New perspectives on cognitive dissonance theory

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Abstract
Cognitive consistency is generally considered a fundamental aspect of the human mind, and cognitive dissonance theory is the most famous and studies theory within this framework. Dissonance theory holds that when related cognitions are in conflict (e.g. when behaving counter to one’s attitudes), people will experience negative affect. This affective reaction motivates people to engage in various dissonance-reduction strategies (e.g. attitude change). The aim of this thesis was to investigate some novel, and unanswered questions within dissonance research, and to relate dissonance theory to neighboring theories.

In Study I, it was predicted (and supported) that cognitive dissonance (writing a counter-attitudinal essay in the induced-compliance paradigm) would lead to people exhibiting an abstract mindset. The rationale for this prediction (based on action-identification theory) was that unfamiliar and difficult situations, were action is usually impeded (much like dissonant situations), lead to individuals adopting more concrete representations of the situation – for the sake action execution. However, since people usually want to find meaning in their actions, they will quickly, after the action is executed, adopt an abstract representation of the situation – which might also lead to spillover effects were people’s mental representation of their actions in general become more abstract.

In Study II, the aim was to investigate to what extent, and how, emotions relate to the attitude-change effect in the induced-compliance paradigm. Past researchers usually predict that negative emotions should be positively related to this effect. Based on the notion of emotion regulation, however, attitude change (a form of reappraisal) implies that people are positively (and less negatively) tuned to the situation – and should therefore feel more positive (and less negative) emotions towards the situation. Thus, contrary to past research, it was predicted that negative emotions would be inversely related to attitude change, and positive emotions would be positively related to attitude change. Result across two experiments supported these predictions.

Lastly, in Study III, the aim was to provide a general theoretical model of dissonance reduction. Based on a cognitive-emotion perspective (including appraisal theories of emotion, emotion regulation, and coping), it was suggested that reduction processes are influenced by the intensity of the initial affective reaction. This affective reaction is in turn influenced by the magnitude of the dissonance and the novelty-familiarity dimension of the situation. When the dissonance magnitude is too big, and the situation novel, people might disengage rather quickly (leaving the situation or distracting themselves). If, however, people have enough motivation and cognitive capacity, they might engage more in the reduction processes. The advantage of this model is that it can be applied to any dissonant situation.

Taken together, these studies suggest that there is still much to discover in dissonance research, and much can be gained by conceptualizing dissonance processes within a cognitive-emotion framework. Future research should focus more on how the social context (e.g. influence of other people) might affect these dissonance processes. More emphasis should also be put on the prevalence of different dissonant situations, and the accompanied reduction attempts, in real-life settings.

Keywords: Cognitive dissonance theory, Attitude change, Dissonance reduction, Emotion regulation, Mental representations.
NEW PERSPECTIVES ON COGNITIVE DISSONANCE THEORY
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Sebastian Cancino Montecinos
To my family and friends
Kognitiv koherens betraktas generellt som en grundläggande aspekt av det mänskliga sinnet, och kognitiv dissonansteori är den mest kända och studerade teorin inom denna forskning. Dissonansteorin vilar på premisse att människor upplever negativa emotioner när relaterade kognitioner är i konflikt med varandra (t.ex. när människor biter sig i stäv med sina attityder). Denna emotionella reaktion motiverar människor att försöka reducera dissonansen på något sätt (t.ex. genom att ändra attityd). Syftet med den här avhandlingen var att undersöka nya och obesvarade frågor inom dissonansforskning samt att relatera dissonansteori till angränsande teorier.

Studie I visade att kognitiv dissonans (som inducerades genom att låta personer skriva en text om något de egentligen inte håller med om) ledde till att människor förmade mer abstrakta representationer av deras generella handlingar. Skälen för denna prediktion (baserad på action-identification teorin) var att okända och diffusa situationer (dvs. typiska dissonanta situationer) kan vara svåra att få ett grepp om, och därmed också svåra hantera, vilket leder till att individer antar mer konkreta representationer av situationen – i syfte att kunna lösa den dissonanta situationen. Men eftersom människor vanligtvis vill finna mening i sina handlingar kommer de snabbt anta en mer abstrakt representation av situationen vilket i sin tur leder till att individens mentala representation av deras handlingar i allmänhet blev mer abstrakta.

I studie II var syftet att undersöka i vilken utsträckning emotioner relaterar till attitydförändringseffekten (efter att ha skrivit en text om något man inte håller med om). Tidigare dissonansforskare har antagit att negativa emotioner är relaterade till ökad attitydförändring. Basera på teorier om emotionsreglering så kan attitydförändring tolkas som att människor är mer positivt (och mindre negativt) inställda till situationen – och bör därför känna mer positiva (och färre negativa) emotioner gentemot den tidigare dissonanta situationen. I motsats till tidigare forskning predicerades således att negativa emotioner skulle istället relatera till minskad attitydförändring och positiva emotioner skulle relatera till ökad attitydförändring. Resultat från två experiment bekräftade dessa prediktioner.

I studie III var syftet att utveckla en allmän teoretisk modell för dissonansreduktion. Basera på ett brett kognitions- och emotionsperspektiv (inklusive teorier om emotionsbedömningar, emotionsreglering och coping) föreslår modellen att reduktionsprocesser påverkas av intensiteten i den initiala affektiva

Sammantaget tyder dessa studier på att det fortfarande finns mycket att utforska inom dissonansforskning och att mycket kan upptäckas genom konceptualiseringen av dissonansprocesser som emotionsbedömning och emotionsreglering. Framtida forskning bör fokusera mer på hur det sociala sammanhanget (t.ex. påverkan från andra människor) kan påverka dissonansprocesser. Mer tonvikt bör också läggas på förekomsten av olika dissonanta situationer och de efterföljande dissonansreduceringsförsök i mer vardagliga miljöer.
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List of studies


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Introduction

Cognitive consistency

The concept of cognitive consistency, and in particular cognitive dissonance theory, has been at the forefront of social psychology ever since it was introduced in the mid-1950s (see Abelson, Aronson, McGuire, Newcomb, Rosenberg, & Tannenbaum, 1968; Gawronski & Strack, 2012 for extensive reviews). This concept has its roots in early Gestalt psychology, which suggests that the mind seeks to organize its surrounding in a neat, easily digestible, and coherent way to navigate through a myriad of stimuli (Köhler, 1959). At the very core of the cognitive consistency framework lies the assumption that people seek coherence in values, attitudes, behaviors, feeling, beliefs, etc. It follows from this assumption that any disruption (i.e., inconsistency) to a stable system of cognitions will create a tense psychological feeling that must be dealt with (Abelson et al., 1968; Gawronski & Strack, 2012). Aside from dissonance theory, some of the more prominent consistency theories are balance theory (Heider, 1958) which focused on interpersonal relationships, congruity theory (Osgood & Tannenbaum, 1955) studying communication, symmetry theory (Newcomb, 1953), and the affective-cognitive consistency model (Rosenberg, 1956) which focused on inconsistency between feelings and attitudes (i.e., ambivalence). In 1968, Abelson and colleagues published an extensive handbook on the consistency framework (Abelson et al. 1968), tackling these different issues from a variety of angles. Ironically, this publication seemed to have closed research on the consistency concept as the following two decades saw very few publications on this topic. In the early 1990s, however, dissonance theory made a strong comeback with Aronson’s publication in Psychological Inquiry (1992). In this paper, Aronson made the case that many of the contemporary “mini-theories” in social psychology could easily be explained by dissonance theory (Aronson, 1992). This led psychologists to once again begin to appreciate the usefulness of dissonance theory. The last decade and a half have also seen a strong return of the cognitive consistency framework as a whole (Gawronski, 2012). To illustrate, the concept is used to understand psychological phenomena at vastly different levels of analysis, from its relationship to consciousness (Morsella, 2005), implicit social cognition such as implicit ambivalence (Petty, Tormala, Brinol, & Jarvis, 2006) and implicit self-esteem (Jordan, Whitfield & Zeigler-Hill, 2007), to its relationship to mental models (Johnson-Laird, Girotto, Legrenzi, 2004), more explicit
decision making (van Harreveld, van der Pligt & de Liver, 2009), explicit group behavior such as prejudice (Gawronski, Peters, Brochu & Strack, 2008), in-group bias (Walther & Weil, 2012), and group formation (Park, Tindale & Hinsz, 2012).

In this thesis, however, I will focus on dissonance theory, the most famous and studied theory within the cognitive consistency framework. I will begin with presenting the basic principles of the theory and then provide a short historic account of its development from Festinger’s original formulation of the theory (see also Cooper, 2007; Harmon-Jones & Mills, 1999; Harmon-Jones, 2019 for extensive reviews). I will then present how the further development of dissonance theory could benefit from other research areas – which is the overarching purpose of this thesis. In the general discussion, I will return to the broader concept of cognitive consistency.

Cognitive dissonance theory

In Festinger’s original formulation of dissonance theory he stated that cognitions (i.e., bits of information about oneself or the social and physical world) could either be relevant or irrelevant to one another. When relevant cognitions are found to be incompatible, the individual will experience cognitive dissonance, defined as a drive-like physiological reaction (similar to hunger), which produces psychological discomfort and motivates the individual to reduce the conflict (Festinger, 1957). Because dissonance is negative, and people rarely want to experience negative emotions, these basic assumptions of the theory generate two general hypotheses: (1) the aversive feeling of dissonance will motivate people to reduce dissonance, and (2) people will try to avoid situations and information that could increase a specific state of dissonance.

Cognitive dissonance may arise when we become aware that our actions contradict our attitudes, such as when eating pork chops while dining with the in-laws despite being a vegan. Importantly, however, Festinger’s view of situations that could produce dissonance was wider than is usually assumed. Thus, in his view, a violation against physical reality, such as standing in the rain and realizing that you are not getting wet, would most definitely cause a state of dissonance. A further key concept in the original theory is the dissonance ratio. Most situations in our daily lives involve both dissonant and consonant cognitions, and the amount of dissonance – the dissonance ratio – was conceptualized as the proportion of dissonant to consonant cognitions (i.e., D / D + C). Furthermore, the more important the cognition, the more weight it has. In the example above, if the individual feels that having a nice family dinner with the in-laws is more important than adhering to a specific diet, then that cognition is more important. Thus, the cognition most resistant to change
will dictate how an individual will reduce dissonance. The cognition most resistant to change has later been called the generative cognition (Beauvois & Joule, 1996, 1999), and all other cognitions are assessed in relation to it.

Dissonance reduction

Festinger proposed three major ways in which people could reduce dissonance: (1) change one of the dissonant cognitions; (2) add consonant cognitions; and (3) reduce the importance of dissonant cognitions. These three high-order strategies lead to an array of different specific ways of reducing dissonance. The most common strategy mentioned in the literature is attitude change, that is, when people become more positively attuned to a previously negatively held attitude (Festinger & Carlsmith, 1959). Trivialization is another strategy people might employ in dissonant situations. This strategy entails downplaying the importance of the dissonant behavior, or of the original attitude (Simon, Greenberg, & Brehm, 1995). When people feel that their behavior has contradicted a highly important attitude, they might reduce dissonance by strengthening the original attitude. This is called attitude bolstering (Sherman & Gorkin, 1980). If the individual manages to find an external cause for the dissonant behavior, he/she might be able to deny responsibility for the dissonant behavior (Gosling, Denizeau, & Oberle 2006). Lastly, when people are reminded that they do not live as they claim to, they might engage in behavioral change as a way of trying to make amends for past dissonant behavior (Stone, Aronson, Crain, Winslow, & Fried, 1994). Since Festinger presented his theory in rather abstract and general terms, it is applicable to a wide range of different psychological phenomena. Next, I present the most typical manners in which the hypotheses derived from the simple premises of dissonance theory has been studied.

