Cognitive Consistency in Social Cognition

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The desire to maintain consistency between cognitions has been recognized by many psychologists as an important human motive. Research on this topic has been highly influential in a variety of areas of social cognition, including attitudes, person perception, prejudice and stereotyping, and self-evaluation. In his seminal work on cognitive dissonance, Leon Festinger noted that inconsistencies between cognitions result in negative affect. Further, he argued that the motivation to maintain consistency is a basic motive that is intrinsically important. Subsequent theorists posed revisions to Festinger's original theory, suggesting that consistency is only important to the extent that it allows one to maintain a desired self-view or to communicate traits to others. According to these theorists, the motivation to maintain consistency serves as a means toward a superordinate motive, not as an end in itself. Building on this argument, more recent perspectives suggest that consistency is important for the execution of context-appropriate action and the acquisition and validation of knowledge.

Several important lines of research grew out of the idea that cognitive consistency plays a central role in social information processing. One dominant line of research has aimed toward understanding how people deal with inconsistencies between their attitudes and their behaviors. Other research has investigated how individuals maintain their beliefs either by (1) avoiding exposure to contradictory information or (2) engaging in cognitive processes aimed towards reconciling an inconsistency after being exposed to contradictory information. Cognitive consistency perspectives have also been leveraged to understand (1) the conditions under which explicit and implicit evaluations correlate with one another, (2) when change in one type of evaluation correspond with change in the other, and (3) the roles of distinct types of consistency principles underlying explicit and implicit evaluations.

Expanding on these works, newer lines of research have provided important revisions and extensions to early research on cognitive consistency, focusing on (1) the identification of inconsistency, (2) the elicitation of negative affect in response to inconsistency, and (3) behavioral responses aimed to restore inconsistency or mitigate the negative feelings arising from inconsistency. For example, some research has suggested that, instead of following the rules of formal logic, perceptions of (in)consistency are driven by "psycho-logic" in that individuals may perceive inconsistency when there is logical consistency, and vice versa. Further, reconciling conflicting research on the affective responses to inconsistency, recent work suggests that all inconsistencies first elicit negative affect, but immediate affective reactions may change in line with the hedonic experience of the event when an individual has time to make sense of the inconsistency. Finally, new frameworks have been proposed to unite a broad range of phenomena under one, unifying umbrella, using the concept of cognitive consistency as a common denominator.

Keywords: cognitive consistency, social cognition, dissonance, motivation, attitudes

The desire to maintain consistency between cognitions has been recognized by many psychologists as an important human motive. Research on this topic has been particularly influential in many of areas of social cognition, including attitudes, person perception, prejudice and stereotyping, and self-evaluation (see Gawronski & Strack, 2012). Beginning with Festinger's (1957) dissonance theory, research on cognitive consistency has evolved in response to debates surrounding the exact function of the motivation for cognitive consistency and the conditions necessary for aversive feelings of dissonance to be elicited by inconsistency. Throughout this evolution, several major themes have emerged and new lines of research continue to refine and challenge our understanding of the processes underlying the maintenance of cognitive consistency. In this chapter, we briefly review these theoretical debates and dominant lines of research, highlighting the ways in which research on cognitive consistency has influenced the field of social cognition.

Early Research on Cognitive Consistency

Two early theories have dominated the discussion of cognitive consistency in social psychology: Festinger's (1957) dissonance theory and Heider's (1958) balance theory. In 1954, Leon Festinger and his colleagues infiltrated a doomsday cult to study how the individuals comprising this group would react to their beliefs being disconfirmed (Festinger, Riecken, & Schachter, 1956). The members of this group believed that the end of the world was near. As the date of prophecy passed, Festinger and his colleagues found the group become even more certain of and committed to their beliefs than before. Following these observations, Festinger formulated his theory of cognitive dissonance (Festinger, 1957) to explain the ways in which individuals might deal with conflicting cognitions. When two cognitions are at odds, he suggested, an individual feels anxious and attempts to deal with the inconsistency through various means, such as ignoring conflicting information or adding cognitions that can reconcile the conflict.

Fritz Heider, a contemporary of Festinger, similarly proposed a theory explaining how evaluations of other people might form and change. Heider (1958) suggested that people strive to maintain balance, or consistency, within their cognitive systems such that all evaluative relations result in a positive product. For example, if Jane likes Brooke (+) and Brooke likes Catherine (+), then Jane will also like Catherine (+), resulting in a positive product of the three relations. To the extent that the product of three triadic relations is positive, the system is balanced and will not be pressured to change.

Chapter to appear in: M. Hogg (Ed.), *The Oxford encyclopedia of social psychology*. New York, NY: Oxford University Press.

Conversely, if the product of three triadic relations is negative (e.g., Jane likes Brooke, Brooke likes Catherine, but Jane dislikes Catherine) the system is imbalanced and will be pressured towards change. Heider (1958) suggested that imbalance could be remedied in two ways. First, changes in evaluations could arise (e.g., Jane starts to dislike Brooke or Jane starts to like Catherine). Second, changes in perceived evaluative relations could occur (e.g., Jane breaks the positive connection between Brooke and Catherine by reasoning that Brooke expresses positivity towards Catherine only because of social pressures).

What Is (In)consistency?

Festinger (1957) provided a formal definition of inconsistency, stating that "*x* and *y* are dissonant if not-*x* follows from *y*" (p. 13). To the extent that one cognition logically implicates the opposite of another cognition, those cognitions are inconsistent with one another, which gives rise to aversive feelings of dissonance. An important aspect of Festinger's theory is its emphasis on the subjective nature of dissonance, suggesting that factors such as personal importance moderate the magnitude of dissonance that is elicited by inconsistent cognitions.

