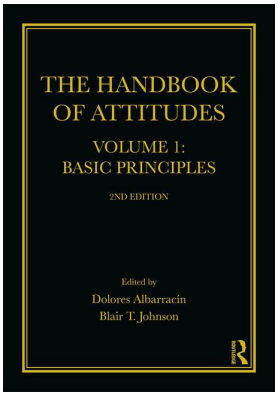

The Handbook of Attitudes
Volume 1: Basic Principles

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Attitudes in the 21 st Century

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ATTITUDES IN THE 21ST CENTURY

Accomplishments, Challenges, and Gaps

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Introduction

A century has passed since W. I. Thomas and Florian Znaniecki (1918) published five volumes documenting the experiences of Polish immigrants in Europe and North America; they interviewed countless immigrants and richly explored topics that would become the standard stock of modern attitudes research. This seminal work illustrated the immigrants' complex of beliefs and documented how they assimilated or shunned the attitudes and fashions of the communities they joined. Thomas and Znaniecki's study stimulated a new generation of researchers who, building from the authors' initial qualitative methodology, gradually turned toward quantitative methods. Over time, researchers adopted a definition of attitudes as *evaluations*, that is, some tendency to like or dislike a person, object, or other entity; we also follow this definition in this chapter. At their core, positive attitudes are held toward things that please or otherwise reward us and negative attitudes are held toward the opposite.

A century after the first formal research on the subject, contemporary events continue to show the significance of attitudes to everyday life. Attitudes help us to navigate through a complex world. They provide guidance for decisions which products we buy, which job offer we accept, or who we select as romantic partners. Attitudes often span generations; parents try to train their children to like the same cultural emblems that they like. Advertisers track consumers' shopping tendencies and then use this information to place advertisements to motivate a purchase. Politicians address audiences directly or through media to garner support for their campaigns or proposed policies. In contrast, attitudes are also related to prejudice and outgroup derogation, and they also promote dysfunctional behavior like smoking, drinking, or phobic reactions. Notwithstanding the evaluative tone or content of attitudes, they have a built-in tendency to persist and to remain stable even in the context of counterattitudinal information: People prefer to maintain consistent attitudes and actively seek information that confirm the beliefs they hold. Attitudinal phenomena also can be sensational: In the U.S., at a White nationalist rally, a young man plows his vehicle into a crowd of counterprotesters,

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acting on hatred and anger. An elected official is exposed as an exhibitionist, proud of his private parts and eager to display them publically. No matter whether mundane or sensational, clearly, attitudes are central to social life. They are also central to numerous subdisciplines of psychology (e.g., social psychology, health psychology, developmental psychology, clinical psychology) and other disciplines (e.g., communication, political science, marketing, business, anthropology, sociology, and economics).

The rich scholarship in the chapters of both volumes of this *Handbook of Attitudes* bears stark testimony to the fact that, scientifically, very much is known about attitudes and how they interrelate with behaviors, both as a cause and as an effect, and how they relate to other phenomena. This work documents not only more conceptual or theoretical statements about attitudes and the research that is relevant to these perspectives (Volume 1), but also more specific domains where attitudes are examined in relation to problems that are important in human life and dealings (Volume 2). In this chapter, we first (a) summarize the chapters in this first volume of the *Handbook* by extracting what we consider the more notable and robust findings about attitudes, drawn from the multitude of findings in the literature. This volume emphasizes attitudinal science that is primarily basic or conceptual; these are the *principles* of attitudes writ large. We then (b) use these findings and principles as a lens through which we learn about attitudes in what are often regarded as *applied* areas of research. These applied areas of attitude research are covered in the second volume of the *Handbook*, and we leave it to Nolder and Blankenship (Volume 2) to provide a more comprehensive summary of that volume. Our chapter then (c) uses the foregoing material to identify some important challenges for the future of attitudes research, drawing as well from chapters in this volume. In the finale of this chapter, we (d) provide conclusions about the importance of attitudes in the larger scheme of things.

Robust and Important Attitude Principles

In a carefully crafted review written in part to commemorate 100 years of psychology in America, Alice H. Eagly (1992) described four domains of elaborate and robust attitude research: attitude-behavior relations, attitudinal selectivity (preferring information supportive to one's attitudes), persuasion, and cognitive dissonance, which Eagly labeled *attitudinal advocacy*. Inspired by her example, this chapter profiles a selection of attitude findings that have a robust evidence base, drawn from across the more theoretically inclined areas of attitude research, but also with an eye to their practical importance. Of course, each of the principles may be qualified by one or more boundary conditions, and we note such complexities in addition to other potential limitations in Table 16.1, which roughly orders the principles from more elemental to more social; it provides reasons why each principle is important, noting relevant limitations and providing central citations. It is important to note that we do not claim to have listed *all* robust and important attitude findings, just those that help tell a rounded scientific story, one that shows attitudes not just as an intrapsychic phenomenon—as elements held with in one person's brain—but also as a deeply social phenomenon. The story also provides a brief historical summary of the field's accomplishments.

1. Explicit Attitudes Can Be Measured

On the most elemental end of these principles is Thurstone's (1928) pithy statement that "attitudes can be measured." That they indeed can be measured makes a science of attitudes possible, so this principle seems essentially axiomatic, although Thurstone was not the first to measure attitudes quantitatively (cf. Allport & Hartman, 1925; Bogardus, 1925). Nonetheless, at the time, it appears that most scholars considered attitudes from a more qualitative standpoint; Thomas and Znaniecki's (1918) study was a prominent example of the science plied in this fashion. Thurstone's equal-appearing-intervals scale was very careful psychometric work, although practically

Table 16.1 Selected Robust and Important Attitude-Relevant Principles in This Volume, From More Elemental to More Social, With Importance and Limitations Noted

Principle and Key Citations	*Why It Is Important*	*Notable Limitations*
1. **Explicit attitudes can be measured.** *Thurstone (1928)* *Likert (1932)*	Reliable and valid measures are necessary for science. Flexibly accommodates nearly any object or other entity.	No measure is perfect (e.g., social desirability for some issues); many versions of measures are available; structure of attitudes is a challenge (e.g., evaluation vs. importance vs. moral basis).
2. **Implicit attitudes can be measured.** *Fazio, Jackson, Dunton, and Williams (1995)* *Greenwald, McGhee, and Schwartz (1998)* *Payne, Cheng, Govorun, and Stewart (2005)*	Reliable and valid measures are necessary for science.	No measure is perfect; many versions are available. Linkage to behavior is difficult because implicit measures tend to be general in nature (and behavior is usually measured more specifically). Some critics charge that some implicit measures are psychometrically flawed.
3. **Attitudes are automatically activated.** *Fazio, Govender, Kardes, and Powell (1986)* *Bargh, Chaiken, Govender, and Pratto (1992)* *Bargh and Ferguson (2000)*	A mental construct that is automatic has greater chance of influencing actions.	Some debate the conclusion that stimuli activate even weakly held attitudes. Of course, competing attitudes simultaneously activated may prevent an activated attitude from having an influence on behavior.
4. **Explicit attitudes predict behavior.** *Ajzen and Fishbein (1977)* *Glasman and Albarracín (2006)* *Webb and Sheeran (2006)*	Without predictive validity, attitudes are useless, and this principle has been evaluated in many diverse literatures. Attitudes are implicated in self-regulation.	Predictive validity drops with increasing temporal lags and when attitude and behavior measures differ (e.g., along target, action, context, and time dimensions). Self-regulation researchers commonly gloss over associations with attitudes literature, so it is not well understood theoretically.
5. **The reward in habitual behaviors is attitudinal.** *Verplanken and Orbell (2003)* *Wood (2017)*	Past behavior often relates to future behaviors even when controlling for attitudes, intentions, etc. Factors that influence behavior over and above attitudes are important to counter when attempting to change attitudes.	Measures of habit outside of past behavior *per se* are relatively new. Difficult to interpret past behavior as purely a measure of habit. Addictions also involve a purely biological component.
6. **Evaluative conditioning affects attitudes.** *Staats and Staats (1958)* *Dijksterhuis and Aarts (2010)*	Incidental factors out of awareness may affect attitude formation even though unrelated to the entity.	Attention to pairings of novel stimuli with known objects may increase the effect; pairings in awareness generate larger effects than those out of awareness.
7. **Repeated exposure to a stimulus pushes attitudes from neutral to positive.** *Zajonc (1968)* *Montoya, Hortoor, Vevea, Citkowicz, and Lauber (2017)*	Conditioning may be an evolutionary signal of safety or fear; commercial and social marketing rely on it.	Diminishing returns after extensive exposures, especially for adults, but children do not show effect.
8. **Direct experience with an object creates stronger or more extreme attitudes.** *Glasman and Albarracín (2006)*	Attitudes are to some extent grounded in knowledge and affective reactions generated at the moment.	Inconsistent reactions during experience creates more neutral attitudes.