Experimental set-ups

In the induced-compliance paradigm (Festinger & Carlsmith, 1959), the main purpose is to make the individual engage in a behavior in conflict with his/her cognitions. A common way of doing this is to have participants write a counter-attitudinal essay on some topic (usually asking students to argue for a tuition increase). A typical prediction is that after writing such text people will change their attitude, or at least lean towards the attitude expressed in the text. Another common way to test the main hypotheses of dissonance theory is via the free choice paradigm (Brehm, 1956). This is a decision-making procedure in which participants are required to choose between equally attractive (or unattractive) alternatives. The common prediction is that people, after making their decision, will tend to increase their liking of the chosen alternative and decrease their liking of the non-chosen alternative – presumably to decrease
the probability of experiencing dissonance in the future should they be confronted with their decision. This is called spreading of alternatives. A third method used to test the theory is called the effort-justification paradigm (Aranson & Mills, 1959). Here, individuals work hard to attain a higher-ordered goal, such as undergoing questionable initiation rituals to become members of a specific group. The rationale behind this experimental procedure is that an individual will value the goal more the harder he/she had to work to attain the objective – presumably to guard against post-behavioral regret. A fourth way of inducing dissonance is called the induced-hypocrisy paradigm, and it stems from a more self-oriented perspective of dissonance (Stone et al., 1994). This viewpoint focuses more on dissonance as a reaction to an individual’s self-threat. The set-up involves having an individual publicly condemn an amoral behavior (i.e., littering on the street), and then asking that individual to reflect upon times when he or she acted in that way. The purpose is to make the individual experience dissonance by making their hypocrisy obvious. The selective exposure paradigm is another way in which researchers have tested the hypotheses derived from the theory. Here, participants are asked to browse through newspapers, and the prediction is that people will attend more to headlines that are in line with their current attitudes and values. Finally, exposing individuals to belief dilemmas is a further way of inducing cognitive dissonance. In what is called the belief-disconfirmation paradigm, individuals are confronted with information counter to their beliefs, which produces dissonance. One way of dealing with this, aside from simply accepting the new information, could be to seek support from those who share your beliefs, but also to refute and/or misperceive/misinterpret the new information (see e.g. Gawronski, Ye, Rydell, & De Houwer, 2014).

As is evident from the different research paradigms described above, dissonance can arise from vastly different types of conflicts. However, developments of the basic dissonance theory have centered around the attitude-change effect observed in the induced-compliance paradigm. In the following subsections, I provide a brief historic account of the development of and challenges to dissonance theory, as well as present current views of the theory and developmental areas.

Historical landmarks

Dissonance theory spawned from the consistency framework emphasizing humans’ need for experiencing consistency within themselves and their surroundings. Although other consistency theories (balance theory, congruity theory, symmetry theory, etc.) were well-developed, dissonance theory, with its simplicity, counterintuitive predictions, and universal appeal, emerged as the most studied and scrutinized of all consistency theories. The basic premise within this theory is thus that people experience cognitive conflicts as psychologically uncomfortable (or as negative arousal), and that this motivates them
to somehow resolve the conflict. The most well-known study within the theory, cited in virtually every introductory book to psychology, is Festinger and Carlsmith’s (1959) study, which showed that people were not simply driven by punishment and reward mechanisms as suggested by the then dominating reinforcement theory (Skinner, 1958). On the contrary, they found that people who received less reward (1 USD vs. 20 USD) for deceiving a fellow participant that a boring task was fun, actually liked the task more and were more willing to undertake similar tasks in the future. The dissonance theory suggests that insufficient justification (only receiving 1 USD for lying) leads to the motivation of finding an internal explanation for the behavior.

The early success of dissonance theory led to some challenges from researchers questioning the dissonance explanation for the famous attitude-change effect. Bem (1967, 1972) argued that self-perception theory could account for these effects. More precisely, he claimed that people changed their attitude because they reflect on their behavior and think to themselves: “maybe I do enjoy this”. Thus, according to Bem no negative emotional tension would necessarily follow from experiencing cognitive conflict. Other challenges came from impression-management theory (Tedeschi, Schlenker, & Bonoma, 1971), where it was argued that people change their attitude merely because they wish to be perceived in a specific way by other people (e.g., the experimenter). This account does not see the change in attitude as genuine, but simply as a way of not being perceived unfavorably. Both these early challenges were refuted by research showing that they could not account for the vast amount of intricate results. For instance, impression management theory could not account for the spreading-of-alternatives effect obtain in the free-choice paradigm. Further, in contrast self-perception theory, several studies have shown evidence for both the physiological reaction of dissonance induction (e.g., Elkin & Leippe, 1986) and self-reported negative emotion (e.g., Elliot & Devine, 1994). Hence, in the years that followed, dissonance theory with its simple and elegant premises thrived.

Festinger’s formulation of dissonance theory also faced challenges from within the dissonance camp. In the first of three major reformulations, all highlighting the importance of an individuals’ self-concept, Aronson (1969; 1992) argued that not all cognitive conflicts (e.g., standing in the rain without getting wet) would be enough to produce a negative affective state motivating the individual to certain behavioral tendencies or cognitive maneuvers. He argued that the conflict must be related to more profound cognitions regarding people’s moral self and thus that people would only experience dissonance when their self-integrity was threatened. In a similar fashion, Cooper and Fazio (1984) proposed, in their New Look Model of Dissonance, that people experience dissonance only when they are personally responsible for having caused aversive consequences to themselves and/or others. In other words, a sense of self-accountability and aversive consequences are necessary conditions for experiencing dissonance. They further argued that the dissonance reduction
process aims at dealing with these aversive consequences – rather than regaining a state of consonance between cognitions. In a third challenge to the original formulation, Steele and Liu (1983) argued, from the perspective of self-affirmation theory, that people experience dissonance only when their behavior threatens their self-image. Similar to the New Look Model, the self-affirmation account does not consider consonance as the reason for the dissonance-reduction process, but rather restoration of one’s self-image.

Despite these challenges and considerations, the basic premises of the original theory, the experience of dissonance after cognitive conflict and the concomitant motivation to reduce it, have been supported by empirical tests throughout recent decades. In fact, research has shown that even perceptual inconsistencies produce negative affect and motivation-like responses (Levy, C., Harmon-Jones, & E. Harmon-Jones, 2018; Randles, Inzlicht, Proulx, Tullett, & Heine, 2015). In the last decade, there has been a shift in focus back to Festinger’s original formulation (see Gawronski & Brannon, 2019; Gawronski & Strack, 2012; Harmon-Jones, 2019; Harmon-Jones, Amodio, & Harmon-Jones, 2009; McGregor, Newby-Clark, & Zanna, 2019).

Current perspectives on dissonance theory

Action-based model

Today, the most prominent version of dissonance theory is the action-based model of cognitive dissonance (Harmon-Jones et al., 2009). It retains Festinger’s (1957) original formulation but adds an explanation of why people experience cognitive dissonance – a question Festinger did not address. Although subsequent researchers emphasized the importance of behavioral commitment for the experience of dissonance (Brehm & Cohen, 1962), the question of why dissonance is experienced has remained open. The action-based model draws on the notion of cognitions and perceptions as being action oriented. This perspective implies that cognition is closely tied to sensorimotor abilities, and that cognition and action is the output of the dynamic interplay between agent and environment (see Smith & Semin, 2004; 2007 on situated cognition). In essence, the action-based model suggests that cognitive dissonance evokes a negative affective state because it could potentially interfere with effective action. In other words, since information and knowledge are usually tied to action, any conflict within a system of information might impede action fluency and thereby cause the individual to experience an aversive state. The model further proposes that the experience of dissonance could be reduced by either alleviating the affective state (via so-called proximal motives) or restoring consonance between cognitions (distal motives). Moreover, since the action-based model adopts a functional viewpoint (cf. Kelman &
Baron, 1968), it suggests that dissonance processes are functional and adaptive – at least for the most part. I will return to these two concepts of the action-based model in the general discussion section below. In sum, this modern version of the dissonance theory not only explains why dissonance is experienced, but also connects back to the roots of the original theory proposed by Festinger (1957) through broadening the scope of the theory.

New questions and unsolved issues
Dissonance researchers have provided many important insights into the nature of conflicts between cognitions. However, new issues on central aspects of dissonance and the cognitive consistency framework as a whole still arise. One newly raised question pertaining to cognitive consistency framework is whether people have a universal need for cognitive consistency, or whether they are more concerned with having their prior expectations (about the world and themselves) fulfilled. Kruglanski et al. (2018) argue that inconsistencies themselves do not produce negative affect, but rather that the implication of new information on prior expectations regarding desirable/undesirable outcomes does. Since this thesis focuses on other aspects, I leave this issue for now, though I will return to it in the general discussion.

As for more dissonance-related issues, most research programs on cognitive dissonance have revolved around questions such as why people experience dissonance, under which conditions people change attitude, and what other reduction strategies people use. In the current thesis, I focus on two interrelated issues which have received far less attention in the literature: (a) how mental representations might influence the experience of dissonance, and how dissonance might influence mental representations, and (b) the nature of the core emotional component of dissonance detection and dissonance reduction. One of the questions addressed in this thesis is how people’s mental representations of their actions are affected in the presence of dissonance. A further question, that in dissonance research has remained unsolved for years, is how and to what extent emotions (both positive and negative) are related to attitude change. In relation to this, despite the theory’s long history and impressive generation of empirical studies, there is to date no coherent account for the dissonance-reduction process. I will propose a general model of this process. In the next sections of this thesis I will introduce the topics of mental representation of actions, appraisal theories of emotion, emotion regulation, and coping. In my view, these concepts can greatly advance cognitive dissonance theory without tampering with the original formulation and the more recent action-based model.
Mental representations

A key concept in many branches of psychology is the idea of mental representations. The notion of mental representations has its basis in the philosophy of mind, where these representations are viewed as the symbols or images of the external world that are not present at the moment. Thus, a mental representation is a re-presentation of the world as it has been presented to us. In other words, mental representations are the outer world as it is portrayed in our inner world (Hubbard, 2007; Palmer, 1978), and refers to all our perceptions: of objects, concepts, other individuals, and ourselves. The correspondence between the presented and the represented world can sometimes be rather abstract and arbitrary. As a consequence, a mental representation is not necessarily correlated with an exact and detailed resemblance of the outside world. Theories about mental representation have traditionally been based in an information processing perspective and involve notions such as (a) multiple levels of representations (e.g., Rosch et al.’s, 1976, levels of subordinate, basic, and superordinate categorization of objects) where each level has distinct properties, (b) structures vs. processes (i.e., distinguishing between the architecture(s) of the mind and the processes within the architecture(s)), and (c) mapping between structures (e.g., the mapping of information from a lower to a higher level of representation). Furthermore, theorists distinguish between different types of mental representations such as imagery, linguistic/propositional representations, production systems (mental representations related to motor skills in the procedural memory), and connectionism (neural networks focusing on global rather than local structures of neural activation) which assumes that information is distributed throughout the cognitive space (Hubbard, 2007).

As researchers in social cognition, we are primarily interested in people’s mental representations of themselves and their actions in relation to other individuals and these individuals’ actions. These are the representations that allow people to think of, for instance, hypothetical scenarios of individuals we might meet, how they will act when we meet them, what they might think, and so on. Since people vary in their mental representations of the world, they might differ dramatically in how a particular piece of information is interpreted. For example, a shy and self-conscious person might perceive friendly laughter as mockery, whereas a confident person might interpret similar laughter as an inviting gesture. Next, I will turn to a theory in social psychology that relates more directly to mental representations of actions. This will be the theoretical basis for Study I.