Conceptually, cognitive (in)consistency is distinguished from processing (dis)fluency, although the two are often conflated (Gawronski & Brannon, in press). Whereas processing fluency refers to the ease with which information can be processed (see Alter & Oppenheimer, 2009), (in)consistency concerns the actual content of the information. Despite this difference, consistency and fluency can mutually influence each other, such that new information that is inconsistent with one's beliefs is usually more difficult to process than belief-consistent information (see Sherman, Lee, Bessenoff, & Frost, 1998). Conversely, enhanced processing fluency can hinder the detection of inconsistencies in the contents of information (see Winkielman, Huber, Kavanagh, & Schwarz, 2012). For example, in one study, participants were asked to answer trivia questions such as *How many animals of each kind did Moses take on the ark?* in either an easy-to-read font (i.e., fluent processing condition) or a hard-to-read font (i.e., disfluent processing condition). Participants who read the trivia questions in an easy-to-read font were less likely to detect inconsistencies in the questions (Moses appears in the biblical story of the Ten Commandments, not the story of the great flood) than participants who read the trivia questions in a hard-to-read font (Song & Schwarz, 2008).

Another concept that is closely related to cognitive (in)consistency is attitudinal ambivalence. Ambivalence occurs when an individual holds opposing attitudes towards the same object (van Harreveld, van der Pligt, & de Liver, 2009). For example, if someone loves chocolate cake for its delicious taste and, at the same time, despises chocolate cake for its high calories, their attitude towards chocolate cake is ambivalent in the sense that it is both positive and negative. Ambivalence is closely related to cognitive inconsistency in that it involves a conflict between two or more cognitions. Ambivalence also produces many of the same outcomes as inconsistency, including aversive feelings and biased information processing (for a review, see van Harreveld, Schneider, Nohlen, & van der Pligt, 2012). However, ambivalence is different from cognitive inconsistency in that ambivalence can be rooted in cognitions that are not necessarily inconsistent. For example, although there is no inconsistency between the cognitions *chocolate cake is delicious* and *chocolate cake has high calories*, the two cognitions can lead to ambivalence by giving rise to opposing attitudes toward chocolate cake.

Why Is (In)consistency Important?

Since Festinger's (1957) seminal theory, there have been ongoing debates surrounding the function of the motivation to maintain cognitive consistency. Festinger originally argued that the motivation to maintain consistency was a fundamental human motive, which serves as "a motivating factor in its own right" (p. 3). However, in the intervening years, several revisions have qualified this argument by specifying the conditions under which the motivation to maintain consistency arises.

Negative Arousal

A central tenet of Festinger's (1957) original theory was that inconsistent cognitions elicit aversive feelings of arousal (i.e., dissonance), which were assumed to function as the primary driver of behaviors aimed toward resolving inconsistency. Subsequent research provided evidence for this claim by directly and indirectly monitoring negative arousal in response to inconsistencies and during their resolution. For example, Zanna and Cooper (1974) found that participants exhibited inconsistency-reducing behavior (i.e., attitude change) only when they attributed their state of negative arousal to its underlying inconsistency. In contrast, participants who misattributed inconsistency-related arousal to a placebo pill did not engage in behaviors aimed toward resolving inconsistencies. These results suggest that negative arousal indeed plays a central role in the motivation to maintain cognitive consistency (cf. Bem, 1972), and this conclusion has been supported by research using direct measures of arousal (i.e., skin conductance; Croyle & Cooper, 1983) and self-reported discomfort (Elliot & Devine, 1994). Expanding on these findings, Losch and Cacioppo (1990) provided more nuanced insights into the affective underpinnings of inconsistency resolution. These researchers found inconsistency-reducing behaviors only when

inconsistency-related arousal was perceived negatively, but not when it was perceived positively. Further, Elkin and Leippe (1986) showed that, although physiological arousal increased in response to discrepant cognitions, physiological arousal was not immediately abated following inconsistency-reducing behavior. Together, these results suggest that dissonance reduction is aimed toward reducing negative affect, not arousal.

Consistency and the self

Following Festinger's (1957) original theory, several theorists argued that dissonance theory lacked precision (e.g., Aronson, 1968, 1969). Early proponents of this critique pointed to the importance of the self, arguing that inconsistencies elicit aversive feelings of dissonance only when they involve the self-concept. This revision, in turn, provided more precise predictions regarding when dissonance should be felt and dissonance-reducing behaviors should be observed. For example, Aronson (1968, 1969) argued that dissonance arousal is a function of the extent to which information conflicts with self-views and that dissonance-reduction functions as a way to re-establish the self-views that were undermined by the inconsistent information. Aronson further suggested that individuals are motivated to maintain whatever self-view they hold. Thus, negative self-relevant information should arouse dissonance for those with positive self-views, whereas positive self-relevant information should arouse dissonance for those with negative self-views. In support of this argument, people have been found to experience arousal when their performance on a task deviated substantially from their expected performance, and this effect was independent of whether the actual performance had been better or worse than expected (e.g., Aronson & Carlsmith, 1962). That is, participants with positive self-views experienced dissonance in response to doing poorly on a task, whereas participants with negative self-views experienced dissonance in response to doing well on a task.