(*Continued*)

Table 16.1 (Continued)

Principle and Key Citations	*Why It Is Important*	*Notable Limitations*
9. **Public endorsements of a position generate more favorable attitudes toward it.** *Festinger (1957, 1964)* *Bem (1967)*	Attitudes help make humans social beings: Other people—and their reactions—matter.	Effect is more pronounced in attitude formation than in attitude change. Some unexplained heterogeneity in study findings.
10. **Message elaboration generates stronger and more polarized attitudes** *Petty and Cacioppo (1986)* *Visser and Mirabile (2004)*	Stronger, more polarized attitudes are more likely to affect behavior.	Many factors increase or decrease elaboration (e.g., relevance, need for cognition); stronger attitudes are more likely to relate to behavior. There are many interactions of these variables with other factors (e.g., mood, message length, motivated reasoning, network features).
11. **Strong arguments are more persuasive.** *Chaiken (1980)* *Petty and Cacioppo (1986)* *Johnson and Eagly (1989)*	When elaboration is high, message content determines agreement.	Effect appears linked to those with stronger accuracy motivation. Meaning of "strong" or "weak" arguments remains ambiguous.
12. **Strongly held attitudes are resistant to change** *Katz (1960)* *Sherif et al. (1965)* *Johnson and Eagly (1989)* *Howe and Krosnick (2017)*	Strong attitudes are attached to matters people find personally important.	Confounds such as prior knowledge or ties to social groups may explain many resistance patterns.
13. **Inoculating against future messages engenders resistance.** *Taffel (1955)* *McGuire (1964)* *Sagarin, Cialdini, Rice and Serna (2002)*	Beliefs and attitudes serve as anchors for new experiences	Long-term implications for behavior have not been demonstrated.
14. **Sources with positive cues are more persuasive.** *Hovland and Weiss (1951)* *Cialdini (1981)* *E. J. Wilson and Sherrell (1993)* *Petty, Wheeler, and Bizer (1999)*	Marketers and other sources often rely on this principle to increase acceptance; cue effects are similar to leadership effects. People need guidance when cues for behavior are ambiguous.	Often not investigated in relation to stronger attitudes; sometimes cues serve as arguments. The power of social cues depends on culture.
15. **Attitudes enable motivated reasoning.** *Brehm (1966)* *Kunda (1990)* *Nickerson (1998)* *Taber and Lodge (2006)*	Attitudes operate as biases in thinking and preserve themselves, a key process in denial.	Overall effect size of phenomena like selective exposure are small to moderate in size; numerous factors moderate effects.

intensive. The greater amount of work necessary to use equal-appearing-intervals means that scholars seldom use Thurstone-style scales today, as Krosnick et al. (this volume) review. Nonetheless, the psychometric principles that guided this work have permitted modern scholars to develop and use simpler, more elegant measures that stand up well to the test of time, although no scientific measure can claim perfection. As Fabrigar and colleagues (this volume) narrate, the structure of attitudes offers important challenges for attitude measurement, such as how to represent competing attitude structures simultaneously (e.g., attitude importance vs. functions). Similarly, as Krosnick et al. (this volume) conclude, there also is no clear consensus on which measure is best for a particular phenomenon; their summation offers much practical advice that both seasoned and novice attitudes scholars would be wise to follow in the next century of research on attitudes.

2. Implicit Attitudes Can Be Measured

In the last three decades, implicit measures of attitudes have been a popular research focus because scholars believe that hidden or unconscious attitudes may prove quite influential for some behaviors, as psychodynamic theorists posited generations ago (see, e.g., Westen, 1999). As Gawronski and Brannon (this volume) and Krosnick et al. (this volume) review, there are several measures that have shown reasonable reliability, although critics have argued that there are fundamental problems in the psychometrics underlying some of them. As Ajzen et al. (this volume) review, the evidence about implicit attitudes' linkages to behavior is mixed once scholars control the influence of explicit attitudes. We return to this issue below in the section entitled "Challenges for the Future of Attitude Research." Of note, implicit attitude measures take a much more indirect approach than explicit attitudes. Nonetheless, like explicit measures, they still require overt actions such as a button press (rather than circling a number or clicking on scale point). Importantly, neuroscience approaches now document attitudinal processes inside the brain, which means that overt behaviors are no longer required to "see" attitudes inside the brain (Corlett & Marrouch, this volume).[1]

3. Attitudes Are Automatically Activated

This principle is tacitly implied by the foregoing principle, that implicit attitudes can be measured. Fazio, Sanbonmatsu, Powell, and Kardes (1986) used a priming procedure to determine that attitudes can be automatically activated after exposures to words. This finding is important because, unless a mental construct is activated, it cannot influence thought, perceptions, or action. Extending this work, Bargh, Chaiken, Govender, and Pratto (1992) found that even weakly held attitudes are automatically activated, and as Fazio's (2001) review documented, subsequent work replicated these findings using widely varying conditions and stimuli, plus conducted in numerous laboratories. The effect even occurs using odors as stimuli (Hermans, Baeyens, & Eelen, 1998). The fact that attitudes are automatically activated by stimuli makes it possible that people will act without awareness that their behavior has been primed (e.g., Bargh & Ferguson, 2000), the so-called *chameleon effect*. Unfortunately, this effect has been controversial, with many studies unable to produce it, although a meta-analysis found that experimental evidence is generally supportive (Weingarten et al., 2016). Of course, if multiple attitudes are active and relevant at a single time, then it seems less likely that any one of them will influence behavior. The fact that attitudes are automatically activated should not be taken to mean that they do so completely out of awareness, as many times people are conscious of them (see Gawronski & Brannon, this volume). Finally, the automatic activation effect is also an important process related to motivated reasoning, the final principle of our listing.

4. Explicit Attitudes Predict Behavior

Early scholars of attitudes research faced a problem: They assumed that verbal attitudes would predict behavior, yet more and more research suggested very modest associations (Wicker, 1969). As Ajzen et al. (this volume) explain, general attitudes *can* and do predict behavior, but only if the measure of behavior is general enough as to be representative of the attitude (i.e., principle of aggregation). Moreover, individual behaviors are influenced by a number of factors related to the person, context, and the attitude itself. When measuring behavior and attitudes, the principle of compatibility demands that the target, act, context, and time (TACT) in the two measures must be the same, or else they will correlate less markedly. An attitude toward, say, world peace is quite general and only includes a target; the behavior of contributing $100 (action) to an institution (target) whose purpose is to halt human rights abuses (context) before the end of the year (time) is much more specific. There is little chance of a strong correlation when the measures have marked incompatibility. Moreover, longer time lags between measurement of attitudes and measurement of behavior decrease attitude-behavior correspondence (e.g., Johnson & Boynton, 2010), presumably because other cues for the behavior emerge or because salient factors influence and alter the attitudes. This process indicates attitudes are highly relevant to self-regulation processes, a subject we address directly in the section entitled "Challenges for the Future of Attitude Research." In further items below, we expand on conditions that make attitudes more predictive of behavior.

