental cues that are present in that context are sufficient to elicit that behaviour, independent of a process involving intention. The implication is that past behaviour can directly influence future behaviour when contextual cues are constant. For instance, it could be that whereas a person might initially form the intention to put on a seatbelt after entering a motor vehicle, after repeated times enacting this behaviour, the act of simply entering a motor vehicle is enough to cause the buckling of a seatbelt, even when this action is not necessary (e.g., the vehicle is only going to be driven a few feet). Wood and her colleagues (e.g., Ouellette & Wood, 1998; Verplanken & Wood, 2006; Wood, Quinn, & Kashy, 2005; Wood, Tam, & Witt, 2005) present a great deal of evidence from meta-analyses and original studies that squares with the theory. Past behaviours that are repeated appear to lead to future behaviours when contexts remain relatively stable, whereas apparent “habits” are broken when contexts change. Finally, the influence of past behaviours appears to emerge even without conscious thought (Wood, Quinn, & Kashy, 2005). To date, this research has not controlled for implicit attitudes’ impact on behaviour when examining whether past behaviours relate to future behaviours. It is possible that implicit attitudes are the proximal mechanism driving the pattern.

Like Wood and her colleagues, Marsh, Scott-Sheldon, Johnson and colleagues (under review) investigated the role of past behaviour on future behaviour by examining condom use

in two prospective studies of college undergraduates. In addition to traditional (i.e., explicit) measures of attitude, there were also measures of implicit attitudes toward condoms, taken using standard implicit association test procedures (Greenwald, McGhee, & Schwartz, 1998). As previously mentioned, condom use with main partners constitutes a relatively constant situation, whereas casual, new partners implies novelty. As the habit-perceptive would predict, for main partners but not casual partners, past condom use related significantly to future condom use. For casual but not main partners, implicit attitudes significantly related to condom use. Both of these patterns were present controlling for intentions. Consequently, implicit attitudes could be the underlying mediator of habitual behavioural patterns.

it is also worth noting that researchers in the auto-motives tradition often select relatively simple behaviours to demonstrate situation-cued, spontaneous, phenomena and largely excluded complex behaviours.⁵ This approach makes sense given that complex behaviours are unlikely ever to be a simple function of a situational trigger. In contrast, eye blinking rates and smiling would seem chronically triggered by situations and rarely intentional. In the face of this perspective, it is tempting to conclude that researchers in the reasoned action tradition have chosen relatively complex, deliberative behaviours. Yet, our survey found that they have selected a fairly wide array of behaviours (Boynton & Johnson, 2009. Given that our data demonstrate that the predictive utility of the TPB (as measured by model fit)

⁵ One exception is performing well at an intellectual task (Bargh et al., 2001), but given that this research examined college undergraduates, who have a chronic goal of performing well at intellectual tasks, it seems reasonable that for this population the behavior is relatively simple, over-learned.

decreases as behavioural complexity decreases, the TRA/TPB may not be a universally appropriate model of behaviour.

Conclusions

After nearly a century of research investigating measures of attitude, it is clear that social scientists understand them very well. It is also evident that attitudes often impact behaviours, either directly or indirectly. The field has also successfully identified some key attitudinal dimensions that moderate attitude-behaviour linkages (e.g., behavioural intentions). Measurement issues such as the observer effect, scale structure, time lag, and measures correspondence all have important roles in influencing the size of the attitude-behaviour link. Additionally, recent work on automatic cognitive processes, habits, and implicit attitudes suggest that the effect of attitude on behaviour is not solely an explicit process.

Perhaps most importantly, past attitude-behaviour reviews have left many inconsistencies unexplained. One possible avenue of inquiry for resolving these mysteries is by better understanding the dimensions of behaviour. Behavioural complexity offers itself as one potentially meaningful way to categorize behaviour. In brief, behaviours vary in their complexity, and as complexity increases, the utility of attitude-like variables decreases and the importance of other factors increases. Behavioural complexity may one day help scholars pick the attitudinal dimensions that are most relevant to explaining variation in different behaviours. As William James asserted in our opening epigraph, as you think, so shall you be, and it can change your life. The twist is that our experiences in life also changes how you think.

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Table 1. *Measurement Factors as Incomplete Moderators of Both Attitude-Behaviour and Intention-Behaviour Relations, drawn from Albarracín, Kumkale, and Johnson's (2004) Meta-analytic Database Related to Condom Use.*

Moderator or statistic	Level	Attitude-behaviour r_s		Intention-behaviour r_s	
		r_+ (95% CI) ^a	β	r_+ (95% CI) ^a	β
Measurement compatibility			0.04		0.56***
	Complete	.38 (.35, .41)		.55 (.53, .58)	
	Partial	.36 (.30, .41)		.33 (.30, .35)	
Time lag between measures			-0.22**		-0.44***
	30 days	.41 (.38, .44)		.60 (.57, .62)	
	365 days	.21 (.074, .34)		.12 (.026, .21)	
Homogeneity of r_s before moderators ^b		$I^2 = 73.79***$		$I^2 = 90.32***$	
Variance explained by moderators		$R^2 = .053^*$		$R^2 = .45***$	
Homogeneity of r_s after moderators ^b		$I^2 = 73.71***$		$I^2 = 84.90***$	
k of studies		$k = 44$		$k = 41$	
N of participants		$N = 8,098$		$N = 8,076$	

Note. Positive correlations (r or r_+) imply stronger linkages between the respective variables. The two moderator variables were entered simultaneously as predictors in a fixed-effects regression analysis with weights equivalent to the sampling error of each correlation, where the correlations were represented as Fisher's z values and transformed back to r for display purposes. ^aTabled r_+ values control for the presence of the other moderator. ^bSignificance implies a rejection of the hypothesis of homogeneity and the presence of more variability than expected by sampling error alone.

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

Figure Captions

Figure 1. Theory of Planned Behaviour path model based on an entire literature ($k=96$ studies) related to a single behaviour, condom use.