While Aronson (1968, 1969) argued that people are motivated to restore the consistency of the specific self-concepts that are undermined by cognitive inconsistencies, Steele (1988) hypothesized that the resolution of inconsistency is important only to the extent that it serves as a means to maintain a positive overall self-concept. Thus, Steele (1988) agreed with Aronson (1968, 1969) that the self is fundamentally involved in the elicitation of dissonance, but he asserted that (1) cognitive consistency serves as a means to achieving a superordinate goal and (2) specific inconsistencies need not be addressed so long as a positive self-concept as a whole could be protected. For example, if individuals view themselves as competent but then perform poorly on a test of competence, Aronson (1968, 1969) would suggest that these individuals need to provide rationalizations for their poor performance in order to resolve the inconsistency between their competence-related self-views and their performance. Conversely, Steele (1988) would argue that individuals need not provide evidence of their competence, specifically. Rather, people could affirm other self-views that are unrelated to competence in order to re-affirm a general positive self-concept. Aronson (1968, 1969) would also suggest that individuals who view themselves as incompetent but perform well on a test would need to provide rationalizations for their *good* performance. Steele (1988), on the other hand, would argue that this discrepancy would not arouse dissonance because all individuals are motivated to maintain a *positive* self-concept, which the unexpected good performance does not undermine. In support of Steele's arguments, Steele and Liu (1983) found that participants exhibited dissonance-reducing behaviors only when their self-concept was threatened. When the self was affirmed (i.e., the threat to self was reduced), however, participants did not exhibit dissonance-reducing behaviors, even when the affirmation was unrelated to the specific content of the underlying inconsistency.

In response to theories implicating the self in dissonance arousal, Cooper and Fazio (1984) argued that these perspectives failed to account for considerable amounts of data. To address this limitation, they posited that aversive consequences (i.e., unwanted or undesirable outcomes) are necessary for producing aversive feelings of dissonance. In one study supporting this argument, participants experienced dissonance when they were subtly induced to perform a counterattitudinal behavior: convincing a fellow student that an experimental task was exciting although it was extremely boring. However, this was the case only when their arguments were successful in convincing the other student to participate in the task *and* they liked the other participant (Cooper, Zanna, & Goethals, 1974). These results suggest that dissonance is aroused only to the extent that the underlying inconsistency is associated with aversive consequences (but see Harmon-Jones, Brehm, Greenberg, Simon, & Nelson, 1996).

Impression management

Impression management theory (Tedeschi, Schlenker, & Bonoma, 1971) provides yet another revision to Festinger's (1957) original theory. This theory builds on the perspectives discussed in the section *Consistency and the self* by maintaining (1) the importance of the self in dissonance processes and (2) that cognitive consistency serves as a means towards a super-ordinate goal. However, the impression management perspective deviates from the above theories by arguing that consistency functions as a means to communicate traits to others, rather than as a means to

restore self-concepts. For example, Tedeschi et al. (1971) argued that people are motivated to maintain consistency in order to appear competent to others. While some studies have supported this argument (e.g., Gaes, Kalle, & Tedeschi, 1978), other studies have obtained results that are better explained by a dissonance perspective (e.g., Rosenfeld, Giacolone, & Tedeschi, 1984). To reconcile these discrepancies, Tedeschi and Rosenfeld (1981) suggested that the impression management perspective offers the best theoretical explanation for the maintenance of consistency in situations involving forced compliance, while dissonance theory offers the best explanation for the maintenance of consistency in situations involving effort justification (see discussion of paradigms in section on *Attitude-behavior relations*).

Pragmatic function

Research and theory has continued to suggest, by and large, that consistency serves as a means towards achieving a superordinate goal, rather than a goal in and of itself. However, newer theories have shifted away from perspectives implicating the self, placing more emphasis on the implications of inconsistency for the execution of behavior and the affordance of knowledge. The action-based model of dissonance, for example, suggests that inconsistency elicits aversive feelings of dissonance because inconsistent cognitions disrupt context-appropriate behavior (for a review, see Harmon-Jones, Amodio, & Harmon-Jones, 2009). Supporting this argument, in one study, participants who were asked to make a decision and then make plans to actually carry out their decision (i.e., action-oriented mindset) engaged in dissonance-reducing behavior to a greater extent than those who were not asked to make plans to carry out their decisions (Harmon-Jones & Harmon-Jones, 2002). Other research has linked dissonance arousal with greater activation in the anterior cingulate cortex (ACC), which has been implicated in conflict monitoring (e.g., Amodio, Devine, & Harmon-Jones, 2008). According to the action-based model of dissonance, the obtained link between dissonance and conflict-monitoring suggests that dissonance processes are a function of the need for effective action (see Harmon-Jones & Harmon-Jones, 2008). Thus, the action-based model of dissonance departs from earlier theories by suggesting that dissonance is an adaptive cognitive mechanism (Harmon-Jones et al., 2009). Whereas earlier theories assumed that dissonance represents a shortcoming by indicating a failure of an individual to act in accordance with their beliefs, the action-based model suggests that dissonance is useful in that it helps an individual determine what kinds of actions are appropriate in a given situation.

Epistemic function

Other perspectives suggest that cognitive consistency serves a basic epistemic function, meaning that cognitive inconsistency indicates an error in one's system of beliefs that needs to be addressed (Gawronski, 2012). In line with this idea, Kruglanski and Shteynberg (2012) argued that cognitive consistency is desired not because there is something special about consistency itself, but rather because cognitive consistency validates a system of beliefs. According to this perspective, knowledge about the world is gained through testing various hypotheses that are formed on the basis of beliefs and expectations. Inconsistency, then, indicates that a hypothesis is disconfirmed after testing. Further, the magnitude of the motivation to achieve consistency is a function of how important the validation of the hypothesis is to an individual or the extent to which inconsistency undermines desired knowledge. Expanding on the latter hypothesis, Gawronski (2012) noted that one may be motivated to *invalidate* a hypothesis that is implied by one's beliefs. For example, Mary's beliefs about how unsupportive partners behave coupled with her observations of her partner's behavior may lead to the hypothesis that her partner is unsupportive. If, however, she is motivated to stay with her partner and to view him positively, she may search for information that disconfirms the hypothesis. Thus, Gawronski (2012) argued, consistency is important because it validates one's subjective beliefs, which are often shaped by one's motivations (see Kunda, 1990).