5. The Reward in Habitual Behaviors Is Attitudinal

Robust evidence shows that people develop habits for actions that are frequently enacted in particular contexts (e.g., Ouellette & Wood, 1998; Wood, 2017), and many of these habits form in relation to entities toward which people hold positive attitudes, such as sweet or rich foods (e.g., Bartoshuk, Duffy, Hayes, Moskowitz, & Snyder, 2006). Habits are enacted in part because they are linked to the reward centers of the brain (Corlett & Marrouch, this volume; Kelley, Wagner, & Heatherton, 2015); they give pleasure or satisfy a need (e.g., Clore & Schnall, this volume), and such behaviors come under the control of stimulus cues, thereby bypassing intentions and perceptions of behavioral control (Ajzen et al., this volume). The rewards themselves help to create positive attitudes, and punishments help to create negative attitudes. At their extremes, attitudes can be seen acting in biological addictions in the form of cravings, savoring, and arousal (Garland, 2016; for a review, see White et al., Volume 2). In essence, habits form because the behavior in question is rewarding, and it is pleasurable to experience (it generates positive attitudes toward the behavior in question). In turn, the reward centers are sensitive to context: The behavior is engaged in certain places and times, so those are also linked to the memories and when encountered, these contexts trigger powerful impulses to act. As Ajzen et al. (this volume) discuss, the frequency of past behavior should probably not be considered solely a measure of habit or habit strength, as shared method variance is a tantamount concern, but considerable work has addressed habit strength independently of behavioral frequency (Verplanken & Orbell, 2003). These measures commonly explain future behaviors over and above that explained by popular behavior models as the theory of planned behavior (TPB; e.g., Ajzen et al., this volume) showing how attitudes can influence behavior through automatic, non-intended processes when contexts are stable. It would appear that, when TACT elements are invariant, then attitudes (and subsequent behavior) are difficult to change.

6. Evaluative Conditioning Affects Attitudes

As Clore and Schnall (this volume) review, attitudes toward new entities are linked to existing attitudes through a process similar to Pavlovian (classical) conditioning, known as *evaluative priming* (Staats & Staats, 1958). Specifically, a novel stimulus is paired with one towards which recipients

hold positive or negative attitudes, and the pairing generalizes to the new stimulus (e.g., Walther, 2002). People who meet during a positive event are more likely to become friends or romantic partners, for example. In pure classical conditioning, awareness of the contingency would not be necessary, but, as Nierman's (2008) meta-analysis showed, evaluative conditioning effects are larger when people are aware of the contingency than when they are unaware. Similarly, evaluative conditioning depends on at least some goals that are active during the contingency (e.g., Corneille, Yzerbyt, Pleyers, & Mussweiler, 2009). Finally, the effects of evaluative conditioning appear to persist longer than the effects of classical conditioning (Lipp & Purkis, 2006).

7. Repeated Exposure to a Stimulus Pushes Attitudes From Neutral to Positive

Robert B. Zajonc (1968) was the first to demonstrate that repeated exposures to a stimulus generates attitudes toward that stimulus (whether Chinese ideographs or other people) that are more positive. Known as the *mere exposure effect*, this result has been widely replicated and is one of social psychology's most robust findings. Through their sales figures, advertisers surely understand that audiences very slowly tire of repeated advertisements (see Rucker & He, Volume 2). Montoya, Hortoor, Vevea, Citkowicz, and Lauber's (2017) recent meta-analysis of 268 estimates of mere exposure effects documented that attitudes become increasingly positive with increasing exposures until an apex around 25 to 28 exposures for photographs, paintings or drawings, and nonsense words. It was much longer, about 73 exposures, for ideographs such as Chinese characters. The quadratic shape was especially noted for adult samples, whereas for children, mere exposure slopes were flat such that *any* number of exposures elicited liking, even just one. The quadratic shape was also more evident on measures of goodness than on measures of liking, suggesting that the effect depends somewhat on the affective system (if goodness is affective). Interestingly, the mere exposure effect appeared in studies with subliminal exposures but the effect was of the same magnitude, overall, as studies with conscious exposures. Montoya et al. provided a new model that incorporates cognitive systems and processes in relation to attitudinal systems; the model attempts to provide better integration and makes new predictions about mere exposure effects (see Wegener, Clark, and Petty, this volume).

8. Direct Experience With an Object Creates Stronger or More Extreme Attitudes

As Wyer (this volume; see also Wyer & Albarracin, 2005) attests, beliefs acquired directly are more marked than those acquired indirectly, such as through exposure to others' behavior or statements. Attitudes based on these beliefs are, in turn, more predictive of intentions and behavior, as Glasman and Albarracín's (2006) meta-analysis demonstrated. This review also showed that, when inconsistent information was received (e.g., two-sided messages), attitudes were less predictive of behaviors. Glasman and Albarracín also theorized that attitudes built on affectively driven aspects would create stronger attitudes, but this prediction was not confirmed. Work on affect and attitudes such as Clore et al.'s (2001) affective immediacy principle also suggests that immediately experienced affect creates more valenced attitudes (see Clore & Schnall, this volume).

9. Public Endorsements of a Position Generate More Favorable Attitudes Toward It

Along with his students, Leon Festinger produced many demonstrations of dissonance phenomena: Those paid less to lie about a boring study liked the study more than those paid more; participants who endured a more severe initiation to join a discussion group liked it more; and so on. Because

these demonstrations flew in the face of the dominant theoretical paradigm of the day and supported social psychologists' preferred explanation, psychological factors such as perceptions and attitudes, Festinger and his students triggered what some have dubbed "the decade of dissonance," but as Vallacher (1992) recounted, the numerous studies that then appeared did not regularly replicate these findings (see also Stroebe & Strack, 2014).

Ultimately, scholars were able to produce dissonance effects routinely. As Harmon-Jones et al. (this volume) recount, to succeed in replicating the original Festinger and Carlsmith's (1959) $1 and $20 findings, studies had to make actors feel responsible for telling a lie (Linder, Cooper, & Jones, 1967) and to ensure that this lie may harm the other person in some way (Cooper & Worchel, 1970). It took Zanna and Cooper's (1974) compelling experiments to demonstrate that cognitive dissonance manipulations actually create a motivational state (e.g., heightened arousal). Ultimately, comparative research has shown that most (if not all) primates exhibit dissonance processes, but these are not evident in other species, such as parrots and bears (e.g., West, Jett, Beckman, & Vonk, 2010).

Daryl Bem (1967) argued that findings such as in Festinger and Carlsmith's (1959) $1 and $20 experiment, where more liking appeared in the lower reinforcement ($1) condition, could be understood as *self-perception* effects. Thus, rather than a dissonance-like state driving attitudes, a *perception* or *appraisal* of what actions are reasonable in the situation drove attitudes. It is as though participants in the $1 condition said to themselves, "If I lied about the study for only a dollar, then I must like it"; in the $20 condition, participants found the reward more than sufficient to justify lying. Ultimately, research showed that Bems' account occurs when attitudes are new or relatively weak and that Festinger's motivational explanation is what occurs when the advocacy opposes an established or relatively strong attitude (Harmon-Jones et al., this volume). Notwithstanding these regularities, there is some variation in dissonance results that goes unexplained and that deserves future attention.

10. Message Elaboration Generates Stronger and More Polarized Attitudes

Petty and Cacioppo's (e.g., 1986) elaboration likelihood model of persuasion highlights two general routes to persuasion, one central and the other peripheral. The central route occurs when an individual is highly motivated and capable of thoroughly evaluating a topic, weighing evidence, and reaching what seems to the person as a reasoned attitude. Effortful thinking generates thoughts in alignment with message content, as well as stronger attitudes, a mechanism that Chaiken (e.g., 1980) labeled *systematic processing*. Attitudes that are formed based on higher amounts of elaboration become stronger and are more likely to affect behavior (Johnson et al., this volume; Petty, Haugtvedt, & Smith, 1995; Petty & Wegener, 1998). What is less clear is that such effects also occur when attitudes already exist and are polarized or otherwise strong, which we list in Principle 12 below.

11. Strong Arguments Are More Persuasive

Numerous experiments have documented that strong arguments are more persuasive than weak arguments, especially when motivation to process the message is high (e.g., Johnson & Eagly, 1989; O'Keefe, 2013). Conventionally, "strong" arguments elicit a profile of predominately positive thoughts and "weak" arguments the converse. Consequently, the content of the arguments is often confounded with their quality, and it is difficult to make the case that it is the strength of the arguments that drives attitudes or the logical structure of the arguments. Another possibility is that strong arguments are more persuasive because they describe consequences that are more positive for message recipients, and for weak arguments the reverse is true (Johnson, Smith-McLallen, Killeya, & Levin, 2004).