Action-identification theory

Vallacher and Wegner (1985; 1987; 2012) developed the action-identification theory as a way of describing the dynamic interplay between mind and action
(i.e., action control). More precisely, the theory deals with how people mentally construe their actions and act upon them, and how these construals are sometimes altered by external and internal circumstances. At the time (early 1980s), no other social psychological theory cared much about these questions, although many theories did include concepts such as goals, schemas, and values (see Vallacher & Wegner, 2012, for an historical account of the development of the theory).

Action-identification theory is based on three principles relating actions to different levels of mental representation: (1) people seek to understand actions at the most functional level of representation (i.e., the level at which they can perform the action the easiest), (2) when both a lower- and a higher-level representation is available, there is a tendency to choose the higher-level representation (because people often seek meaning in their actions), and (3) when an action cannot be performed with respect to its functional representation, there is a tendency for a lower-level representation to become functional. In other terms, people have standard representations of any given action they might undertake (principle 1). Since people are sensitive to the meaning and implications of their actions, there is an inclination to construe one’s action in terms of a higher-level representation (e.g., the meaning in the action, rather than the mechanisms; principle 2). However, more often than not, there are external (e.g., novel situations) and/or internal (e.g., insecurity) factors that might obstruct action execution. In order to regain action control, people’s mental representation about that action tends to momentarily plunge to lower-level instances (principle 3). Since people seek to give meaning to their actions, however, not before long will they move to a higher-level representation of the action. This dynamic interplay between lower- and higher-level representations of actions might lead to a new abstract meaning of an action which the individual had not considered before. This is what action-identification theory calls an emergence process. For instance, an individual asked to write a counter-attitudinal essay in a dissonance experiment might find it difficult to execute the action at a high-level representation – since the situation is unfamiliar and unsettling. Thus, a low-level representation (e.g., writing things down) might facilitate action executing. However, since people usually want to give meaning to their actions, the individual might adopt a higher-level representation of the situation when it is all over (e.g., I think I actually do agree with some aspect of the essay).

Vallacher and Wegner (1989) argued that there might be individual differences as to how abstractly-concretely people tend to represent actions in general. On the one hand, what they called low-level agents are people who are more concerned with the concrete action and the more mechanical aspects of the action execution. On the other hand, high-level agents are more concerned with the implications of their actions and think more in terms of “meaning” associated with their behavior. They further suggest that because low-level agents dwell in the lower instances of action identification, they are more (vs.
high-level agents) susceptible to new meanings of their actions when action execution is impeded or disrupted.

Mental representations in dissonance research

Festinger did not elaborate to any great extent on the nature of mental representations when putting forth his theory. While he explained the different relationships between cognitions and how mental structures might be altered in the face of cognitive dissonance, the ideas were rather vague and no formal conceptualization of mental representations was mentioned. Subsequent dissonance researchers did not elaborate much on these points either (see, e.g., Gawronski & Strack, 2004, for an exception). As Elliot Aronson (1992) reintroduced dissonance theory to the general research public, he took the opportunity to claim that many newly formed psychological theories (action-identification theory, self-verification theory, symbolic self-completion theory, self-evaluation maintenance theory, self-discrepancy theory, self-affirmation theory, self-regulation theory, and the concept of motivated reasoning) could well be explained by dissonance theory, and argued that the work they were doing could be done by one theory (i.e., dissonance theory). One of the “mini”-theories, as defined by Aronson, was action-identification theory. Vallacher (1992) responded that, although their theory did take into account the consistency principle and the fact that people think about their actions, action-identification theory went beyond dissonance theory because it concerns general control of thought and action, not dissonant situations per se. In that sense, Vallacher (1992) suggested that dissonance theory is a special case of action-identification theory, not the other way around. Furthermore, Vallacher (1992) proposed that his and Wegner’s theory could explain how people mentally represent dissonant actions, and how these situations could alter their subsequent representation of that action. For instance, as described above, Vallacher and Wegner (1987) had shown that unfamiliar, difficult, and effortful actions force the individual’s mind to lower-level instances of identification. These unfamiliar, difficult, and effortful actions could well be operationalized as those appearing in dissonant situations. While these notions by Vallacher and Wegner appeared to open up a new line of empirical research in the tradition of dissonance theory, no research program proceeded to test these ideas. In this thesis, however, I will return to Vallacher and Wegner’s notions of multiple levels of representations of one’s actions in relation to cognitive dissonance. More specifically, I will address how people’s mental representations of their actions are in general influenced by the experience of cognitive dissonance, and how this is related to attitude change in the induced-compliance paradigm.
Emotions

Philosophers have been asking questions regarding the nature of emotion ever since the dawn of human history. Question have covered topics such as what emotions are, how one emotion can be separated from another, the true function of emotions, why some people are more emotional than other, etc. Ironically, a phenomenon that seems to be so obvious for human beings in general, has been very difficult for researchers to define. Some theorists have focused on the neurobiological and physiological aspects of emotions; for instance, how the central nervous system receives and sends signals to the brain (Craig, 2002, 2009), and the nature of the subsequent automatic physiological reactions such as sweat and muscle tension (Mendes, 2009, 2016). Other theorists focus more on developmental issues such as children’s emotional development (Blair, 2002; Widen, 2013), and how the aging process influences emotions, and vice versa (Carstensen et al. 2011; Mather, 2016). In this thesis, I will focus mainly on the cognitive approach to emotion – the appraisal perspective, to be more precise. From this perspective, theorists focus on the cognitive evaluation of particular situations, and view the mental processes associated to these evaluations as the core aspect of the emergence of emotions (Moors, Ellsworth, Scherer, & Frijda, 2013). The terms emotion and affect are usually used interchangeably in dissonance research, however, it is important to differentiate between emotion and affect since they are assumed to play different roles in the dissonance experience. An affect is defined as the feeling of something being pleasant or unpleasant, and whether that feeling is arousing or calming. For instance, the sensation of warm summer rain falling on your arms and hair might feel pleasant and calming. Emotions, however, have a distinct cognitive component, in which the individual makes an assessment of the consequences of an experience, as well as potential coping possibilities (see, e.g., Scherer 2005). For instance, people may experience the emotion guilt when they have violated their long-term goals, social norms, or some other standard. Furthermore, guilt includes a clear approach motivation that directs people when making amends for their transgression. Shame, on the other hand, is associated with withdrawal and a general self-evaluation of worthlessness (see Lewis, 2016, on so-called self-conscious emotions such as embarrassment, guilt, pride and shame). The processes involved when an individual makes an assessment of a situation is depicted by appraisal theories of emotions.

Appraisal theories of emotions

Appraisal theories argue that people experience emotions only when an arousing situation is cognitively evaluated. In other words, a discrete emotion is a product of a series of different bottom-up (from affect to thought) and top-
down (from thought to affect) evaluations (Moors et al., 2013). There are several different emotion theories stemming from the appraisal framework, and they differ primarily in the details regarding which components are actually involved in the appraisal process, and the subsequent generation of emotions. For instance, the two-process model (Smith & Kirby, 2000) argues that associative processing, in which memory-based processes rapidly connect the current situation and past similar encounters, and reasoning (logical and critical thinking about the situation) work in parallel when evaluating incoming perceptual stimuli. The component process model (Scherer, 2009) suggests four levels of information processing: innate (pre-programmed reaction), learned (schematic), associative (mapping concepts to each other), and deliberative (propositional). The different information process systems are activated by continuous stimulus evaluation checks (i.e., appraisals) that assess (in a sequential fashion) four major organism-environment attributes: relevance (novelty, intrinsic pleasantness/unpleasantness, goal/need pertinence), implications (causal attribution, outcome probability, discrepancy from expectation, goal/need conduciveness/obstructiveness, urgency), coping potentials (control, power, adjustment), and norm compatibility (internal standards, external standards). Other appraisal theories have been concerned with the question of what is being evaluated rather than the process involved. Roseman (2001, 2013) holds that certain components of appraisal are more important than others for the generation of specific emotions. He argues that motivational conflicts and perception of accountability influence what specific emotion is experienced. For example, eating a full bag of candy (giving in to short-term goals, i.e., desires), while trying to follow a strict diet regimen (long-term goal), will probably lead to a feeling of disappointment due to the goal conflict and the fact that the individual is personally responsible for the behavior. Interestingly, the reasoning in Roseman’s appraisal theory resembles the rationale put forward in dissonance theory – as he emphasizes cognitive conflicts and attributions to one’s own behavior (see Abelson, 1983, who makes a similar point).

The most common current view on the emotion-generation process is that it involves a dynamic recursive process, where the quality and strength of emotions can change rapidly within any given situation – and give rise to new interpretations (cf. action-identification theory, Vallacher and Wegner, 1987; 2012). One of the appeals of the appraisal perspective is that it can account for variability in emotional reaction for the same event. The following two subsections on emotion regulation and coping are heavily influenced by this perspective on emotions (see, e.g., Gross, 2014; Lazarus, 2006). Applying the appraisal perspective to dissonance theory has the potential of advancing the theory, since it has direct implications for both the detection of dissonance and the dissonance-reduction process.
Emotion Regulation

The last twenty years have seen the birth and rapid growth of research on emotion regulation. The study of emotion regulation aims at understanding how people up- and down-regulate both positive and negative emotions. The key features of the concept of emotion regulation are (1) the activation of a goal to modify the emotion-generation process, (2) the engagement of a regulatory process (or strategy), and (3) the outcome of achieving one particular regulatory goal with one particular regulatory strategy. For instance, in an induced compliance situation, one goal could be to reduce negative emotions associated with the experience of dissonance. To achieve this goal, one could change one’s attitude in a way such that the dissonant cognitions become more aligned. The outcome of the employed regulatory strategy could be that the individual experiences more positive emotions towards the situation, since he/she managed to change their attitude towards that particular situation. The most frequently used model to understand emotion regulation is James Gross’ process model of emotion regulation (Gross, 1998, 2014; see also Koole, 2009, for an alternative conceptualization of emotion regulation). Although the process model assumes that the same process takes place whether one wishes to up- or down-regulate negative or positive emotions, I will mostly focus on the down-regulation of negative emotions in this thesis. In short, the process model suggests that there are five points in any given emotional situation in which a regulatory strategy could be employed. First, the individual could choose to avoid the situation in which a specific emotion is evoked altogether. Second, if the situation is unavoidable, the individual can try to modify the situation (e.g., leave the situation) to regulate the emotions. Third, if the modification fails to regulate emotions, the individual could deploy attention elsewhere. Fourth, certain situations require people to be more attentive and involved. In these situations, the individual could try to reappraise the situation (e.g., thinking of the positive aspects of the situation) as a way of regulating emotions. A full-blown emotional reaction (e.g., anger, anxiety, guilt, shame, etc.) might emerge if the individual does not manage to reappraise the situation. Fifth, as a last resort, the individual could modulate the response (e.g., trying to suppress the expression of the emotion). As mentioned above, different regulatory processes in any given situation will have different emotional outcomes. Thus, emotion regulation is a recursive dynamic process where one response might cause changes to the situation, which in turn sets the stage for a new appraisal and response. In the last few years, Sheppes, Scheibe, Suri, and Gross (2011) have further advanced emotion-regulation theory by showing under which conditions people choose to reappraise or distract themselves from emotional stimuli. The overall findings seem to suggest that emotional intensity, goals, and cognitive capacity all influence this process. Specifically, Sheppes et al. (2011) show that people (when looking at negatively arousing pictures) distract themselves with high-intense
stimuli (a woman bleeding from her face), but choose to reappraise when low-intense stimuli were presented (a woman displaying a distressed body posture). However, reappraisal is in fact employed when the high-intense stimuli is related to long-term goals (stimuli they might encounter again) (see Sheppes, 2014, for a review).