Major Themes

Despite unsettled debates regarding the function of cognitive consistency, the frameworks provided by the reviewed theories have led to important findings across major lines of research. In this section, we review those programs of research and note the important insights they have provided for social cognition.

Attitude-Behavior Relations

Festinger's (1957) original theory suggests that individuals may reconcile inconsistencies between their attitudes and their behavior by either (1) changing their behavior, (2) changing their attitude, or (3) adding an additional cognition that resolves the inconsistency. For example, a smoker may resolve the inconsistency between their smoking behavior and their beliefs about the negative effects of smoking by (1) quitting smoking, (2) believing that smoking does not cause cancer, or (3) believing that the risks of smoking do not apply to them. Following these arguments, a great deal of research sought to understand the ways in which people respond to inconsistencies between their attitudes and their behavior. This research has relied on four basic paradigms: (1) the forced compliance paradigm, (2) the

free choice paradigm, (3) the effort justification paradigm, and (4) the hypocrisy paradigm.

Forced compliance

The forced compliance paradigm is based on the idea that counterattitudinal behavior can lead people to change their attitudes if they are unable to find a situational explanation for their counterattitudinal behavior. In the first demonstration of this effect, Festinger and Carlsmith (1959) had participants complete a boring task and then asked them to tell another student that the task was exciting. One group of participants received $1 in exchange for communicating the excitement of the task to the other participant, while another group received $20. Participants who received the smaller incentive later reported being more interested in the task than participants who received the larger incentive. Festinger and Carlsmith argued that those who received the large amount of money could use it as a situational explanation for their counterattitudinal behavior, leading to no change in their attitude toward the task. Conversely, those who received the small amount could not use it as a situational explanation for their inconsistent behavior, leading them to change their attitude to bring it in line with their behavior.

Free choice

The free choice paradigm is based on the idea that choice decisions can lead to post-decisional dissonance when people recognize either (1) that a rejected option has positive features that the chosen option does not have or (2) that the chosen option has negative features that are not present in a rejected option. To reduce post-decisional dissonance, people are assumed to exaggerate the attractiveness of the chosen option and downplay the attractiveness of rejected options (i.e., *spreading-of-alternatives effect*). In the first demonstration of this effect, Brehm (1956) asked participants to rate several items that were roughly equal in terms of their attractiveness. Participants were then presented with two items that they evaluated similarly in the rating task and asked to select the one they would like to keep. Participants rated the chosen alternative as more attractive after they made their choice than before, whereas they rated the unchosen alternative as less attractive after they made their choice than before. Festinger (1957) argued that this spreading-of-alternatives effect is caused by an aversive feeling of post-decisional dissonance, which is reduced by exaggerating the attractiveness of the chosen item and downplaying the attractiveness of the unchosen item.

Effort justification

The effort justification paradigm is based on the idea that actions involving greater effort or pain result in more favorable attitudes toward the relevant target compared to actions involving smaller effort or pain. To the extent that (1) actions involving a great deal of effort or pain elicit dissonance and (2) there is no justification for the invested effort, people may change their attitude toward the relevant target as a means of dissonance-reduction. A prominent prediction implied by these assumptions is that groups imposing harsh initiation requirements will be more liked than groups whose initiation requirements are relatively lenient. In one study supporting this prediction (Aronson & Mills, 1959), participants learned they could join a group only by passing an initial test in which they were asked to read a series of words aloud from a set of cards. Participants who had to read sexually explicit words aloud (i.e., harsh initiation requirement) later rated the group more positively than participants who had to read neutral words aloud (i.e., lenient initiation requirement).

Hypocrisy

The basic idea behind the hypocrisy paradigm is that dissonance can lead people to change their behavior when they (1) expressed a strong commitment to their attitudes and (2) are subsequently reminded of past failures to act in line with their attitudes. Leveraging these processes, Stone, Aronson, Crain, Winslow, and Fried (1994) encouraged condom use by (1) having participants prepare a videotaped speech about the importance of safe sex and then (2) asking them to think of their past failures to use condoms. Participants who completed both tasks were more likely to purchase and use condoms after the study than participants who completed only one of the two tasks or neither of them. According to Stone (2012), these results (1) demonstrate the applied value of research on cognitive consistency and (2) highlight the "rational" side of dissonance by providing valuable insights for effective interventions in the area of self-regulation.