12. Strongly Held Attitudes Are Resistant to Change

The foregoing principles help to show that, once formed, attitudes continue moving in the direction they first start, either positive or negative. Accordingly, as Fabrigar et al. (this volume) review, the more polarized an attitude is, the more likely it is to be held with greater conviction and to be more stable over time even in the face of counterattitudinal information. A great deal of research has confirmed that such attitude strength effects are related to extremity, importance, certainty, and accessibility (Howe & Krosnick, 2017). As Corlett and Marrouch (this volume) argue, it is as though attitudes (and beliefs) are important Bayesian priors such that one new piece of information is not strong enough to alter them.

As a practical point, so that they can document large enough persuasion effects to be statistically detectable, scholars tend to select issues about which message participants have relatively little knowledge, or are *non-attitudes* (Converse, 1970). Studies that have been conducted on high-knowledge topics show greater resistance to persuasion, even to relatively strong arguments (e.g., Johnson & Eagly, 1989). In short, the processes we have listed, which are the factors that bolster motivated reasoning (Principle 15), are probably responsible for this resistance effect.

13. Inoculating Against Future Messages Engenders Resistance

Countering arguments prior to receiving a larger dose of those arguments increases resistance. Sometimes communicators hope to change public attitudes toward a given topic (e.g., with anti-smoking or pro-vaccination campaigns), but other times, efforts are deployed to limit the influence of potentially misleading, persuasive messaging. Inoculation is one such method. McGuire (1961, 1964) proposed that exposing audiences to a "small dose" of a new countermessage and then refuting its arguments can strengthen audiences' original attitudes and beliefs, making them less susceptible to future persuasion efforts to the contrary. Since its inception, inoculation theory has demonstrated effectiveness in increasing resistance to persuasion in a variety of literatures from health and politics to marketing and advertising (see Banas & Rains, 2010; Compton & Pfau, 2016).

14. Sources With Positive Cues Are More Persuasive

Communicators are more persuasive when they possess desired characteristics, or *source cue effects*. Beginning with Hovland and Weiss (1951), researchers repeatedly have found that people will consider communicators credible sources of information when they fulfill two dimensions. First, credible communicators are high on *epistemic* bases such as competence, knowledge, or expertise. In addition, credible communicators are high on *social* bases such as benevolence, motivation, warmth, helpfulness, or trustworthiness (see Fiske, Cuddy, & Glick, 2009; Landrum, Eaves, & Shafto, 2015). Even children as young as 4-years old are able to evaluate communicators on these dimensions (see Mills, 2013). In many cases, the source's social characteristics are perceived to be much more important to credibility assessments and persuasion than his or her epistemic ones (e.g., White, 2005; Landrum, Mills, & Johnston, 2013, McGinnies & Ward, 1980), including audiences' evaluations of similarity between themselves and the sources (e.g., Feldman, 1984). Although a highly credible source is found to be more persuasive than a lesser or non-credible one (see Pornpitakpan, 2004), who is considered to be "credible" can vary based on seemingly irrelevant communicator characteristics. Indeed, audiences can infer expertise and/or trustworthiness based on cues such as celebrity (Erdogan, 1999; Lee & Thorson, 2008; Ohanian, 1991) and/or attractiveness (Patzer, 1983; even if only to a moderate extent: see Eagly, Ashmore, Makhijani, & Longo, 1991; Maddux & Rogers, 1980). These effects appear to be larger when individuals do not have the time, ability, or motivation to consider messages carefully. In such instances, individuals use heuristic and other cues to

evaluate messages (see Johnson et al., this volume). Moreover, as Shavitt (this volume) reviews, the power of social cues depends markedly on the cultural context. People in Eastern, collectivistic cultures are more likely to conform to others than those in Western, individualistic cultures.

15. Attitudes Enable Motivated Reasoning: Selective Exposure, Biased Assimilation, and Boomerang Effects

Nowhere are the phenomena of attitudes more salient than their influence on the interpretation of new information. Attitudes are perceptual, and people form attitudes about a topic even when they lack knowledge about it. Consider people's political positions: Even when voters are uninformed (or under informed) about issues, they still demonstrate strong attitudes toward candidates and policies (see also Stern & Ondish, Volume 2, for discussion on political attitudes). Similar effects emerge regarding science topics: Individuals often display strong attitudes about emerging technologies such as agricultural biotechnology (e.g., Brossard & Nisbet, 2007) and nanotechnology (Scheufele & Lewenstein, 2005) without having much, if any, knowledge about them. Indeed, knowledge is not necessary for forming attitudes.

Motivated reasoning serves attitudes—or is, at least, strongly influenced by them. When engaging in motivated reasoning, our attitudes act as lenses through which we interpret new information (Kunda, 1990), just as Corlett and Marrouch (this volume) describe them as rich Bayesian priors. In general, we consciously and unconsciously seek out information that is congruous with our attitudes and ignore information that challenges them (e.g., selective exposure; Hart et al., 2009). Moreover, when exposed to new information, we often weigh the importance of that information with respect to our attitudes. If the information supports our attitudes, we are less discriminating and likely to assign it more weight (e.g., confirmation bias; Nickerson, 1998); if it contradicts our attitudes, we scrutinize it longer and are likely to ultimately dismiss it (disconfirmation bias; Edwards & Smith, 1996). Unfortunately, these motivated reasoning behaviors can lead to even further attitude polarization, especially when the topic engenders strong attitudes (e.g., Taber & Lodge, 2006). For instance, because Pope Francis' pro-climate messages conflict with many Republicans' skeptical views of climate change, one study found a boomerang effect in which conservatives—who were aware of the Pope's encyclical on environmental issues—reported lower climate change concern after the encyclical's release than before (Li, Hilgard, Scheufele, Winneg, & Jamieson, 2016; also see Landrum, Lull, Akin, Hasell, & Jamieson, 2017). Finally, when a message threatens a perceived freedom, the individual reacts against it in order to reaffirm the freedom, Brehm's (1966) *reactance effect*. Policymakers who censure some activity or good run the risk of making it even more desirable and valuable, especially when people perceive the activity or good as within their rights.

Such motivated reasoning can lead to "science denial," particularly when accepting scientific knowledge would conflict with strong attitudes. For instance, ardent negativity towards vaccinations can lead to misperceptions about vaccines, such as that they are unsafe and/or cause illness (Heininger, 2006). Moreover, when, for example, immigrants or climate change are described as potential causes of an increase in incidences of the Zika virus, existing attitudes towards immigrants and climate change can influence beliefs about Zika's causes and consequences. When climate change is described as a cause of Zika, for instance, people who are skeptical of climate change report being skeptical of Zika's seriousness and disagree with factual information about Zika (e.g., that it causes microcephaly). When immigration is described as a cause of Zika, people who are supportive of immigrants downplay the seriousness of Zika and report skepticism that Zika causes microcephaly (Kahan, Jamieson, Landrum, & Winneg, 2017).

Related, as Earl and Hall (this volume) review, certain types of attitudes can be implicated in the acceptance of conspiracy theories. Negative attitudes towards those who hold positions of power, for example, drive motivations to attribute impractical levels of deceitfulness, corruption,

and immorality to government officials. In turn, these negative attitudes enable conspiracy theories to seem more plausible (e.g., JFK was assassinated by government officials; 9–11 was an "inside job"). As Corlett and Marrouch (this volume) document, neuroscience approaches increasingly reveal powerful impacts of beliefs and attitudes on the processing of stimuli. There is a lay tendency to believe that people process information like a rational scientist, carefully and appropriately weighing evidence and seeking out additional information without emotional involvement. Though we may be capable of doing so, it is not the default. Attitudes drive information processing in a way that is much more automatic, emotional, and colored: Thus, attitudes even color perceptions themselves, so much so that people view an entity as intrinsically good or bad, even though attitudes are only in perceivers' minds, and the perceivers act as though they contribute nothing to these perceptions.

Summary

Clearly, attitudes scholars know very much about the principles documented in this section, yet this summary can only hint at the knowledge present in the larger attitudes literature. Although some principles appear quite simple, for example, that attitudes can be measured, this principle becomes more important when it is realized, with the principles that follow, that attitudes play a strong role in organizing not only intra-psychic life (e.g., motivated reasoning) but also interpersonal, social life (e.g., social cue effects). Attitudes research and theory shows, at its best, that attitudes are part of the fabric of culture and society: In short, without attitudes, humans would not be very human, nor *could* they be very human without possessing and using attitudes.