Recent developments show that people can be rather flexible, as they seem to vary across situations (cf. Fleeson 2004; Mischel & Shoda, 1995) in how they regulate emotions and cope with stressful events (see, e.g., Aldao, 2013; Cheng, 2001). Bonanno and Burton (2013) further argue that flexibility varies between individuals, and this flexibility is determined by three core individual differences components: sensitivity to social context (cf. Weick, 1968), repertoire of reduction strategies, and ability to monitor feedback about the efficacy of the chosen strategy. Other recent developments in emotion-regulation research have put forward models that take into account both explicit and implicit ways of dealing with emotions. The consensus among emotion-regulation researchers is that much of our regulatory processes related to affective states occur via automated responses, and thereby outside our conscious control (see, e.g., Kool, Webb & Sheeran, 2015). Braunstein, Gross, and Ochsner (2017) present a model where different regulatory strategies are modeled in a 2 x 2 space where they vary on an implicit-explicit dimension and automatic-controlled dimension. Strategies such as reappraisal, distraction, and escape are classified as explicit-controlled, whereas automatic goal pursuit and affect labeling (talking about one’s feelings) are implicit-controlled process. As for implicit-automatic strategies, they are associated with processes that are almost entirely bottom-up and with no explicit goal in mind. Braunstein et al. (2017) argue that extinction (i.e., learning via experience that conditioned stimuli are no longer associated with unconditioned stimuli) and reinforcer revaluation (i.e., learning via experience that particular stimuli associated with a specific outcome are now associated with another outcome) fall under this category. Lastly, explicit-automatic strategies are those where the individual has an explicit goal to change emotions, though the regulatory process is automatic. The prime example is the placebo effect, where the expectation that a treatment is effective will in fact influence one’s sensations (e.g., pain) – without top-down control processes. This thesis centers mostly around explicit processes (which dissonance research has traditionally also done). However, in Study III I will further elaborate on how the notion of implicit processes could advance our understanding of the dissonance-reduction process.

Lastly, the emotion-generation and the emotion-regulation processes are not always easy to distinguish. Kappas (2011), for instance, holds that because of the auto-regulatory nature of the emotion-generation process, the concept of emotion regulation is unnecessary – since it implies that emotions would never end unless a separate process takes over. For instance, the reflexive behavior of killing a spider (out of the fear of being bitten) is a behavioral response to a possible threat that is produced by an emotion-generated response.
This behavior terminates the situation and thereby the emotion – thus no emotion-regulation is needed. Gross, Sheppes, and Urry (2011) argue that although the emotion-generation process does include some regulatory properties, a non-separation approach would not be able to account for killing the spider out of discomfort rather than fear of being bitten. Furthermore, the non-separation approach would also have difficulties in explaining people’s attempt to cope with fear by overriding the impulse of killing the spider and try to approach it instead. I shall now turn to a concept closely related to emotion regulation which could shed some light on dissonance processes as well.

Coping

The concept of coping is closely linked to emotion regulation, and sometimes it can be rather difficult to set them apart (see, e.g., Aldao & Dixon, 2014, on overt emotion regulation such as drinking alcohol and seeking advice). Researchers differentiate these concepts by the timeframe in which they operate. Coping has a longer timeframe because it is related to situations where emotional resolution might not be easily achieved – that is, long-term stress (e.g., divorce, death in the family, or getting fired). In short, coping is usually defined as “efforts to prevent or diminish threat, harm and loss, or to reduce associated distress” (Carver & Connor-Smith, 2010, p. 685). It should be noted that some theorists include involuntary processes (implicit coping) in the concept of coping, whereas others exclude these processes. The most common categorization of different coping strategies is problem-focused and emotion-focused coping (Lazarus & Folkman, 1984). The former refers to strategies that tackle the problem head on and are functional only if the problem has a more or less clear solution. The latter refers to strategies that aim at reducing the emotional turmoil rather than the problem itself, and it is more functional when there is no clear solution to the problem. However, these two different types of strategies might complement each other such that one becomes more effective after implementing the other (Lazarus, 2006). For instance, it might be easier to tackle a stressful situation head on after reducing the more acute emotional reaction. Another useful grouping of coping strategies is the engaging-disengaging distinction (Skinner, Edge, Altman, & Sherwood, 2003). Engaging coping strategies refer to strategies aimed at approaching the stressor, whereas disengaging coping strategies refer to strategies aimed at avoiding the stressor. Engaging strategies include, for the most part, problem-focused strategies, but emotion-focused strategies such as acceptance and support seeking are also present. Disengaging strategies, on the other hand, are almost exclusively emotion-focused, since they involve evading emotions altogether. Typical disengaging strategies are denial and wishful thinking.

Despite the obvious connection between coping and dissonance reduction, researchers have rarely linked the two traditions and tried to synthesize the research fields. One exception is Sarnoff (1968), who made the connection
(from a psychodynamic perspective) between defense mechanisms and dissonance reduction (see also Hishinuma, 1987, for a review on this issue). Sarnoff argued that, although stemming from different sources, many dissonance reduction strategies might be rooted in more primitive psychological defense mechanisms. However, since dissonance research focused almost exclusively on the overt behavioral aspect of dissonance reduction (behavioral change and attitude change), these early ideas have unfortunately been forgotten. In my view, dissonance theory could gain much from organizing the different dissonance-reduction strategies in ways similar to those conceptualized in research on coping strategies. Although coping and dissonance reduction are different concepts, they might share important structural characteristics.

Emotions in dissonance research

The study of emotions (and affect) has been rather scattered in dissonance research. Although Festinger (1957) did describe cognitive dissonance as psychological discomfort (i.e., affect), he did not elaborate on any specific emotions related to the dissonance experience. Note that at the time, the empirical study of emotions was not particularly widespread, as behaviorism was the dominant force in psychology. Furthermore, the early dissonance studies focused on physiological reactions (Elkin & Leippe, 1986), indirect measures of arousal (Pallak & Pittman, 1972), or feelings such as tension (Zanna & Cooper, 1974). The first study actually investing the feeling of discomfort (and discrete emotions) more in depth was a study by Elliot and Devine (1994). They showed that the attitude-change effect in the classic induced-compliance paradigm was in fact related to self-reported discomfort. Later research has shown that the emotion of guilt might also be related to the experience of cognitive dissonance (Kenworthy Miller, Collins, Read, & Earleywine 2011).

Methodological and empirical issues when studying emotions in dissonance research

While there has been more attention to the study of affect and emotions in dissonance research lately, the results are ambiguous and difficult to interpret. For instance, some researchers have found a positive relationship between tension and attitude change (Zanna & Cooper, 1974), whereas others have not found any relationship between attitude change and emotions (Harmon-Jones, 2000), or have found that the attitude-change effect decreases when people are encouraged to express their feelings of anxiety and tension during the dissonant situation (Pyszczynski, Greenberg, Solomon, Sederis, & Stubing, 1993).
Thus, to date little is known about the extent to which people experience different emotions (both positive and negative) during different dissonant situations, and how these emotions relate to different reduction strategies. Furthermore, the findings by Elliot and Devine (1994) have been notoriously difficult to replicate, which has led to the suggestion that self-reported emotions (e.g., the PANAS; Watson, Clark, & Tellegen, 1988) might not be an adequate tool for the assessment of the emotional experience of dissonance (Jonas et al., 2014).

One part of the problem with using self-report questionnaires could be that researchers have tended to ask participants how they feel at the moment when they state their emotions. A problem with this phrasing is that participants might confuse the question with mood or general emotionality – or with the dissonant situation. These multiple interpretations of the question might lead to much error variance. From the perspective of appraisals, it might be wiser to ask participants to state their emotion in relation to the actual dissonant situation (e.g., to what extent did you experience these emotions during the writing of the essay). This would reduce ambiguity regarding how participants interpret the question, and the reporting of emotions will mostly be impeded by people’s introspective ability. Furthermore, from the perspective of emotion regulation, it is reasonable to assume that the initial affective reaction (e.g., discomfort) to the dissonant situation, as a result of reappraisal (for example in terms of attitude change) is diminished during the procedure of the experiment (e.g., writing a counter-attitudinal essay in the induced compliance paradigm).

Given the assumption of emotion regulation, several different emotional outcomes of the dissonance experience seem possible. First, when participants are asked about emotions after writing the essay, regulatory processes might have prevented the emergence of full-blown negative emotions. Moreover, if attitude change does take place, this could indicate a favorable appraisal of the situation – since attitude change indicates that the individual now agrees with the content of the essay. This in turn may lead individuals to feel more positive emotions towards the situation, and one should find a positive relationship between positive emotions and attitude change. Thus, although cognitive dissonance does evoke a feeling of discomfort, it does not necessarily mean that discomfort will be positively related to attitude change. Hence, given the dynamics of appraisals and emotion regulation, emotions in a dissonance research context may be more complex than earlier researchers have assumed. These ideas will be empirically explored in Study II.
An encompassing dissonance model based on a cognitive-emotion perspective

To date, there is no general account for how emotions are related to the dissonance processes (detection and reduction). I believe that conceptualizing these dissonance processes within a broader cognitive-emotional perspective might resolve some of the past issues, and that this will possibly be an initial step towards a more unified account for these processes. The advantage of a broader cognitive-emotion perspective is that it can account for variability in emotional experience to a dissonant situation, and variability in conflict resolution. For instance, in a dissonant situation (e.g., in the induced compliance paradigm) one individual might get angry and then bolster the original attitude, whereas another person might only get a little annoyed and then trivialize the situation. Below, I present some ideas on how to fuse the emotion-generation and emotion-regulation process with the detection of dissonance and the reduction process (cf. Gross et al.’s, 2011 integration approach to emotion generation and regulation).

Dissonance processes: a proposal of appraisal, emotion regulation, and coping

In accordance with the reasoning of appraisal theories of emotion, and the notion of emotion regulation, any given dissonant situation will entail information processing at different levels of awareness and will include a variety of different dissonance-reduction strategies. Similar to coping strategies, dissonance-strategies can be classified along a disengaging-engaging continuum. Below, I will offer a more detailed proposal of a broad cognitive-emotion perspective on dissonance processes.

Once a dissonant situation is detected, it could be assumed that the initial affective intensity will dictate how people reduce dissonance (cf. Sheppes, 2014). The intensity is most likely influenced by the magnitude of dissonance (i.e., all dissonant cognitions / all dissonant cognitions + all consonant cognitions), but also by the novelty-familiarity dimension of the specific situation (cf. component process model). For instance, if the magnitude of dissonance is low and the situation is highly familiar, the situation will be dealt with quickly (e.g., a person holding low to moderate environmental values accidentally throwing garage in the wrong recycling bin). This process occurs most likely outside of people’s awareness – or at least at the boundary of conscious awareness (cf. associative processing), and at the boundary between emotion-generation and emotion regulation (cf. auto-regulatory properties of the emotion-generation process). If the situation is highly dissonant (after the individual has assessed likely implications), people might disengage early in the process through distraction or by physically leaving the situation. This is most likely when people feel that their coping potentials are poor, or the situation has no clear solution (cf. emotion-based coping). Note, however, that
this disengagement could occur via schematic processing and thereby outside of people’s awareness (e.g., unconsciously choosing to avoid certain situations).