Issues of interpretation

Although dissonance research on attitude-behavior relations has led to numerous important findings, there are some important ambiguities in the interpretation of these findings. A common practice in dissonance research on attitude-behavior relations is to interpret the focal effect in a given paradigm (e.g., attitude change) as a direct proxy for the elicitation of dissonance. Yet, from the perspective of Festinger's (1957) dissonance theory, such interpretations conflate three distinct processing stages: (1) the identification of inconsistency, (2) the elicitation of aversive feelings of dissonance, and (3) the resolution of inconsistency (see Gawronski & Brannon, in press). For example, some have argued that dissonance is an exclusively Western phenomenon on the basis of research showing that dissonance-related attitude change is much less pronounced in Eastern compared to Western cultures (e.g., Heine & Lehman, 1997; Markus & Kitayama, 1991). However, the mere absence of dissonance-related attitude change among Eastern participants does not necessarily reflect the absence of dissonance. After all, cultural differences in dissonance-related attitude change could also be due to

cultural differences in the strategies to restore consistency (e.g., attitude change vs. search for situational explanation for one's counterattitudinal behavior). Because cultural differences can influence any of the three stages of inconsistency processing (see Gawronski, Peters, & Strack, 2008), it seems premature to interpret cultural differences in the focal effect of a given paradigm as direct reflections of cultural differences in the magnitude of dissonance.

A related issue concerns the role of proximal versus distal motivations in responses to dissonance (e.g., Harmon-Jones et al., 2009). Behaviors associated with dissonance reduction can serve either to reduce the inconsistency itself (i.e., distal motivation) or to mitigate the negative affect felt in response to an inconsistency without addressing the underlying inconsistency (i.e., proximal motivation). In light of this distinction, it becomes problematic to interpret moderating effects on the focal outcome in a given paradigm as definitive evidence for one theoretical perspective over another. For example, the finding that self-affirmation reduces attitude change in classic dissonance paradigms (e.g., Steele & Liu, 1983) is frequently cited as evidence for the central role of positive self-views in dissonance effects. Yet, self-affirmation may simply mitigate the negative affect aroused by cognitive inconsistency, which should eliminate the need for dissonance-related attitude change (see Simon, Greenberg, & Brehm, 1995). The latter interpretation reconciles effects of self-affirmation with theoretical accounts that do not assume a central role of the self (e.g., Gawronski, 2012; Harmon-Jones et al., 2009). Thus, the absence of behaviors aimed at resolving the inconsistency itself should not be taken to mean that feelings of dissonance did not occur. Instead, it is possible that the aversive feelings in response to an inconsistency were mitigated, thereby removing the distal motivation to resolve the underlying inconsistency.

A final ambiguity is that the focal effects in some paradigms can result from alternative processes that do not involve dissonance. For example, Gawronski, Bodenhausen, and Becker (2007) argued that the act of choosing an item creates an association between that item and the self, leading to an associative transfer of positive self-evaluations to the chosen item. Thus, spreading-of-alternative effects in the free choice paradigm could result either from a process of dissonance reduction *or* from a transfer of positive self-evaluations to the chosen item (or both). This ambiguity prohibits conclusions regarding the elicitation of dissonance from the mere observation of a spreading-of-alternative effect. For example, Lieberman, Ochsner, Gilbert, and Schacter (2001) showed a spreading-of-alternative effect for amnesiacs who had no explicit memory for their decisions. Based on this finding, the authors concluded that dissonance does not require conscious access to the dissonance-eliciting cognitions. However, this conclusion stands in contrast to research using the hypocrisy paradigm, showing that past failures to behave in line with one's attitude have to be consciously accessible to elicit aversive feelings of dissonance (e.g., Fried & Aronson, 1995; Stone et al., 1994). This discrepancy can be reconciled by assuming that the spreading-of-alternatives effect obtained for amnesiacs is due to an alternative process that does not involve dissonance, such as the associative transfer of valence from the self to a newly owned object (see Gawronski et al., 2007).

Exposure to New Information

Another line of consistency research that has provided valuable insights into basic social-cognitive processes is the body of work on exposure to new information. Two central themes in this work concern the conditions under which people update their beliefs in response to expectancy-violating information and selective exposure to information that is consistent with one's beliefs.

Stereotype disconfirmation

Responses to expectancy-violating information have been particularly important in understanding stereotype disconfirmation and the processes underlying the preservation of stereotypes following disconfirming information (for a review, see Sherman, Allen, & Sacchi, 2012). Stereotypes provide expectancies, which allow for the prediction of the future behavior of others, and information contrary to these expectancies triggers a variety of cognitive mechanisms aimed at resolving the inconsistency. A large body of research suggests that stereotype disconfirming individuals are often viewed as exceptions to the rule and are set apart from the rest of the stereotyped group, allowing perceivers to maintain their stereotypes while still taking into account the new information. (i.e., *subtying*; Weber & Crocker, 1983). For example, if someone who holds the stereotype that athletes are unintelligent encounters an athlete who is intelligent, they may deem this intelligent athlete as an exception to the rule by creating a special subtype of athletes who are intelligent. In this case, stereotypical beliefs about athletes will go unchanged despite the exposure to counter-stereotypical information. Research has identified various conditions under which consistency is maintained by updating stereotypic beliefs rather than by subtyping. For example, counter-stereotypical information is more likely to be generalized to the rest of the group when the counter-stereotypical exemplar is a prototypical group member (e.g., Johnston & Hewstone, 1992). Conversely, counter-stereotypical exemplars are more likely to be subtyped when the counter-stereotypical information is extreme (Kunda & Oleson, 1997) or when the presence of ambiguous information facilitates the creation of a subtype (Kunda

& Oleson, 1995). Further, because subtyping requires a substantial amount of cognitive resources, cognitive load leads counter-stereotypic information to be generalized to the group as a whole by disrupting the subtyping of counter-stereotypical exemplars (e.g., Moreno & Bodenhausen, 1999; Yzerbyt, Coull, & Roucher, 1999).