Lessons From the Field

As much as the chapters in Volume 1 show the very social nature of attitudes, the wide-ranging contexts in which attitudes operate, and the conditions that influence attitudes (Table 16.1), there are still further lessons that emerge from the chapters in Volume 2. In this section, we discuss four main principles that seem quite salient to us: (a) focusing more purely on behavior (but involving attitudes); (b) recognizing that behaviors do often not occur in isolation but instead might be better construed as constellations or lifestyles; (c) social factors such as networks matter more than just individuals alone; and (d) attitudes are critical to the self-regulation process whereby people chose what behaviors to enact.

A Primary Focus on Behavior

Mainly, the work in Volume 1 focuses on theoretical principles, and research supporting these principles generally targets what makes attitudes more negative or positive, stronger or weaker, and not implications for behavior. Attitude-behavior and behavior-attitude research (e.g., habit, cognitive dissonance) stand as important exceptions to these generalizations. When one considers the work in Volume 2, in contrast, a change is clear: *It is behavior that matters most*. For example, even if a large majority agrees that climate change is a serious problem, the problem will not cease unless *actions* to create sustainability also occur. With most applied phenomena, it is not merely the attitudes alone that are important, but how attitudes interact with other factors (e.g., attitudes as a "team player"; Mata et al., Volume 2). For example, the general aggression model (GAM; Bushman & Anderson, 2002), described by Blankenship, Allen, Kane, & Anderson (Volume 2) takes a step back, examining the interaction and influence of environmental, social, personological, and biological factors on aggression (the behavior). Similarly, although laboratories are well suited for examining single acts, it is much more difficult to examine more complex systems, or lifestyles without following people in communities where they live. The chapters in Volume 2 routinely leave the confines of the

laboratory for the "real world," examining attitudes and behaviors that together create a habitual lifestyle that can be studied over months and even years.

Behaviors Are Interrelated

Because lifestyles are composed of multiple elements, including multiple behaviors, they are more complicated than single behaviors (e.g., Albarracín, Wilson, Chan, Durantini, & Sanchez, 2017; K. Wilson et al., 2015). Moreover, in order to change one behavior, people may need to change other facets of their lifestyle: To lower one's risk of acquiring HIV, for example, one may also need to improve his or her mental health (Lennon et al., 2012). To create a healthy lifestyle, individuals may need to lose weight, stop smoking, and exercise more (McDonald, McDonald, Hughes, & Albarracín, 2017). Similarly, interventions used to promote health or other behavioral targets do not necessarily target attitudes, though the changes found may be mediated, at least in part, by changes in attitudes. It is clear that attitudes are still important, but other factors sometimes matter more. Although applied work may at first seem complex, in identifying attitudinal and other influences, this work reveals robust mechanisms and patterns at work. For example, K. Wilson and colleagues' meta-analysis revealed that lifestyle interventions achieved maximal change for moderate- compared to low- or high-difficulty goals; thus, attempting to change to a healthier diet, exercise more, and stop smoking all at once is likely to fail, but doing two of these at once is more likely to succeed.

Networks—Not Just Individuals—Matter

Applied work (Volume 2) addresses real-world problems such as HIV, cancer, obesity, exercise, patient-provider interactions, aggression, and resistance against science. These phenomena would not occur without humans behaving and interacting with individuals and networks of individuals, much as Thomas and Znaniecki's (1918) Polish immigrants adjusted to their new cultures and venues. Take HIV prevention, for example: It is an infection transferred through exchanges of blood and other bodily fluids from individual to individual, in chains of networked links. How did the exchanges take place? Most are through sexual interactions, some through shared needles or blood transfusions, and some through the birth canal. To understand how to prevent HIV, therefore, one needs to understand the behaviors that involve exchanges of bodily fluids between individuals (see Glasman & Scott-Sheldon, Volume 2).

Similarly, from chapters in Volume 2, we learn that, for example, being linked to others who are overweight or obese tends to promote weight gain (Mata et al.); being linked to sedentary others reduces exercise (Hagger); and adolescents who are linked to peers who do drugs are more likely to do drugs themselves, especially if they are close friends (White et al.). Of course, other people influence individuals to act in a fashion in which they do not intend to act through acts of coercion or social influence; when an individual has a high degree of social or other power, the reverse is true, and single individuals can influence potentially many other people (cf. Latané, 1981; Pratto et al., 2011): There is a reason that celebrities are routinely tapped to peddle commercial products (see Rucker & He, Volume 2) and that newscasters can unintentionally affect political races (Stern & Ondish, Volume 2). Moreover, it is important to recognize that individuals can act for their "tribes" as much as for themselves, as Blankenship et al. (Volume 2) documented in relation to human aggression and as Dovidio, Schelhass, and Pearson (Volume 2) reviewed in terms of intergroup relations.

Attitudes Are Central to Self-Regulation

Self-regulation is the ability to monitor and control one's behavior, emotions, or thoughts and to alter them as necessary for the demands of the situation. To self-regulate means that one has a target for

one's behavior, emotions, or thoughts, and to monitor and control them as necessary for the demands of the situation. Imagine a perfect reality in which individuals would possess positive attitudes about behaviors that will help them remain nourished, safe, healthy, even while promoting others' welfare (e.g., sustainability, not over-using scarce resources, treating all others with respect); and they would possess negative attitudes toward behaviors that are the reverse. In this perfect reality, self-regulation would be a breeze: Just do what you like and all is well and will be well into perpetuity.

The chapters in Volume 2 offer evidence for and against this view of reality. Or, better put, attitudes often *do* enable such healthy lifestyles, but they also cause problems. For example, possessing positive attitudes toward exercise is indeed connected to better physical and mental health as well as longer lives (Hagger). The problem, of course, the inverse is also true: Those who dislike exercise invite poorer mental and physical health, and often die sooner. We suspect the same is true in all of the other chapters in Volume 2, although with complexities: (a) Those who act impulsively in risky sexual situations invite HIV or other sexually transmitted infections (Glasman & Scott-Sheldon); (b) people will follow their positive attitudes toward sweet foods and overeat into obesity (Mata et al.); (c) because of the perception that sun-kissed skin looks more desirable, people will increase their risk of skin cancer by tanning (Sweeny et al.); (d) those who hold negative attitudes toward racial minorities must avoid acting on them interpersonally (Dovidio et al.; Esses et al.); and (e) may in fact unintentionally cause harm because of their attitudes toward stigmatized groups (Penner et al.). Indeed (f), many people deliberately aggress based on their negative attitudes toward outgroup and/or stigmatized targets (Blankenship et al.). Moreover (g), as much as people claim they want to act to conserve the environment, few succeed 100% (Milfont & Shulz). Vacation travel contributes greenhouse gases to the atmosphere and hotels commonly over-use water supplies (Gärling, Bamberg, & Friman). (h) Even more remarkably, people often get themselves in trouble even though they know better: Many cigarette smokers, for example, like smoking to counter stress even while also knowing that the habit kills (White et al.). In the end, we must conclude that people's attitudes get themselves in trouble all too frequently. We return to the issue of attitudes and self-regulation in the next section.

Challenges for the Future of Attitude Research

In this section, we discuss several salient challenges for attitude research that emerge from the foregoing material, including a focus on the replicability of attitude phenomena, understanding the circumstances under which implicit attitudes relate to behavior, and understanding the role that attitudes play in individuals' efforts to self-regulate their own behaviors. As we will discuss, another challenge stems from the recently developed taxonomy of behavior change techniques, which theoretical attitudinal research has to date ignored. In our view, as well, attitudes scholars also need to understand better how attitudes spread through individuals and networks. We also need a better understanding how developmental considerations relate to attitudes and attitudinal processes.