When people perceive that the conflict is related to long-term goals (e.g., self-standards), they might elaborate more on the situation. Here, motivation and cognitive capacity should play a central role (cf. Kelman & Baron, 1968; Sheppes, 2014). Cognitive capacity can be defined as (a) people’s repertoire of dissonance-reduction strategies (similar to emotion-regulation repertoire; Gross, 2014), and (b) their temporary capacity. For instance, an individual might start off with a particular strategy in mind (e.g., reappraisal) but realize that he/she is too cognitively exhausted to engage further and decide to distract him/herself instead (see, e.g., Brehm & Cohen, 1962, on uncommitting from dissonant situations). In line with suggestions by Bonanno and Burton (2013), people might differ their usage of reduction strategies. In one occasion, an individual might trivialize a behavior-attitude discrepancy, whereas on another (but similar) occasion, the individual might align the dissonant cognition via attitude change. This flexibility is believed to be caused by both internal (repertoire of reduction strategies) and external (social context) factors. This is also in accordance with researchers (e.g., Weick, 1968) who argue that the social context in which dissonance is experienced might have a considerable impact on the dissonance-reduction process (cf. Smith and Semin, 2004, 2007, on situation cognition, and Koole & Veenstra, 2015, for an application of this approach to emotion regulation). Finally, specific reduction strategies could be conceptualized as similar to coping strategies (e.g., disengaging-engaging). For instance, since attitude change implies approach towards the situation, it would be classified as an engaging strategy. Trivialization, however, would be classified as disengaging, since it implies reducing the importance of the situation.

In sum, the power of this broad cognitive-emotion perspective is the emphasis on different levels of information processing, the dynamics of top-down and bottom-up effects, and the synchronization of multiple appraisals in the emotion-generation and emotion-regulation process. This can account for the detection of implicit cognitive inconsistencies, and how implicit memory processes might affect the interpretation of the situation (e.g., situations one has dealt with before will not be appraised as bad as the first time). This perspective can also account for the variability in the employment of dissonance-reduction strategies both within and between individuals. Based on this broad cognitive-emotion perspective, in Study III I will present a general dissonance-reduction model which aims to reconcile past accounts of dissonance reduction.
Aims

Cognitive dissonance theory has been heavily studied, and also challenged, since it was first proposed by Festinger in the late 1950s. The development of the theory was for a long time focused on reformulations that revolved around the question of which circumstances led people to change attitude. This was first lamented in the 1980s by Robert Abelson (1983), who discussed the lack of progress on what he thought would be a powerful framework for understanding a vast amount of human thought, emotion, and behavior (see also McGuire, 1968). The last decade has seen a revival of the view of cognitive consistency as a fundamental principle of human psychology (Gawronski & Strack, 2012), and dissonance theory as a general theory of social psychology – not a theory about attitude change (Gawronski, 2012; Harmon-Jones et al., 2009).

This thesis aims to further infuse the theory and thinking of cognitive dissonance by relating the process involved in dissonance detection and reduction to neighboring theories and concepts. The overarching purpose of this is to synthesize some concepts and theories closely related to dissonance theory in order to describe the big picture and expand dissonance theory. One way in which to do this is to relate dissonance theory and action-identification theory, since, according to the action-based model, dissonance is experienced because conflicts can obstruct effective action. Another way of developing the theory is to revisit the core emotional component and applying a modern emotion and emotion regulation/coping perspective to understand how dissonance relates to emotions. Furthermore, a modern emotion and emotion regulation/coping perspective is applied to understand the dissonance-reduction process in general. More specifically, the aims of this thesis are to:

(i) as an overarching purpose, infuse dissonance theory with other relevant theories in social cognition and emotion psychology.

(ii) investigate how the mental construal of one’s actions is altered when experiencing cognitive dissonance (Study I);

(iii) investigate the relationship between emotions (positive and negative) experienced during a dissonant behavior and the subsequent dissonance reduction (Study II);
(iv) analyze past accounts of dissonance reduction via a broad cognitive-emotion perspective, and present a general model of dissonance reduction to reconcile past accounts (Study III).
Studies

Study I: Dissonance and abstraction: cognitive dissonance leads to higher level of construal

Background
In dissonance research, there has been almost no focus on how dissonance affects people’s mental representation about the dissonant situation, and how dissonance influences mental representations of their actions in general. According to action-identification theory (Vallacher & Wegner, 1987; 2012), situations that are ambiguous, unfamiliar, or disruptive (like dissonant situations) force mental representations to momentarily plunge to lower levels. This momentary dive to lower-level representations opens space for higher-level construals (or interpretations) of the situation – since people usually seek to find meaning in their actions. Action-identification theory further suggests that there are individual differences in how much people are mentally affected by disruptive (or dissonant) situations (Vallacher & Wegner, 1989). Because low-level agents (people who are prone to mentally represent their actions in more concrete terms, i.e., lower-level representations) usually approach situations with less meaning-based representations in their minds, they might be more sensitive to new interpretations of actions when these actions are disrupted or ambiguous. In contrast, high-level agents (people who are prone to mentally represent their actions in abstract terms, i.e., higher-level representations) are chronically concerned with the meaning of their actions, and this enables them to conserve a stable construal of actions even in the face of unfamiliar and ambiguous situations. Given the premise of action-identification theory, it was hypothesized that those individuals in an induced-compliance paradigm who experience most dissonance would activate a more abstract mindset than those experiencing less dissonance. However, this effect should be most pronounced for low-level agents.

Method

Participants. We recruited 145 non-psychology students (mean age = 23.88 years, SD = 4.47, 107 women), and they all received movie vouchers for their
participation. The final analysis consisted of 125 participants since 16 participants were excluded for having indicated a positive attitude toward the target-issue in the pretest (a score of 5 or higher). Four additional participants were excluded for having failed to follow instructions (e.g., writing strongly against the target-issue).

Procedure and materials. In this experiment, the induced-compliance paradigm was employed. All participants received an online survey where they first completed some questions regarding university issues – including the target-issue. The target issue asked for students’ opinion on the proposal of reducing student aid for every failed exam (1 = fully disagree; 9 = fully agree). Since the induced-compliance paradigm typically requires people to hold a negative attitude towards whatever target issue one chooses to use, all participants scoring at the midpoint of the scale or above were excluded. After stating their attitude on the target issue, they were asked to complete the preference for consistency scale (Cialdini, Trost, & Newsom, 1995). This scale was used to control for individual differences in the attitude-change effect. Lastly, participants completed the gestalt completion test (Ekstrom, French, Harman, & Dermen, 1976). The test consists of drawings that are composed of black blotches representing parts of an object. The task is to describe each object as specifically as possible. This test was used to assess individual default levels of abstraction, as research has found that people with a cognitive style characterized by perceiving information and situations in terms of “the big picture” (similar to so-called high-level agents), rather than specific details, perform better (Rawal & Wilson, 2005).

Approximately two weeks after the online survey, participants arrived at the lab and were allocated into one of three different conditions; in the neutral condition, they were simply asked to write a short essay on their own opinion regarding the student aid proposal (i.e., the target issue). Here, no dissonance is supposed to be evoked since participants will most likely write something in line with their initial attitude. In the low-choice condition, they were told to write in favor of the proposal as a part of the study. Thus, producing little dissonance since participants can attribute their counter-attitudinal behavior to an external cause (i.e., the requirements of the experiment). In the high-choice cognition (which is supposed to produce the most dissonance), they were asked to freely write in favor of the proposal since we had already received many counter-proposal essays. Since there are few external causes one can attribute to one’s counter-attitudinal behavior, people tend to experience most dissonance in this condition.

After writing the essay, to measure positive and negative emotions, participants were asked to complete a modified version of the PANAS (Watson et al., 1988). Specific emotions was not analyzed – only the compound of positive and negative emotions, and discomfort. Overall, no difference between
conditions was found on this measure. After the PANAS, they received a questionnaire containing the same question regarding the target-issue as in the online survey. Lastly, they received the behavioral identification form (Vallercher & Wegner, 1989) to measure their level of abstract mindset after the manipulation.

Results and discussion

Attitude change

First, an ANCOVA (controlling for preference for consistency) revealed a significant main effect of experimental condition, $F(3, 121) = 3.55, p = .032, \eta^2 = .06$. Pairwise comparisons revealed that participants in the high-choice condition changed their attitudes significantly more than participants in both the low-choice condition ($p = .035, d = .43$), and the neutral condition ($p = .027, d = .46$). Moreover, three separate one-sample t-tests revealed a significant change in attitude from the pre-test to the experiment for participants in the high-choice ($p = .003, d = .49$), but not those in the low-choice or neutral condition. Overall, these results show that the attitude-change effect was obtained in this experiment.

Abstraction

A hierarchical regression analysis was performed to test the hypothesis that participants in the high-choice condition would exhibit a more abstract mindset, that is, show higher scores on the behavioral identification form, compared to the other conditions, and that this effect would be strongest for those scoring low on the gestalt completion test, that is, low-level agents. The first regression model was significant, $F(3, 121) = 2.73, p = .047, R^2 = .06$, and showed that participants in the high-choice condition exhibited a more abstract mindset compared to both the neutral and low-choice condition. The second model was also significant and revealed an interaction effect between condition and gestalt completion test, ($p = .04, \Delta R^2 = .05$), $F(5, 119) = 2.98, p = .014, R^2 = .11$. Simple slopes analysis revealed, as predicted, that participants scoring low (−1 SD) on the gestalt completion test (low-level agents) exhibited a more abstract mindset in the high-choice condition compared to those in the neutral condition, and to those in the low-choice condition. No differences were found between conditions when testing simple slopes for those scoring high (+1 SD) on the gestalt completion test (high-level agents). Furthermore, results revealed a significant relationship between attitude change and the behavioral identification form (i.e., abstract mindset) in the high-choice condition ($r = .415, p = .006$). Taken together, these results support the hypotheses that (a) dissonance activates an abstract mindset, and (b) especially among participants identified as low-level agents. Also, the attitude-change effect and the
increased abstraction seems to be related. The overall results should, however, be taken with caution since this was a one-experiment study and the effect sizes were medium-sized at best.

Conclusion
Overall, this study supports the connection between dissonance theory and action-identification theory as suggested by Vallacher (1992). More precisely, results revealed that general action identifications are in fact altered by dissonant situations. And the fact that attitude change was correlated with the behavioral identification form indicates that the attitude-change effect might intrinsically be an abstraction process. However, whether the abstraction assists the attitude-change effect or is activated independently (or both), is difficult to say from these results. Future research should try to disentangle these effects since they could shed some well-needed light on the dissonance-reduction process in general.

Study II: Dissonance reduction as emotion regulation: attitude change is related to positive emotions in the induced-compliance paradigm

Background
An unresolved issue in dissonance research is to what extent, and in what way, the emotional reaction during the dissonance experience is related to the attitude-change effect. Some studies have found a positive relationship between the feeling of tension and attitude change (Zanna & Cooper, 1974), and others found that individuals who were encouraged to acknowledge their feelings of anxiety and tension during the cognitive conflict exhibited less attitude change (Pyszczynski et al., 1993). Other researchers have failed to find any relationship between emotional reactions and attitude change (e.g., Harmon-Jones, 2000). One possible reason for the conflicting findings in past research is that participants have been asked, after the dissonant manipulation, to indicate what they feel at the moment, rather than being asked to assess their emotions in relation to the dissonant situation. Since researchers want to understand to what extent people experience different emotions specifically related to the conflict, the latter phrasing is to be preferred. Furthermore, while the initial reaction to a dissonant situation might produce negative arousal, a full-blown emotion does not emerge until further cognitive elaboration is carried out. During this cognitive elaboration, the individual might be able to halt the development of a negative emotion by re-interpreting the situation. A successful regulation of the affective state might even lead to positive emotions towards
the situation. Given this premise, in the second study of this thesis it was hypothesized that attitude change (a form of reappraisal) will be positively related to positive emotions – and inversely related to negative emotions.

Experiment 1

Method

Participants. Forty-eight undergraduate psychology students (mean age = 25.05, SD = 3.90, 75 percent women) were recruited and received course credits for their participation. Three participants were excluded for not following instructions, and one had already participated in a similar study. Thus, the final sample consisted of forty-four participants.