Contextualized attitude change

Research on expectancy-violation has also been leveraged to understand the link between attitude change and context effects on evaluative responses. Several studies suggest that changes in attitudes can be limited to the context in which counter-attitudinal information was learned (e.g., Gawronski, Rydell, Vervliet, & De Houwer, 2010; Gawronski, Ye, Rydell, & De Houwer, 2014; Ye, Tong, Chiu, & Gawronski, 2017). In these studies, counter-attitudinal information influenced evaluations only within the context where that information was learned, whereas initial attitudinal information continued to determine evaluations in all other contexts. According to Gawronski et al. (2010), these effects are due to heightened attention to contextual cues during exposure to expectancy-violating information as opposed to expectancy-consistent information (see Roese & Sherman, 2007). As a result of this heightened attention, the context is integrated into the mental representation of the counter-attitudinal information, leading to the patterns of evaluation outlined above. For example, if Sally forms a positive first impression of Jim in a grocery store and later finds Jim being mean to children at a park, the initial positive information may be stored in a context-free representation whereas the expectancy-violating negative information may be stored in a contextualized representation that includes the park. Thus, when Sally later encounters Jim at the grocery store (original learning context) or at the post office (completely novel context), her evaluations may reflect her original, positive impression. Yet, when Sally later encounters Jim at the park (context in which the counter-attitudinal information was received), her evaluations may reflect the new, negative information. According to Gawronski and Cesario (2013), such context effects should be particularly pronounced for spontaneous evaluative responses (i.e., implicit evaluations), given that contextual cues may determine which information is activated automatically in response to an attitude object.

Selective information search

The research reviewed thus far has focused primarily on how individuals may reconcile existing inconsistencies, but people may also avoid inconsistencies altogether via selective exposure to information. Numerous studies have shown that individuals prefer information that is in line with their beliefs and attitudes, regardless of the information's accuracy (for a review, see Frey, 1986). Meta-analytic data by Hart et al. (2009) suggest that this tendency is exacerbated by factors that increase the motivation to defend one's beliefs (e.g., strong commitment). Conversely, the tendency to search for confirmatory information is mitigated by factors that increase the tolerance for inconsistent information (e.g., high confidence).

Substantial evidence for the use of selective exposure to maintain consistency comes from research on how people maintain views of the self. In opposition to research suggesting that people are generally motivated to enhance their self-views (e.g., seek overly positive information about themselves; Taylor & Brown, 1988), Swann (1983) suggested individuals are motivated to seek information that is consistent with their self-views. In support of this assumption, Swann and Read (1981a) found that individuals with high self-esteem sought positive feedback from others, whereas individuals with low self-esteem sought negative feedback from others. Further, Swann and Read (1981b) found that participants elicited evaluations from others that confirmed their self-views, particularly when the participants expected that their partners' evaluations would be inconsistent with their self-views. Based on these and other findings, Swann (1983) argued that people are particularly inclined to engage in self-verifying behavior when they anticipate feedback that is inconsistent with self-views. This assumption is in line with Festinger's (1957) argument that individuals may avoid situations they expect to be particularly dissonance-arousing.

Implicit and Explicit Evaluation

In addition to informing research on attitude-behavior relations and attitude change, cognitive consistency perspectives have provided valuable insights into the relation between implicit and explicit evaluations. A common finding in the literature on implicit and explicit evaluation is that correlations between these two types of evaluations are relatively low overall (for meta-analyses, see Cameron, Brown-Iannuzzi, & Payne, 2012; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). Cognitive consistency frameworks have been used to explain these discrepancies and to identify conditions under which correlations may be higher. For example, the associative-propositional evaluation (APE) model postulates that implicit evaluations reflect the activation of positive or negative associations with a given stimulus, whereas explicit evaluations reflect the validation or rejection of these associations on the basis of their consistency with other salient cognitions (Gawronski & Bodenhausen, 2006, 2011). Hence, correlations between implicit and explicit evaluations should be low to the extent that activated associations captured by measures of implicit evaluations are inconsistent with other salient cognitions and therefore rejected as a basis for explicit evaluations.

Yet, correlations between implicit and explicit evaluations should be high to the extent that these associations are consistent with other salient cognitions and therefore accepted as a basis for explicit evaluations. Supporting these predictions, Gawronski, Peters, Brochu, and Strack (2008) found that racial bias in implicit and explicit evaluations were weakly correlated when participants disapproved of negative evaluations of disadvantaged groups and, at the same time, believed that African Americans represent a disadvantaged group. Yet, racial bias in the two kinds of evaluations were highly correlated when participants (1) disapproved of negative evaluations of disadvantaged groups, but believed that African Americans do not represent a disadvantaged group, or (2) participants believed that African Americans represent a disadvantaged group, but accepted negative evaluations of disadvantaged groups.

Based on the same theoretical assumptions, cognitive consistency perspectives have also provided better understanding of changes in explicit and implicit evaluations and the conditions under which changes in one should coincide with changes in the other (see Gawronski & Bodenhausen, 2006). For example, drawing on the assumption that cognitive consistency is central to the propositional validation of activated associations, Gawronski and Strack (2004) found that counterattitudinal behavior in the induced compliance paradigm effectively changed explicit evaluations without any changes in implicit evaluations. Moreover, implicit evaluations showed a significant positive correlation with explicit evaluations under control conditions and when participants had a situational explanation for their counterattitudinal behavior. Yet, implicit and explicit evaluations were uncorrelated when participants changed their explicit evaluations in response to their counterattitudinal behavior.

Cognitive Balance

Another line of consistency research within social cognition concerns the mechanisms by which balance principles influence evaluations of objects, individuals, and social groups. Two major themes in this research are the formation of interpersonal attitudes and mental representations of the self.