The Replicability of Attitude Phenomena

The chapters in this *Handbook* have told numerous stories of successful scientific practice in process, from rich conceptualizations to methodological innovations to initial discoveries and even, in many cases, to replications of those initial discoveries (Table 16.1). Over time, theories become more complex to accommodate deviant observations, and methods gradually improve precision and validity. Recent years have seen a surge of critical research and position statements regarding the replicability of research (cf. Open Science Collaboration, 2015; Stroebe & Strack, 2014), and these are serious considerations. Even so, we note that past periods of incredulity regarding

science have successfully resolved, reaffirming and usually better understanding the phenomena in question. For example, by the 1970s and 1980s, several prominent areas of attitude research experienced their own "replicability crises"; yet, in each case, through the scientific process, the area recovered with great aplomb. As Eagly's (1992) review documented, progress in areas of attitudes research, as in science more broadly, can at times be uneven. She noted a pattern for research to show more complex patterns than initial theories predicted and then to succeed better. In attitude-behavior relations, for example, an early and rudimentary research synthesis found weak support ($r \approx .15$) for the principle that attitudes relate to behavior (Wicker, 1969). Numerous scholars struggled with this mass of data, some continuing to improve an understanding of how attitudes toward targets may relate to behaviors (e.g., Fazio, 1986). Others refined what it meant to study attitudes toward behaviors. Most prominently, Fishbein and Ajzen (1975; Ajzen & Fishbein, 1977) developed more rigorous measures for attitudes and behaviors (especially, multiple-act criteria; compatible measures) and then crucial theory, first the theory of reasoned action and then the TPB (Ajzen et al., this volume).

It is a triumph for the field of attitudes that these theories are so popularly applied, even if they often seem somewhat blasé in scientific fields that identify so closely with theory *per se*, such as social psychology; in short, the TPB is one of social psychology's most influential theories not because social psychologists have advanced it but because scholars in other fields have so frequently applied it (Montaño & Kasprzyk, 2015). Such is the need to predict and understand practically any sort of behavior under the sun. Work on attitude-behavior relations is an interesting example and helps to highlight some important principles about research. Research in this area usually has fairly large samples; there are also large numbers of such studies across numerous domains. Consequently, statistical power is accordingly relatively high to detect associations and moderation patterns. In contrast, experimental research—the hallmark of fields such as social psychology and health psychology—tends to rest on much smaller samples, with the consequence of lowered power and the greater probability of false-positive findings (e.g., Fraley & Vazire, 2014). In pooling smaller studies, meta-analysis to some extent mitigates this problem, but the routine finding that there is unexplained heterogeneity after fitting models implies that not all factors are in the model, whether conceptual or methodological (Johnson & Eagly, 2014). Of course, relative to even prospective correlational studies, experimental studies may be much more resource-intensive to conduct, which often necessitates smaller samples. Thus, one solution to the problem is a matter of institutional policy: increasing the priority of providing grant funds so that studies can be sufficiently powered.

The Challenge of Implicit Attitudes and Behavior

Conspicuously absent from the principles in Table 16.1 is a statement that implicit attitudes relate to behavior. Although implicit attitudes clearly *can* be measured, the research examining the correspondence between implicit attitudes and behavior, unfortunately, has been more uneven than has been the case for explicit attitudes and behavior (Ajzen et al., this volume; Gawronski & Brannon, this volume; Krosnick et al., this volume). Ajzen and colleagues document that meta-analyses of this literature have shown a small, or even very small, average correlation between implicit attitudes and behaviors (e.g., rs = .12 to .24). Moreover, the correlations across studies are diverse, so that some studies obtain substantial correlations and others none at all, with coded features of the studies accounting for little of this heterogeneity.[2] As Ajzen et al. and Gawronski and Brannon note, correlations are probably larger in reality, but behavioral measures in studies need to use multiple-act criteria to see it, so that a general attitude is linked to a behavior defined at a similar level of compatibility. Critically, implicit measures have correlated nontrivially with spontaneous behaviors such as nonverbal expressions, which presumably are under lesser conscious control. Penner et al. (Volume 2) review an important literature focused on patient-provider interactions and document

that White physicians' implicit attitudes toward non-White patients often predict both their nonverbal behaviors and the medical treatment they provide these patients. Such findings are highly important because they derived from interactions in which lives may be at stake, such as interactions between oncologists and their cancer patients. The results indicate that doctors with more negative implicit attitudes are treating their minority patients suboptimally compared to doctors with more positive attitudes (and compared to patients who share their race). Collectively, these patterns suggest that implicit attitudes are a genuine phenomenon. Nonetheless, future work should attempt to resolve why study results are so divergent, why attitude-behavior linkages are robust in some areas but not others. Moreover, it would be valuable for studies to pit implicit against explicit attitudes, to see whether one provides an advantage over the other in terms of unique variance explained. The implication of work in this domain is that people are acting more in accordance with their unconscious or automatic desires than they are in their deliberate intentions.

Attitudes, Meet Self-Regulation; Self-Regulation, Meet Attitudes

As we noted, attitudes can either facilitate self-regulation or impair it; yet, aside from work on the "intention-behavior gap" and implementation intentions (e.g., Ajzen et al., this volume; Albarracín et al., this volume), attitudes scholars generally have not focused their research on self-regulation *per se* (check the subject index, and you can see for yourself). In fact, the reverse is also true: Although self-regulation is a vast literature, it seems as though scholars in this area have yet to discover attitudes. A recent handbook on the subject barely mentions attitude or evaluations (Vohs & Baumeister, 2016): One of its chapters *does* address desire and self-regulation (Hofmann & Vohs, 2016), pointing out that desires are relevant to self-regulation as they have affective, cognitive, and motivational aspects. Yet, it still does not cite any attitudinal literature. A recent *Annual Review* article provocatively titled, "In search of a human self-regulation system" (Kelley, Wagner, & Heatherton, 2015), also mentions neither attitude nor evaluation. This source is intriguing because it documents numerous trends from neuroimaging studies, and a closer look implicates attitudes: The review frequently uses words such as "desire," "reward," and "reward evaluator," even without citations to classic and contemporary attitudes work. Desire, reward, and reward evaluator processes are clearly attitudinal and resonate with early work on learning and memory. This work is a reminder that attitudinal systems involve some of the most primitive circuitry in the brain, over millions and even billions of years having helped our ancient ancestors approach resources that aid survival and avoid death (e.g., Goleman, 1995; E. O. Wilson, 2012). It is also a reminder that species other than humans possess attitudes.

Although attitudes and self-regulation work appears to have little contemporary overlap, at least we can confidently assert that Corlett and Marrouch (this volume) have done the field of attitudes a great service by showing how these literatures converge: Attitudes and beliefs truly "live" in frequently activated circuits of subsystems in the brain. Now, work in both attitudes and self-regulation areas can converge. A high priority ought to be examining the intention-behavior gap from a neuroimaging approach: Which regions and systems of the brain are implicated when someone who intends to act in a certain fashion fails to do so? Another priority ought to be explaining the negative effects of attitudes we previously listed, which presumably instantiations of short-term needs and desires overwhelm long-term needs and goals. Presumably, if work on the neuroscience of self-regulation holds sway (Kelley et al., 2015), signals to the reward centers of the brain short-circuit the better wishes generally centered in the prefrontal cortex, commonly associated with executive function. It would appear that the self-regulation failures are instances of automatic systems—*System 1*, in Kahneman and Frederick's (2002) rubric, short-circuiting *System 2*, which is the deliberative system (see Bargh & Ferguson, 2000). Those who know that eating a hot fudge sundae will make their problems worse can still find themselves eating one.

Interestingly, at least two prominent self-regulation theories have approached the subject from an attitudes perspective. First, Bagozzi's (1992) theory of trying recognizes that people evaluate the emotional significance of events and needs; it incorporates many of the same elements of the TPB, but instead of targeting actions (e.g., attitude toward the action), it targets people's attitudes toward success along with the chances of success, attitudes toward failure along with the chances of failure, attitudes toward trying to perform the behavior, along with subjective norm toward trying. Each of these elements predicts intention to try, which in turn leads to trying. It also posits that frequency of past trying increases the likelihood of intending to try as well as trying, as well as the recency of trying. The fact that past behaviors so frequently predict future behaviors might well be taken as evidence for these latter two points; work in neuroscience shows that repeated behaviors pave neural pathways, making them more likely to be used (Corlett & Marrouch, this volume). The evidence regarding the attitudinal and subjective norm components of the theory has not been integrated, even though the theory of trying has been quite influential. That said, meta-analysts have found broader support for the role of identity as an important factor in predicting behavior. For example, Rhodes, Kaushal, and Quinlan (2016) found that those who identify as someone who is physically active exercise more than those who lack this identity. These factors make approaches like Bagozzi's an interesting prospect for future work. It is a fact that people hold attitudes toward different behaviors that are not necessarily logically coherent (Fabrigar et al., this volume). Presumably, situational cues and varying needs determine when each drives behavior—and overwhelms an intention to act otherwise, similar to the auto-motives theoretical perspective (Bargh & Ferguson, 2000).