Procedure and materials. As in Study 1, the induced-compliance paradigm was employed to test our hypothesis. The target issue in this study was people’s attitude towards animal testing. Studies show that young adults living in urban areas (e.g., university students) generally hold negative attitudes towards animal testing. Participants were asked (online) to freely write an essay on the benefits of reducing regulations on animal testing in order for researchers to perform more testing and less paperwork. Next, participants were asked to indicate, on a modified version of the PANAS, to what extent they experienced different positive (e.g., joy, optimism, hope, excitement) and negative (e.g., anger, anxiety, frustration, discomfort) emotions during the writing of the essay. As in Study 1, the effect of specific emotions was not analyzed for this experiment – only the compound factors of positive and negative emotions. Lastly, participants were asked to respond (on an 8-point scale) to the following questions: (1) What is your opinion regarding the proposal on extended animal testing? (2) What do you think other people’s opinion is on the proposal on extended animal testing? (3) How difficult was it to write the essay? The question regarding their attitude towards animal testing was the main dependent variable, and the other two questions were used as control questions. The main predictors of the attitude towards animal testing were positive and negative emotions experienced while writing the essay.

Results and discussion
In order to investigate whether attitude change regarding animal testing was related to more positive emotions and to less negative emotions, a linear regression analysis was performed with positive and negative emotions as predictors and attitude towards animal testing as dependent measure. Results revealed (as predicted) that participants’ attitude towards animal testing was
positively related to positive emotions $\beta = .30$ [CI 95% .03, .58], $t(2, 41) = 2.21$, $p = .03$, and inversely related to negative emotions $\beta = -.38$ [CI 95% -.66, -.10], $t(2, 41) = 2.73$, $p = .01$. What participants believed regarding other’s opinion, and how difficult they experienced the task, did not affect the results. A clear relationship between emotions (positive and negative) and attitude change was found in this experiment. However, since no pre-measure of the attitude towards animal testing was included, it could not be concluded that there was an actual change in attitudes. In the next experiment, we aimed at conceptually replicating the results with a study conducted in the lab and with a different version of the induced-compliance paradigm.

Experiment 2

Method

Participants. We recruited 127 university students (mean age = 25.47 years, SD = 6.39, 65 percent women), who received movie vouchers for their participation. Eleven participants who indicated a positive attitude toward the proposition in the pretest (a score of 4 or higher on an 8-point scale) were excluded, and an additional eight participants who failed to follow instructions (e.g., writing strongly against the proposition) were excluded. Finally, one participant was excluded for not completing the final part of the experiment, and another for having participated in a similar study before. In total, 106 participants were included in the analysis.

Procedure and materials. In this experiment, the induced-compliance paradigm was again employed, however in this experiment the target issue was the same as in Study I (the student aid proposal). This time, the attitude towards the target issue and emotions (positive and negative) were measured on three different occasions: (1) approximately a week before the dissonance induction; (2) directly after the dissonance induction; and (3) approximately a week after the dissonance induction. In part 1, approximately one week before the induction of dissonance, participants were first asked to complete the PANAS. In this version, (measuring their baseline emotionality) they were asked to indicate how strongly they experienced the emotions at the moment (0 = not at all; 7 = very much). Next, they were asked to state their opinion (0 = completely disagree; 7 = completely agree) on five different issues regarding their university, and how important each issue was to them (0 = not at all; 7 = very much). The target issue was the same as in Study I. In part 2, the dissonance induction, participants arrived at the lab and were asked if they wanted to participate in a survey regarding different student issues at the university. All agreed to participate and were given an envelope with the information about
the survey and a sheet of paper to write on (see Study I). Hence, this emulated the high-choice condition of Study 1. After writing the counter-attitudinal essay, participants were asked to complete the PANAS (the same as in part 1), but in this version they were asked to indicate to what extent they had experienced the emotions during the writing of the essay. After completing the PANAS, participants were asked to indicate their opinion regarding the target issue again (same measures as in part 1). In part 3 (the final part), approximately one week after the dissonance induction, participants received an online survey where they were asked once again to complete the PANAS (same version as in part 1), and to indicate their opinion regarding the target issue and the importance thereof.

Results and discussion

Attitude change (and trivialization)
An initial paired samples t-test (attitude from part 2 vs. attitude from part 1) revealed an overall attitude-change effect, \( t(1, 105) = 5.30, p < .001, d = .55 \), and a second paired samples t-test (attitude from part 3 vs. attitude from part 1) revealed that the effect was almost identical a week after, \( t(1, 105) = 4.49, p < .001, d = .50 \). Lastly, a third paired samples t-test (attitude from part 3 vs. attitude from part 2) revealed no difference between the attitude measure directly after the induction and one week later. Thus, the attitude-change effect was rather stable after one week. A closer investigation of the data reveals an equally large trivialization effect. A paired samples t-test (importance of attitude from part 2 vs. importance of attitude from part 1) revealed an overall trivialization effect, \( t(1, 105) = 5.77, p < .001, d = .66 \). Similar to the attitude-change effect, a second paired samples t-test (importance of attitude from part 3 vs. importance of attitude from part 1) revealed that the effect was stable over the course of one week, \( t(1, 105) = 5.20, p < .001, d = .55 \), and no difference was found between part 2 and 3. This trivialization effect highlights the importance of not overemphasizing attitude change in dissonance research (cf. Devine et al., 1999), as there are many ways in which people can reduce dissonance – an issue I will return to in Study III. Note that the results from the trivialization effect were not published in the original study (Cancino-Montecinos, Björklund, & Lindholm, 2018) since in that study the focus was exclusively on attitude change.

Attitude change and emotions
In order to investigate the relationship between attitude change and emotions experienced during the experiment, an initial hierarchical linear regression analysis was conducted with attitude change (difference between attitude measure at part 1 and 2) as dependent measure, and with the following as predictors: positive and negative baseline emotions in model 1, and positive and
negative emotions experienced during the essay in model 2. Results revealed (as predicted) that positive emotions experienced during the writing of the essay were positively related to attitude change $\beta = .45$ [CI 95% .27, .64], $t(4, 101) = 4.95, p < .001$, and negative emotions were inversely related to attitude change, $\beta = -.22$ [CI 95% -.40, -.04], $t(4, 101) = -2.45, p = .016$. Baseline emotions were not related to attitude change and did not influence the relationship between emotions experienced during the essay and attitude change.

In order to investigate whether the relationship between attitude change and emotions remained one week after the manipulation, a second hierarchical linear regression analysis was conducted with attitude change (difference between attitude measure at part 1 and 3) as dependent measure, and with the following as predictors: positive and negative baseline emotions from part 1 in model 1, positive and negative emotions experienced during the essay (part 2) in model 2, and positive and negative baseline emotions from part 3 in model 3. Results revealed that positive emotions experienced during the writing of the essay were still positively related to attitude change $\beta = .36$ [CI 95% .16, .56], $t(4, 101) = 3.60, p < .001$, but not negative emotions ($\beta = -.16$ [CI 95% -.36, .03], $t(4, 101) = -1.64, p = .10$), although the relationship was in the predicted direction.

In sum, these results corroborated the findings of the first experiment and additionally showed that the relationship between positive emotions experienced during the writing of the essay and attitude change remained practically the same one week after the induction.

Conclusion
Across two experiments, including different versions of the induced-compliance paradigm, this study showed the importance of asking individuals to relate their emotions to the specific dissonant behavior. In other words, it is important to apply an appraisal and emotion regulation perspective to understand the dynamic cognitive and emotional changes occurring in this experimental procedure. This minor change revealed some important results and implications for the further theoretical development of dissonance theory – especially the dissonance-reduction process.
Study III: A general model of dissonance reduction: unifying past accounts via a broad cognitive-emotion perspective

Background
Festinger (1957) stated that there are three major ways in which people might reduce dissonance (see Introduction). While he added that many factors could influence the dissonance-reduction process, he was somewhat vague on the specifics of this rather complex psychological process. To date, we still lack a general model of dissonance reduction (see, e.g., McGrath, 2017; Vaidis, 2018, on this issue). A problem for the understanding of dissonance reduction is that many isolated studies each present a limited view on dissonance reduction (e.g., Gosling et al., 2006; Götz-Marchand, Götz, & Irle, 1974; Joule & Martinie, 2008; Leippe & Eisenstadt, 1994, 1999; Simon et al. 1995). Furthermore, since the many revisions of dissonance theory (self-consistency and self-affirmation account of cognitive dissonance, and the New Look Model) hold different views on the dissonance-reduction process, it has been somewhat difficult to put forth a general account for dissonance reduction. Conceptualizing dissonance processes in terms of appraisals, emotion regulation, and coping might clarify many of the past issues – and facilitate the development of a general model of dissonance reduction.

A general model of dissonance reduction
From the notion of cognitive appraisals, emotion regulation, and coping, a broad general model was suggested as an attempt to unify past accounts of dissonance reduction (see Figure 1). In line with Festinger’s original formulation of dissonance theory, the general premise in Study III is that whenever an individual detects a cognitive conflict, an aversive feeling will arise regardless of consequences for the individual, and regardless of the type of dissonant situation. This aversive feeling motivates the individual to either reduce the feeling by focusing on reducing and/or preventing the further development of emotions, or by trying to deal with the actual cognitive conflict. Given that all previous accounts of dissonance reduction, including the major reformulations, hold that dissonance reduction is an emotionally motivated process, this basic premise of the model suggests that applying a cognitive-emotion perspective on dissonance reduction provides the most general framework with which to understand these processes – key to the general model presented here is the pluralistic view of dissonance reduction. That is, the model suggests that, within the same dissonant situation, people might differ considerably in their emotional reaction to the situation and their use of dissonance-reduction strategies.
Figure 1. A general model of dissonance reduction.
The model is divided into a primary reduction stage, a secondary reduction stage, and the strategy employment stage (not to be confused with the three-stage model presented by other researchers, e.g., Gawronski, Peters, & Strack, 2008). At the primary stage, the initial emotional intensity determines the subsequent reduction process. The intensity is influenced by the magnitude of dissonance and the novelty-familiarity dimension. For instance, when the magnitude of dissonance is low and the situation is highly familiar, the reduction of dissonance most likely occurs outside of people’s awareness (cf. implicit emotion regulation and schematic/associative processing). When the situation is perceived as too dissonant, people will disengage quite early in the process and proceed directly to the strategy-employment stage – thus without going through the secondary reduction stage. However, if the individual is motivated (i.e., consideration of long-term goals in relation to short-term goals) and has sufficient cognitive capacity (i.e., repertoire of dissonance-reduction strategies and current cognitive resources), he/she will engage more in the situation and thereby enter the secondary stage – which involves more engaging strategies. A continuous feedback loop, however, connects the secondary and primary reduction stage. This recursive feature of the dissonance-reduction process means that people can always disengage from the situation despite having already initiated a more elaborate reduction process – if they realize, for instance, that they did not have the cognitive capacity to deal with the situation. Thus, the dissonance-reduction process is sometimes a rather dynamic process where appraisals might go back and forth several times before the individual finds a state of consonance. Interestingly, the overall dissonance-reduction process might render the appraisal of the situation (and thereby the emotion) completely different from the initial affective reaction related to the initial interpretation of the situation (cf. Study II). Note also that the social context is constantly affecting the experience and the reduction of dissonance (cf. Koole & Veenstra, 2015, on a situated cognition approach to emotion regulation). For instance, an individual might feel more guilt after violating a standard (value or attitude), and might try harder to make amends, when this occurs in front of people that hold the same standard (vs. in front of people that do not care about the standard). Finally, the model assumes that dissonance-reduction strategies vary along a disengaging-engaging continuum (cf. coping strategies). Disengaging strategies (e.g., distraction) occur before any deeper cognitive elaboration, whereas engaging strategies (e.g., attitude change) occur after the cognitive elaboration.