Interpersonal attitudes

One line of research leverages the postulates of Heider's (1958) balance theory to understand the formation interpersonal attitudes (for a review, see Walther & Weil, 2012). For example, in a study by Aronson and Cope (1968), participants interacted with either a pleasant or an unpleasant experimenter, and then observed a supervisor either chastising or praising the experimenter. Participants who saw the supervisor praise the pleasant experimenter were more likely to do a favor for the supervisor than participants who saw the supervisor chastise the pleasant experimenter. Conversely, participants who saw the supervisor praise the unpleasant experimenter were less likely to do a favor for the supervisor than participants who saw the supervisor chastise the unpleasant experimenter. These findings suggest that interpersonal attitudes are formed in line with the principles of cognitive balance, rather than via a simple transfer of valence from one person to any individual that is somehow related to that person, as suggested by the idea of associative link formation in evaluative conditioning (see Walther, 2002).

Expanding on these findings, Gawronski, Walther, and Blank (2005) suggested that balance principles influence interpersonal attitudes by shaping the encoding of information about the relation between individuals rather than the retroactive construal of evaluations. In their research, participants were presented with positive or negative information about their "colleagues" in a new-job scenario. Afterwards, the participants learned whether these colleagues either liked or disliked other, yet unknown individuals. In line with Aronson and Cope's (1968) findings, participants evaluated the unknown individuals more favorably when they were liked by a positive colleague than when they were disliked by a positive colleague. Conversely, participants evaluated the unknown individuals less favorably when they were liked by a negative colleague than when they were disliked by a negative colleague. Importantly, this pattern emerged only when participants first formed a positive or negative impression of their new colleagues and then received information about whether their new colleagues liked or disliked other, yet unknown, individuals. When participants first received information about whether their new colleagues liked or disliked other, yet unknown, individuals and then formed a positive or negative impression of their new colleagues, the two pieces of information influenced attitudes in an additive rather than interactive manner (see also Langer, Walther, Gawronski, & Blank, 2009). That is, participants evaluated the unknown individuals more favorably when they were liked than when disliked by a new colleague (regardless of whether the colleague was positive or negative). Moreover, participants evaluated the unknown individuals more favorably when they were associated with a positive colleague than when they were associated with a negative colleague (regardless of whether the unknown individuals were liked or disliked by the colleague).

Balanced identity

Drawing on Heider's (1958) balance theory, Greenwald et al. (2002) sought to provide a unifying framework for research on implicit attitudes, stereotypes, self-esteem, and self-concept. A key assumption of their framework is that the association between two unrelated (or weakly related) concepts can be established (or strengthened) by virtue of their common relation with a third concept. For example, if

Mike associates the end of basketball season with spring and associates spring with flowers, Mike will come to associate flowers with the end of basketball season, even though the two concepts are not directly related. In support of these assumptions, Greenwald et al. showed that people's implicit evaluation of their ingroup, their implicit self-concept as a member of this group, and their implicit self-evaluation are related in a manner such that one is predicted by the interaction of the other two (i.e., balanced identity). In one study, for example, women's implicit self-evaluations were predicted by the interaction of their implicit self-associations as female and their implicit evaluations of women. That is, the stronger women associated the category women with a positive (negative) evaluation, and the stronger they associated themselves with the category women, the more positive (negative) was their implicit self-evaluation. Corresponding patterns emerged in the prediction of implicit evaluations of women and the prediction of implicit self-associations as female. Interestingly, patterns of balanced identities were generally obtained for implicit measures, whereas explicit measures often showed patterns of imbalanced identities (for a meta-analysis, see Cvencek, Greenwald, & Meltzoff, 2012).

Greenwald et al.'s (2002) framework was seminal in the sense that it was the first one to apply consistency principles to research using implicit measures, opening the door for an entirely new body of empirical and theoretical insights. Gawronski, Strack, and Bodenhausen (2009) further enriched these insights by specifying the mental processes by which consistency principles influence responses on explicit and implicit measures. Drawing on the distinction between associative processes (which are assumed to be the proximal determinant of responses on implicit measures) and propositional processes (which are assumed to be the proximal determinant of responses on explicit measures), they argued that dissonance is an exclusive product of inconsistency between propositional thoughts, involving subjective beliefs about the relation between objects (e.g., *I like Brandon*; *Helen is smart*; *Lydia hates cats; sunscreen prevents skin cancer*). In contrast, balanced identities on implicit measures should be understood as the result of spreading activation between concepts in associative memory, not as the product of a desire to maintain consistency between beliefs via propositional reasoning.

An illustrative example are the two processes that may lead to the spreading-of-alternatives effect in the free choice paradigm. On the one hand, a spreading-of-alternatives effect may occur when people recognize that a rejected option has positive features that the chosen option does not have or that the chosen option has negative features that are not present in a rejected option. In this case, people may exaggerate the attractiveness of the chosen option and downplay the attractiveness of the rejected to reduce aversive feelings of post-decisional dissonance (Brehm, 1956). On the other hand, the act of choosing an object may create an association between the newly owned object and the self, which may lead to an associative transfer of one's positive self-evaluations to the newly owned object (Gawronski et al., 2007). The latter case reflects the key principle in research on balanced identities, involving the formation a new association between two unrelated concepts (i.e., object-positive) by virtue of their common relation with a third concept (i.e., object-self, self-positive). Although the two processes have both been linked to "consistency" principles and either one of them can lead the same outcome (e.g., spreading-of-alternatives effect), their psychological nature is fundamentally different according to Gawronski et al. (2009).