Another self-regulation perspective that has incorporated attitudinal elements is the common sense model of self-regulation (Leventhal, Diefenbach, & Leventhal, 1992), which includes behavioral beliefs, treatment beliefs, and intentions as predictors of problem-focused coping, and involves enacting behaviors to improve some aspect of health, such as using sunscreen to prevent sunburn. Interestingly, Hagger, Koch, Chatzisarantis, and Orbell's (2017) recent meta-analysis of this large literature did not link these attitudinal variables to emotion-focused coping, which involves enacting behaviors to avoid the threat, to vent emotions, and the like, which suggests that these are automatic System 1 outcomes. Although it is logical that attitudes operate as this model specifies they do, it is intriguing to see that, even in this perspective, we still see an effect by which people deny longer-term realities in favor of a more-preferred short-term realities.

There are some other basic reasons why self-regulation and attitudes variables should be the focus of new scholarship. From the attitudes domain, as we noted above, we see that people continually find themselves in habits that are suboptimal for themselves or for others, resulting in intention-behavior gaps. The monitoring and control aspects of self-regulation are presumably largely conscious (Kelley et al., 2015) and also are metacognitive. In addition, the process is evaluative, because the monitoring aspect involves evaluation, such as "Am I meeting my goal?" If so, it implies a positive attitude toward the activity; if not, it's a negative attitude. Successful self-regulation, therefore, can become self-reinforcing and introduce a new habit; we suggest that this feedback loop would be more marked when it concerns behavior than when it concerns self-regulation of emotions or thoughts, because it would engage habit-related processes (Table 16.1, principle 5). Self-regulation occurs in relation to mundane activities (e.g., brushing one's teeth) or extremely important events (performing a musical piece in a recital). Performing well at the important events is a highly desired outcome—which itself implies an attitude and therefore something that itself motivates increased self-regulation (e.g., practice). In turn, the attitudes can pack self-regulation episodes with emotion. Failure could mean sadness or despair, success glee and happiness. Similarly, some self-regulation episodes may be important, but the short-term activity in question may not be pleasurable (e.g., physical therapy, practicing a difficult musical piece). For example, attitude toward trying, as Bagozzi (1992) conceptualized it, seems strongly linked to self-regulation efforts: In such instances, it would seem logical to predict that actors will succeed better to the extent that they desire the long-term

goal in question (full recovery, high-level musical skill). In other words, the higher a person values a delayed reward (recovery, an impressive performance), the more self-regulation is involved. Conversely, discounting delayed rewards ought to increase behavioral problems and issues with self-regulation. Clearly, much is to be gained if self-regulation and attitudes scholars join forces.

Motivated Reasoning More Broadly Construed

As we reviewed above, motivated reasoning occurs to support attitudes. So profound is this problem that it remains a challenge to understand how to stop motivated reasoning gone awry. For example, how do we prevent people from denying the truth in relation to climate change? How hot and tumultuous will our climate get before there is a critical mass of public support for policies to control or reverse it? How do we convince anti-vaxxers about the individual- and community-health value of vaccinations? One conclusion that seems clear is that addressing the denial directly is an invitation for reactance; thus, we should not routinely expect that those whose attitudes are based on false beliefs will allow the evidence to change their minds. The best hopes we can identify are two: First (a), there is Hornsey and Fielding's (2017) indirect approach focused on science denialism. In essence, this approach attempts to identify the motivational roots of deniers' attitudes and then tailor messages to work with (instead of against) these motives. Consistent with Briñol and Petty's (this volume) and with Stern and Ondish's (Volume 2) reviews, Hornsey and Fielding suggest that the first step is to identify which of several broad motives an audience holds for denialist positions (e.g., system justification) or which specific motives (e.g., vested interests) support them. Then, tailor a message that aligns with the belief or motive, such as "being proenvironmental allows us to protect and preserve the American way of life," which serves a system justification value (see also Landrum & Lull, 2017). Hornsey and Fielding label their approach as *jiu jitsu* because it harnesses and redirects the target's existing motives in favor of a different goal. As these scholars note, several studies have supported their approach at least indirectly, but more work in this area is needed. For example, it would seem that the more motives that a target holds, whether broad or specific, the more difficult it would be to craft persuasive arguments; moreover, such targets would presumably have extremely strong attitudes. Similarly, particular arguments that address one motive may boomerang in relation to another motive. We suspect that *image transportation*—which is clever messaging or the use of images or words that evoke desired end states—works in this jiu jitsu fashion (see Green & Brock, 2000). The second strategy (b) for overcoming resistance is through self-affirmation, an approach that Claude Steele (e.g., 1988) pioneered and that targets people's basic need to maintain self-integrity or a global sense of personal adequacy. As Harmon-Jones et al. (this volume) and Earl and Hall (this volume) review, threats to the self—such as counterattitudinal information—may be lowered when one affirms values or attitudes on a broader plane. Thus, providing general reassurance to a target that he is "a good person" or even "good enough" is sufficient to create a more open-minded approach to otherwise challenging information. As Cohen and Sherman's (2014) review documented, such effects also can be fairly long lasting (e.g., one month later). Moreover, self-affirmation has seen fairly broad application to health-related topics, as Sweeney and Moyer's (2015) recent meta-analysis also documented: People's self-affirmation consistently improved people's intentions to behave healthier.

Behavior Change Techniques

As Johnson et al. (this volume) review, when direct efforts to persuade are feasible (e.g., when attitudes are being formed), the literature offers the advice to motivate the targets to think carefully about the issue (viz. accuracy motivation) and to have an attractive, credible source offer them arguments that their peers have already judged to be persuasive (viz. strong arguments); it also would not

hurt to put them in a good mood beforehand (though that might lower accuracy motivation). Yet, in recent years it has become clear that there are far more behavior change techniques (BCTs) than these: Michie and colleagues (2013) identified 93 BCTs that have been evaluated across intervention research, structured them hierarchically into 16 conceptually similar clusters within a taxonomy, and determined that trained judges can distinguish between the individual BCTs. As examples, the BCT taxonomy's 13th cluster, "Comparison of Outcomes," includes "persuasive argument" along with the BCTs "pros and cons" and "comparative imagining of future outcomes." Similarly, their 14th cluster, "Identity" focuses on identification of self as role model, self-affirmation, identity associated with changed behavior, reframing, and cognitive dissonance. Along with other clusters of BCTs and individual BCTs, clearly, these are the stock of attitudes experts and deserve close attention. This work represents increasingly strong science, yet it has made little appearance into basic attitude work as yet, even while applied scientists have quickly embraced BCTs. On the practical side, the taxonomy offers the potential for better reporting of behavior change interventions, both in terms of experimental and control arms, which ought to improve future meta-analyses' abilities to explain discordant study findings (Johnson, Michie, & Snyder, 2014).

Importantly, when interventionists attempt to change behavior, it is usually *not* to formal persuasion models that they turn. Davis, Campbell, Hildon, Hobbs, and Michie (2015) conducted a scoping review of theories used in efforts to change health behavior, identifying theories both through literature search and through expert consultation, using experts from sociology, anthropology, economics, psychology, health services, epidemiologists, and health policy. Although 82 theories were identified in 276 relevant sources, those most used were broad theories of behavior and behavior change: the transtheoretical model (Prochaska, & Velicer, 1997), the TPB or the theory of reasoned action, and social cognitive theory (Bandura, 1991); another, the information-motivation-behavioral (IMB) skills model (Fisher & Fisher, 1992) was developed for HIV prevention and then generalized to other risk behaviors. A challenge for attitude scholars into the future is to show that their models improve an understanding of persuasion over and above these more general frameworks.