Specific emotions and dissonance reduction
The experience of dissonance is usually defined as a feeling of discomfort (Elliot & Devine, 1994; Festinger 1957). Recently, researchers have found that guilt seems to be the emotion that best characterizes the dissonance experience (Kenworthy et al., 2011). I believe, based on the variability of different
appraisals and reduction attempts that can possibly occur in one single situation, that this discussion needs to be more nuanced. Although the initial feeling of dissonance might be classified as discomfort, the generated emotion will depend on how a particular individual appraises the situation (see Table 1). For example, if the individual feels that the dissonant situation was brought upon him/her, the initial discomfort might evolve into anger.

Table 1. *Specific emotions associated with specific reduction strategies.*

<table>
<thead>
<tr>
<th>Emotion experienced during dissonance</th>
<th>Dissonance-reduction strategy</th>
<th>Emotional outcome after success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger</td>
<td>Attitude bolstering</td>
<td>Satisfaction</td>
</tr>
<tr>
<td>Irritation</td>
<td>Denial of responsibility</td>
<td>Relief</td>
</tr>
<tr>
<td>Anxiety/Fear</td>
<td>Avoidance</td>
<td>Relief</td>
</tr>
<tr>
<td></td>
<td>Denial of information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forgetting</td>
<td></td>
</tr>
<tr>
<td>Guilt</td>
<td>Behavioral change</td>
<td>Serenity</td>
</tr>
<tr>
<td>Shame</td>
<td>Distraction</td>
<td>Sadness</td>
</tr>
<tr>
<td></td>
<td>Escape</td>
<td></td>
</tr>
</tbody>
</table>

Since this is an approach-motivated emotion, the individual will quickly try to find the external source and extinguish it. Due to the dynamic nature of appraisals (and thereby emotions), the resulting emotion (if the extinguishing is successful) might be characterized as satisfaction. Anxiety/fear is likely to evolve when the individual is overwhelmed by the situation. Since these emotions are avoidance motivated (LaBar, 2016), they are related to strategies such as avoidance, escape, and distraction (disengaging strategies). In dissonant situations where there is a clear violation of values or important attitudes, self-conscious emotions such as guilt and shame are likely to evolve (cf. Lewis, 2016). The difference between guilt and shame is that guilt is followed by a corrective response (making amends for transgression) coupled with a feeling of serenity if the corrective attempt is successful. Shame, however, is expected when the individual has little to no chance of compensating for the serious transgression. This leads to retreat (escape or distraction) rather than approach (behavioral change) – and possibly a prolonged sense of sadness.
Overall, these examples indicate that a more nuanced discussion about the experience of dissonance and following emotions is warranted. The dissonance-reduction process is not related to one emotion, but rather a set of emotions, from the initial appraisal to the final assessment of the situation, and the renewed emotional experience followed from that final assessment.

Demonstration of the feasibility of the framework

As a way of demonstrating that the pluralistic approach to emotional reactions and reduction strategies is worthwhile pursuing, data from the second experiment of Study II was reanalyzed. First, the prevalence of different emotional reactions (results from the PANAS after the dissonance manipulation) was investigated via a factor analysis. The results revealed three factors for negative emotions and one overall factor for positive emotions. The negative emotion factors consisted of an Anger factor (anger, frustration, hostility, irritation), an Anxiety/Fear factor (anxiety, fear, nervousness), and a Self-conscious factor (guilt, shame). Thus, this reveals that people can react with different emotions to cognitive dissonance.

In Study 2 both pre- and post-measures were included. Hence, when analyzing the prevalence of different reduction strategies, we could assess whether participants (1) changed attitude, (2) maintained the original attitude, or (3) strengthened the original attitude (attitude bolstering), and whether they (1) decreased the importance of the attitude (trivialize), (2) maintained the original importance of the attitude, or (3) strengthened the importance of the attitude (importance bolstering). These potential outcomes result in a 3x3 matrix of possibilities: (1) Attitude change only; (2) Attitude bolstering only; (3) Trivialization only; (4) Importance bolstering only; (5) Attitude change and Trivialization; (6) Attitude change and Importance bolstering; (7) Attitude bolstering and Trivialization; (8) Attitude bolstering and Importance bolstering; and (9) No strategy. Results revealed that all possible outcomes were obtained in one single dissonant situation.

In sum, as suggested by the general model of dissonance reduction, these results reveal that people’s emotional reaction to a dissonant situation can differ, as well as their choice of reduction strategy.

Future developments

The aim was to present a broad model that transcends any specific experimental paradigm and specific reduction strategy. However, some important elements may need to be added. First, research on executive functions such as mental shifting and working memory capacity (Miyake & Friedman, 2012) might shed some light on people’s overall reduction repertoire (see, e.g., Hofmann, Schmeichel, & Baddeley, 2012; Schmeichel & Tang, 2015). Second,
factors such as self-efficacy in emotion regulation (Caprara, Di Giunta, Eisenberg, Gerbino, Pastorelli, & Tramontana, 2008) and/or individuals’ implicit theories about emotion regulation (Kappes & Schikowski, 2013; Tamir, John, Srivastava, & Gross, 2007) might also influence the level of engagement in dissonance-reduction attempts.

Conclusions
In essence, Study III suggests the usefulness of applying a broader cognitive-emotion perspective on the dissonance-reduction process. The proposed general dissonance-reduction model transcends any specific experimental paradigm and reduction strategy previously presented by researchers.
General discussion

At first glance the studies of this thesis seem rather disconnected from each other. One of the studies is concerned with the relationship between the detection of dissonance and an abstract mindset, while another deals with the relationship between emotions and attitude change. Finally, the third study tries to reconcile the many different accounts of dissonance reduction into one model. However, common to these studies is that all three constitute attempts to incorporate dissonance theory into neighboring concepts and theories. This thesis argues that there are still many aspects of the dissonance experience to delineate. I will discuss some of these in more depth here. First, in relation to the studies presented in this thesis, I will discuss: (a) the connection between cognitive conflicts and abstraction; (b) the relationship between emotions and attitude change; and (c) the function and adaptiveness of dissonance processes. Second, I will address some broader issues within the framework of cognitive consistency in general.

Connection between dissonance and abstraction: a matter of perspective.

Results from Study I suggest that there is a relationship between experiencing cognitive conflict (or dissonance) and exhibiting an increased abstract mindset. It was briefly argued that this connection might stem from the fact that the attitude-change effect is inherently an abstraction process. However, I would argue that an abstract mindset might be activated for several different reasons. It might be activated as an inherent part of the attitude-change process – since accommodating a new piece of information into the existing cognitive structure entails adopting a new perspective. Abstraction might also be activated in order to see the “big picture” and better understand the situation without necessarily changing attitude (i.e., transcendence; Abelson, 1959). Lastly, an abstract mindset (unrelated to the conflict) might be activated implicitly as a way of reducing negative affect related to the cognitive conflict. Below I will discuss these different possibilities by comparing the connection between cognitive conflict and abstraction from different viewpoints. In this section I will focus mostly the unrelated kind of abstraction.
The possible relationship between cognitive conflicts and abstraction has also been discussed from the perspective of the meaning maintenance model (Heine, Proulx, & Vohs, 2006; Proulx & Inzlicht, 2012). This theory is based on the notion that people feel meaninglessness when experiencing cognitive conflicts characterized by basic assumptions of reality being challenged. These types of cognitive conflicts are called expectancy violations. Examples of such expectancy violation manipulations are having people watch or read surreal and absurd fictional materials (e.g., watching David Lynch’s surreal short film Rabbits, or reading passages from Franz Kafka; see e.g., Proulx & Heine, 2009). A key assumption of the meaning maintenance model is that people seek to first and foremost reduce the negative affect (i.e., meaninglessness) related to these violations. These attempts to reduce negative affect are palliative, meaning that they simply reduce the symptoms but not the cause. Note that this assumption differs from the account of dissonance reduction in Study III, which states that some reduction strategies might focus on targeting the emotion whereas other strategies aim at resolving the cognitions. The notion of palliative attempts to reduce negative affect leads to the idea of fluid compensation, which means that people, as a way of reducing negative affect, can reaffirm aspects of reality or belief systems completely unrelated to the aspect being violated. Thus, people may use whatever reduction strategy in whatever situation. For instance, when experiencing meaninglessness about a specific domain in life (e.g., current job), one can reduce this feeling by reflecting on a psychologically safe but unrelated domain in life (e.g., the beauty of mathematics in describing the natural world). Note that proponents of meaning maintenance model argue that the notion of fluid compensation can be generalized to all types of cognitive conflicts – including those studied in typical dissonance experiments (see Proulx & Inzlicht, 2012). I would agree with notion of fluid compensation in typical dissonance experiments to the point that people might engage in self-affirmation to reduce negative affect in these experiments. However, I would not hold the notion fluid compensation as a key principle of dissonance reduction.

According to the proponents of the meaning maintenance model, increased abstraction that is unrelated to an expectancy violation is one of these fluid compensations, and thus, the model holds that this type of unrelated abstraction is a conflict-resolution strategy, or dissonance-reduction strategy, in itself. As mentioned above, the meaning maintenance model further suggests that fluid compensation as increased abstraction occurs in typical dissonance research paradigms as well. This suggestion is based on the model’s presumed overlapping psychological processes between the feeling of meaninglessness stemming from watching/reading surreal and absurd fiction, and the feeling of discomfort stemming from attitude-behavior discrepancies. In an induced-compliance study aimed at testing this idea, Randles et al. (2015, study 3) found that individuals in a dissonance condition (vs. non-dissonance condi-
tion) exhibited more unrelated abstraction. In this experiment, unrelated abstraction was operationalized by the researchers as higher accuracy and higher motivation to find patterns in an implicit-learning task (Reber, 1967). They found an effect only for the motivational aspect. Randles et al. (2015) claim that attitude-behavior discrepancies, just as expectancy violations, lead to a motivation to reduce negative affect by any available reduction strategy – even of the strategy is unrelated to the situation. Note, however, that Randles et al. (2015) did not test whether the attitude-change effect, or the emotions experience during the experiment, were related to the results from the implicit-learning task. Thus, it is unclear whether their study does show that unrelated abstraction is a dissonance-reduction strategy in itself, as it might simply be a by-product of the conflict (or the experimental manipulation to be exact). In other words, it is somewhat debatable what unrelated abstraction measured with an implicit-learning task is supposed to reveal.

Difference between dissonance theory and meaning maintenance model

The reason why dissonance theory and the meaning maintenance model might interpret the results from Randles and colleagues differently is because these theories rest on different assumptions and definitions regarding dissonance reduction (or conflict resolution). As mentioned above, contrary to meaning maintenance model, dissonance theory hold that people might reduce dissonance via more cognitive-focused or more emotion-focused strategies (cf. Study III). Furthermore, most dissonance-reduction strategies function to address the actual conflict, not to simply make the individual feel better. Thus, one obvious objection to the generalization of the notion of fluid compensation (i.e., conflict-resolution strategies, unrelated to the conflict itself, aimed at reducing negative affect) is, for instance, that decisional dilemmas (e.g., choosing one of several equally attractive destinations for vacation) require individuals to actually make a decision in order to proceed with the situation. This process often involves finding coherent structures of the attributes related to the decision alternatives rather than simply reducing negative affect (see E. Harmon-Jones & C. Harmon-Jones, 2012, on this point). In other words, not all dissonant situations are the same. Some situations might include an obvious way of resolving the conflict via cognitive consonance (e.g., attitude change or transcendence), whereas in other situations it might be more appropriate to simply try to reduce negative emotions without resolving the conflict (e.g., distraction, escape, or self-affirmation). Thus, abstraction as an inherent part of the attitude-change process, as transcending the specific dissonant situation, or as unrelated to the situation might simply be a question of context.