New Ways Forward

Despite the long tenure of consistency research, several new lines of work continue to provide deeper insights into the fundamental role of cognitive consistency in social cognition. Resonating with the idea of three distinct stages in the processing of inconsistency, these works have focused on the identification of inconsistencies, the elicitation of aversive feelings of dissonance, and the behavioral responses aimed to restore inconsistency or mitigate the negative feelings arising from inconsistency.

Lay Perceptions of Inconsistency

Festinger's (1957) original definition of what constitutes an (in)consistency centered around formal logic, and subsequent research continued to distinguish consistency from inconsistency on the same grounds. However, Festinger also suggested that what is deemed as inconsistent could vary from person to person depending on factors such as individual differences or cultural mores. Thus, instead of following the rules of formal logic, it is possible that lay perceptions of (in)consistency are driven by "psycho-logic" in that individuals may perceive inconsistency when there is logical consistency, and vice versa (see Gawronski and Brannon, in press). In line with this idea, participants in a study by Brannon, Sacchi, and Gawronski (2017) showed a surprise response after learning new information about an individual that was incongruent with the valence of their initial impression of that individual. Further, this effect of valence incongruence generalized across the dimensions of warmth and competence, suggesting that an initial impression along one dimension sets up expectations regarding how the individual would behave in terms of the other dimension (see also Judd, James-Hawkins, Yzerbyt, & Kashima, 2005). For example, after forming a positive impression of the target person's warmth, participants were equally

surprised when the target performed an incompetent behavior as when the target performed a cold behavior (and vice versa). Because formal logic says nothing about how trait dimensions may be related, it seems that participants were relying on their own psycho-logic, or lay notions, regarding the relation between warmth and competence.

Similar ideas were put forward by Johnson-Laird, Girotto, and Legrenzi (2004), who argued that people rely on mental models to determine whether propositions are (in)consistent. According to their account, a set of propositions is deemed as consistent to the extent that an individual can generate a mental model in which all of those propositions are true. Conversely, a set of propositions is deemed as inconsistent to the extent that an individual is unable to generate a mental model in which all of those propositions are true. Thus, the easier one can come up with a model containing all of the propositions being evaluated, the more likely those propositions are to be deemed as consistent. In support of this assumption, Ragni, Khemlani, and Johnson-Laird (2014) found that participants were faster and more accurate in judging the consistency between statements when a large set of exemplars were available to test the propositions. Conversely, participants were slower and less accurate in judging the consistency between statements when fewer exemplars were available to test the propositions. An important aspect of this approach to consistency assessment is that, although it leads to logically accurate judgments in most cases, it can lead to (1) systematic illusions of consistency in cases of logical inconsistency and (2) systematic illusions of inconsistency in cases of logical consistency (for a review, see Johnson-Laird et al., 2004).

Affective Responses to Inconsistency

Although early research seemed to largely support the role of negative affect in motivating dissonance reduction, more recent research on the experience of surprising events revealed mixed findings. For example, whereas some studies suggest that unexpected positive events elicit negative affect (e.g., Noordewier & Breugelmans, 2013; Topolinski & Strack, 2015), other studies suggest that unexpected positive events elicit positive affect in line with the hedonic quality of the unexpected event (e.g., Shepperd & McNulty, 2002; Valenzuela, Strebel, & Mellers, 2010). To account for these discrepant findings, Noordewier, Topolinski, and Van Dijk (2016) proposed that the nature of affective responses to inconsistency depends on the successful resolution of the inconsistency, which requires on focus on the temporal dynamics of surprise. According to this view, unexpected events tend to elicit an immediate negative response regardless of whether they are positive or negative. Yet, once the individual is able to make sense of the inconsistency, the affective response changes in line with the hedonic quality of the unexpected event, leading to positive affect for positive events and negative affect for negative events.

Uniting Responses to Inconsistency

The themes reviewed in the previous sections represent relatively independent lines of research that are rarely linked to their common denominator. To overcome this limitation, there have been calls for uniting these disparate lines of work under one theoretical umbrella. A prominent example is the Meaning Maintenance Model (MMM; Proulx & Inzlicht, 2012), which suggests that all consistency-related findings can be interpreted as the result of palliative behaviors in response to violated expectancies (or "meaning violations"). According to the MMM, violations of meaning elicit feelings of having lost a sense of control and the ability to predict the environment. To reinstate a sense of predictability and control, individuals are assumed to engage in any of five behaviors: (1) altering the current system of beliefs to account for the inconsistent information, (2) re-framing the inconsistency to force it to fit with the current system of beliefs, (3) affirming other beliefs that may be unrelated to the system of beliefs in which the inconsistency occurred, (4) extracting predictable patterns from the environment, or (5) constructing an entirely new word view that accounts for the data the individual has observed. These behaviors are described as palliative in the sense that they reduce the anxiety that arises in response to an inconsistency without necessarily resolving the inconsistency itself (Proulx, Inzlicht, & Harmon-Jones, 2012).

Conclusion

Research on cognitive consistency has a long and rich history within social psychology. For decades, major lines of research in this area have proceeded independently with relatively little overlap. Yet, recent work has facilitated cross-talk between these works by linking a broad range of phenomena to their common roots in cognitive consistency (see Gawronski & Strack, 2012; Proulx et al., 2012). Moreover, although there is consensus about the significance of consistency for the processing of social information, new lines of research continue to refine existing theories, while building on the insights forged over the preceding decades. The insights provided by this research have advanced our understanding of basic social-cognitive processes in ways that would not have been possible in their absence. In this sense, cognitive consistency has become one of the most significant theoretical concepts in the area of social cognition.

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