The Importance of Networks—and of Attitudes to Networks

As we remarked, the chapters in Volume 2 of this *Handbook* have documented that networks have a reality beyond the individual. Unfortunately, theories that focus only on individuals can only indirectly gauge social influences, which restricts their ability to explain behavior. Although prominent, general theories of behavior each attempt to incorporate the influence of others for an individual's behavior, they do so indirectly (Johnson et al., 2010). The TPB (Ajzen, 1991) considers social norms; the social cognitive model (Bandura, 1991) considers other people as obstacles to manage; and the self-determination model (Deci & Ryan, 2002) considers that other people may interfere with attempts to gain autonomy.[3] Each of these theories views the influence of other people as judged by the target individual; while these influences have been demonstrated to have some import for behavior (e.g., Ajzen et al., this volume), this influence is decidedly indirect, consistent with Johnson et al.'s (2010) critique of individual-level theories. A challenge for future attitude research is to incorporate objective ties linked to individuals. Such an approach offers potentially great insights into behavior. For example, social influence scholars have theorized that one reason that attitudes may appear "strong" is that individuals are linked to important others whose attitudes are also strong (e.g., Latané, 1981; Sherif et al., 1965). An individual may be persuaded by an influence attempt yet be left in an untenable position: Attitude and behavior change will be unlikely or impossible without first persuading the linked others that a new direction is better. A smoker convinced he must quit will have an easier time if he also convinces his wife, father, and close friends, smokers all, to quit as well. Table 16.1's Principle 9, that public endorsements generate more positive attitudes, is a testimony to the power that role playing has to change (first) behavior and (then) attitudes.[4]

On their own, attitudes seem to operate on a micro level—that is, they are mental elements that individuals use to navigate through their realities—yet it is worth noting that social comparison processes interface with attitudinal principles (Burnstein & Vinokur, 1977). For example, deviance regulation theory (Blanton & Christie, 2003) posits that people select desirable ways to deviate from social norms and avoid undesirable ways of deviating from social norms. In selecting what is "desirable" or "undesirable," people must rely on their attitudes, coupled with a knowledge of what is popular in the context. Note also (a) that attitudes and beliefs now interface with moral considerations; that is, they broadly are influenced by decisions of right and wrong. In addition (b), deviance regulation uses attitudes in a self-regulatory effort.

Social network ties also provide an objective link between micro and macro levels: Attitudes and actions at the individual level can influence networked others and ripple outwards, although as we implied, it is typically only powerful individuals who do so. These interactions highlight that social influence in networks can be highly reciprocal: Depending on the strength of the network ties, one affects others, and vice versa. Members of one network can bridge to another one (e.g., interethnic networks) or bond with each other within networks (e.g., intraethnic networks). One provides a needed resource to the other in mutual exchanges, whether informal or informal. A baby rewards her mother with gazes from her large eyes; the mother rewards the baby with her own gaze, by providing warmth, protection, and sustenance. A member of a popular social network helps the network survive by following advertisements posted there; the network benefits the member by providing a service (e.g., organizing information about social ties). Hence, networks exist because individuals like or otherwise value the networks and in turn act in such a way as to sustain the network (see Johnson et al., 2010). When these reciprocal exchanges cease, the networks also cease, and individuals are forced to seek other networks to fulfill their needs. Similarly, objective network links may matter as well in the sense of policies that important institutions invoke; institutions, of course, are in turn organized networks of individuals but can bring concerted resources to bear on a problem.

Attitudes and Development

Note that many of Table 16.1's principles are statements about how attitudes and related concepts interact over time, that is as mental developments. Yet, with few exceptions, attitude theorists seldom think of these concepts through a developmental lens. The studies conducted by the Volume 2 authors more often sample from the general population, and there we see important developmental implications, such as the need to start healthy exercise and nutrition habits from a very young age (Mata et al.). One exception is Gerrard, Gibbons, Houlihan, Stock, and Pomery's (2008) prototype willingness model for risk behavior change in adolescents. This model takes as its inspiration the behavioral approach system, which, as noted distinguishes between System 1 (e.g., holistic, impulsive, intuitive) and 2 (e.g., rational, analytic, controlled) processes. Gerrard and colleagues point out that adolescents are more System-1 driven than are adults. Specifically, (a) early adolescents experience increased reward-seeking especially in the face of their peers; (b) adolescents steadily gain self-regulation skills and (c) intellectual ability into their mid-20s (Steinberg, 2008). And (d), in parallel, adolescents have lower emotional intelligence than adults (e.g., Mayer, Caruso, & Salovey, 1999). Accordingly, Gerrard et al. focused on System 1 in constructing their model. In addition to TPB concepts of attitudes, norms, and intentions, Gerrard et al. added risk images and behavioral willingness. *Risk images* are cognitive representations of the sort of person who acts in a certain way (e.g., a smoker); *behavioral willingness* refers to the degree to which the actor can accept the social consequences associated with the behavior (e.g., as someone who smokes). Todd, Kothe, Mullan, and Monds' (2014) recent meta-analysis shows reasonable support for the predictive validity of these linkages. Similarly, many alcohol interventions for adolescents incorporate a normative feedback component, such as asking youth what they think others drink and then show them the normative

level of drinking in their community (which is typically much lower), which lowers alcohol-related problems, as a recent meta-analysis showed (Tanner-Smith & Lipsey, 2015). Thus, Gerrard et al.'s model illustrates the importance of thinking about lifespan development in relation to behaviors and behavior change. Of course, other points in the lifespan are associated with different principles as well. Each principle may hold implications that attitudes scholars can and should utilize in the next generation of attitude theories and research. A challenge for future attitudes work is to increase ties to the developmental literature.

Closing Thoughts on Attitudes in the 21st Century

As this chapter has documented, attitudes research has identified robust principles (Table 16.1): Attitudes scholarship has grown a great deal in its first century of research on this subject, and there is much hope for the new century of attitudes research that now commences. The knowledge gains that have accrued derive not only from what is known as basic science but also, as has been a dominate theme of this chapter, from applied science. It is interesting that some fields, like social psychology or physics, have historically privileged theory over application. In contrast, other fields, such as health psychology, organizational psychology, accounting, and advertising have generally privileged application over theory, including many of the subjects covered in chapters in Volume 2 of this *Handbook*, which document numerous practical issues for which attitude theories and measures have been fruitfully applied. Historically, many of these domains have been considered *applied*, such as early researchers who focused on prejudice and intergroup relations: Prejudice is, after all, an attitude, and intergroup relations deals with real-world groups that have certain experiences with each other. Yet, as these areas have matured they developed theories of their own. As Dovidio, Schellhass, and Pearson (Volume 2) document, for example, prejudice and intergroup relations scholars discovered phenomena that extant attitude theories could not explain, such as subcategorization, in which prejudice against an outgroup persists even after befriending (liking) members of this group. These examples help to show that clash between basic and applied science is a false dichotomy, as Stokes (2007) persuasively argued: No matter how theoretical the basic scientist, data collection efforts mean that there is an applied angle, however narrow. Stokes gives the example of physicist Niels Bohr who modeled atomic structure as a "pure voyage of discovery" (p. 73), that is, as purely basic. Yet, in the decades following, other scientists used his principles to give society reliable computers and smartphones, among other applications. In fact, science can be both basic and applied at the same time. Indeed, we believe that that applied research coupled with theory is where the best value is, both for science and for the good of humankind. The science is better because it uses emerging theoretical principles that are more refined than older frameworks can possibly be and promises improvements in understanding the phenomenon, and consequently, better hope for controlling and capitalizing on the phenomenon, which in turn is better for society. This line of reasoning leaves an ironic conclusion: Attitudes scholars should privilege not only basic research but also theory-informed research on important real-world problems such as sustainability, poor health, or prejudice and discrimination. In short, to borrow a phrase from the late Martin Fishbein, applications to the real world are "where the action is."

Notes

1 Of course, Corlett and Marrouch (this volume) also make clear that attitudes are contained in the interactions of multiple systems inside the brain; it is not that attitudes "live" in the amygdala, say, and are not elsewhere. For example, beliefs are more likely to be stored in the neocortex.

2 Worse still, in some cases, independent investigators have reanalyzed data in published reports and found them to have anomalies that lower or zero-out initially obtained correlations (see Oswald, Mitchell, Blanton, Jaccard, & Tetlock, 2013).

3 Note that only the TPB directly includes an attitude construct, although the other two are congenial to belief concepts.
4 Whereas the chapters in this volume offer extensive coverage of role playing, this subject is strangely absent from Volume 2. Role playing is a stock skills-building procedure of cognitive behavioral therapy (e.g., Cusack et al., 2016; O'Farrell, 2015). It would seem that attitudinal scholars who are focusing on real-world problems might profit from considering this strategy.

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