The cases studied within the meaning maintenance model are characterized by lack of attribution and control in which the surreal and absurd experimental
materials result in a feeling of meaninglessness. However, since common experimental paradigms used in dissonance research are not characterized by this lack of attribution and control, one has to wonder to what extent typical dissonance experiments and typical experiments used in meaning maintenance research really bring about overlapping mental processes. One has to be careful here and not equate certain mechanisms on the basis of superficial similarities. Clearly, both expectancy violations and attitude-behavior discrepancies are cognitive conflicts, but they stem from different sources and are thereby associated with different appraisal processes and reduction strategies. Thus, alleviation of negative affect as the primary restoration alternative is simply a product of the type of experimental paradigm used when testing the meaning maintenance model – not an inherent feature of dissonance reduction. Expectancy violation is a specific type of cognitive conflict that might lead to unrelated abstraction such as finding patterns in random stimuli in order to regain some sense of meaning and structure. However, whether unrelated abstraction is to be regarded a dissonant-reduction strategy in itself is unclear. The unrelated abstraction found in the induced-compliance study by Randles and colleagues might simply be a by-product of the dissonant situation.

Emotions and Attitude change

In Study 2 of the thesis, it was shown, in two experiments, that attitude change is positively related to positive emotions, and inversely related to negative emotions. However, these relationships do not directly show the exact mechanisms and causal chain, such as when people begin to modify their attitude and why they feel more positive and less negative in relation to their writing. In the experiments, participants were asked, immediately after writing the counter-attitudinal essay, to what extent did you experience the following emotions when writing the essay? After completing that questionnaire, they were asked to state their attitude towards the target issue. Because emotions were measured first, a crude conclusion would be that emotions influenced attitude change. That is, the more positive and less negative one feels during the writing of the essay, the more likely one is to change attitude afterwards. A closer examination of this situation, however, does not exclude the alternative explanation that attitude change occurred during the writing of the essay, and emotions followed from that change in attitude. That is, one feels more positive and less negative because one has managed to resolve the cognitive conflict by accommodating the behavior into the existing cognitive structure related to the situation. As noted in the paper, some individuals might also be more positive and less negative because they were satisfied with how they wrote the essay – not because they changed attitude. Another possibility could be that there is no direct relationship between emotions and attitude change. Thus, emotions and attitude change might correlate because attitude change requires
some increased level of abstraction, and it is the abstraction that is related to positive emotions, not attitude change per se. In fact, the broaden-and-build theory (Fredrickson, 2004) argues that there is an inherent relationship between positive emotions and abstraction – which has also been empirically demonstrated (see, e.g., Fredrickson & Branigan, 2005). However, one could argue that, since abstraction is an intrinsic part of attitude change, the relationship between attitude change and emotions is direct and abstraction is the mechanism which explains the relationship. Lastly, it is important to underline that these results are obtained when people have to argue for an attitude they initially held as negative. It is thus unclear whether a similar process would occur if people had to argue against an attitude they originally held as positive. This type of “reversed” induced-compliance paradigm has rarely been investigated in dissonance research (see Harmon-Jones, 2000, for an exception).

An important point to raise in this discussion is the relationship between positive and negative emotions in the attitude-change process. For some people, this relationship is rather clear-cut: when they experience more positive emotions they experience less negative emotions. However, other individuals who changed attitude may have experienced more mixed emotions (see Study III). One suggestion could be that negative arousal might develop much quicker into negative emotions for some individuals – meaning that they have to work considerably harder to change attitude. Consequently, for these individuals, the initial negative emotion might linger even after the attitude change.

Abstraction, positive emotions, and attitude change

Prior research has shown a relationship between positive emotions and abstraction (Fredrickson, 2004; Fredrickson & Branigan, 2005), hence there could be an inherent connection between the results in Study I and II. I will exercise my freedom here to speculate on how the connection might look. First, I believe that they might be connected in different ways. Those who are able to change attitude rather quickly may experience more positive emotions, but the increased abstraction might be an effect of positive emotions rather than attitude change – since they might not have put too much cognitive effort into changing attitude. In this case, the relationship between abstraction and attitude change might be an indirect relationship. This might happen when the initial attitude and/or the importance of that attitude was not too strong to begin with. For instance, being negative towards the student aid proposal simply because oneself is a student, but not because one cares too much about students’ financial situation in general would make it rather easy to modify the attitude (e.g., “this proposal could bring about some positive changes, but since I’ll graduate next year I will probably not be too affected by the rule changes anyway”). A second possibility is that some individuals may find the situation difficult but could ultimately manage to change/modify their attitude.
Presumably, they made a more conscious effort to resolve the inconsistency and might have broadened their mental horizon of the situation (e.g., “this proposal might actually help me and my fellow students to study harder and learn more during our time at university”). In this case, the abstraction precedes the attitude change which in turn leads to positive emotions. Note that these individuals might have a mixture of both positive and negative emotions, since feelings of discomfort may linger on from the initial detection of dissonance and the difficulties of resolving the conflict. Lastly, in situations where the individual sees the big picture of the dissonant situation (i.e., transcendence) without changing attitude, the increased positive emotions might be an effect of the increased abstraction (e.g., “even if this particular proposal were to pass, I still believe that most changes at university have been for the better”). Alternatively, as mentioned above, people might experience more positive emotions because they are satisfied with the essay they wrote, and thereby the positive emotions might precede the abstraction (cf. broaden-and-build theory). In sum, there are many ways in which these variables could connect to one another. Future research is needed to understand (a) if attitude change and abstraction are activated sequentially or simultaneously, (b) if these are completely separated, and (c) if attitude change in a dissonance context is inherently a mental act of abstraction.

Adaption and function in dissonance theory

In this subsection, I will elaborate on the notions of adaption and function in order to reconcile the broad cognitive-emotion perspective of Study III (i.e., the general dissonance reduction model) with the action-based model (Harmon-Jones et al., 2009). The action-based model attempts to answer the question: why does cognitive dissonance produce negative affect, and is the reduction of this affect functional and beneficial? Drawing on the notion that cognitions can serve as action tendencies (e.g., Smith & Semin, 2004, 2007), the model concludes that dissonance evokes negative affect because dissonance might impede effective action. From this, the model further concludes that dissonance processes must be functional and adaptive. The model is primarily concerned with cognitions related to the individual’s committed actions and goals. Commitment is defined broadly, as it includes attitudes, behavior, beliefs and values. Thus, the stronger one holds the value of equal rights, the more committed one is to that cognition.

Adaption and function

I agree with the action-based model that, in general, dissonance processes are psychologically beneficial and adaptive. However, the action-based model
does not elaborate on how and to what extent dissonance processes are beneficial and adaptive. From the broader cognitive-emotion perspective of Study III, any overused reduction strategy (i.e., attitude change) might become mal-adaptive over time – even if it does facilitate action execution at that particular moment. For instance, always modifying one’s attitude in relation to current behavior might lead to a low sense of self-knowledge and integrity, which in turn might lead to loss of respect from one’s peers. I would therefore argue that facilitation of action execution is not in itself sufficient for calling a certain reduction strategy adaptive or beneficial. In relation to this, I would suggest including social adaption to the definition of adaption in a dissonance context. That is, adaption in a dissonance context might depend largely on the social environment (cf. Weick, 1968). For example, in some situations a reduction strategy facilitating social bonding might actually be more adaptive than a strategy equal in action-facilitation properties but without any social-bonding properties. Furthermore, although flexibility has been argued to be psychologically adaptive (e.g., Bonanno & Burton, 2013), some individuals might be flexible only to satisfy short-term goals (see the attitude-change example above) – which may make this type of flexibility maladaptive in the long run. Thus, there may be limits to the extent to which dissonance processes are adaptive. Overall, given the examples above, I believe that placing dissonance processes in a broad cognitive-emotion perspective might advance our understanding of how and to what extent dissonance processes are adaptive.

Related to the issue of adaption, the action-based model has a rather narrow definition of “effective action” in dissonance processes. The proponents of the action-based model argue that “Dissonance reduction, by bringing cognitions into line with behavioral commitments, serves the function of facilitating the execution of effective and unconflicted action” (Harmon-Jones et al., 2009, p. 128). Problematic, though, is that it seems as if the functional explanation only accounts for strategies that fall in line with the dissonant behavior (i.e., attitude change) – defined as approach motivated behavior. However, there are many ways of reducing dissonance, and some of these strategies include avoidance mechanisms (distraction and escape), whereas other strategies are approach motivated but the opposite of attitude change (i.e., attitude bolstering) (cf. Study III). These strategies also facilitate action, but not for the purpose of falling in line with the dissonant behavior. In relation to this, the proponents of the action-based model argue that “The action-based model would predict that reducing dissonance by means other than attitude change would be more likely when action was not greatly needed or when the action implications of the cognitions were low” (Harmon-Jones et al., 2009, p. 143). This prediction is somewhat problematic, since attitude bolstering occurs because action implications are very high (i.e., the attitude-behavior discrepancy was too large), and distraction or escape occur because action was much needed (i.e., the situation is too dissonant). In sum, from these examples I would suggest that the
definition of “effective action” needs to be broadened (by including any strategy that facilitates action execution) in order to fully understand dissonance-reduction processes.

Different views on the cognitive consistency framework

In this last subsection, I will revisit the cognitive consistency framework, and discuss its different conceptualizations. This notion stems from early twentieth century gestalt psychologists who discovered that the perceptual system organizes stimuli in a tidy and easily digestible manner (Köhler, 1959; Lewin, 1951). Later, psychologists suggested that this core perceptual principle might be a key feature of human cognition in the social and interpersonal environment (e.g., Heider, 1958; Festinger, 1957; Osgood & Tannenbaum, 1955). In a recent target article, however, Kruglanski et al. (2018) argue that the concept of cognitive consistency needs to be reconsidered. Kruglanski and colleagues proposed a model (called the expectancy-value model) which predicts affective reactions to inconsistencies and consistencies from both desirable and undesirable outcomes. They argue that there is no universal need for cognitive consistency, but rather that people care about the implications of new information on prior expectations (i.e., epistemic knowledge) regarding desirable/undesirable outcomes. For example, they would argue that eating meat while trying to uphold a vegan diet does not produce negative affect itself, but it is rather the desire one has for the behavior to be consistent with prior attitude/belief. When this desire is not met, negative affect is produced because the unmet desire might bring about negative consequences for the individual or others. Consequently, cognitive consistency should be viewed as a means to an end, not an end in itself (see also Kruglanski & Shteynberg, 2012).

Major differences between different conceptualizations of cognitive consistency

First, Kruglanski et al. (2018) present their model from a more self-oriented perspective of cognitive conflicts (cf. New Look Model; Cooper & Fazio, 1984). That is, negative affect and a subsequent reduction attempt is only produced when people violate important and self-relevant cognitions, and when this violation has negative consequences. Other researchers do not restrict the scope of cognitive conflicts to situations explicitly related to self-concepts and aversive consequences (see, e.g., Gawronski & Brannon, 2019; Harmon-Jones et al., 2009, 2012; McGregor, Newby-Clark, & Zanna, 1999, 2019; Proulx & Inzlicht, 2012; Read & Simon, 2012; Simon & Holyoak, 2002; Simon & Read, 2018; Simon, Snow, & Read, 2004). Second, the expectancy-value model assumes that people process inconsistent information in a conscious Bayesian-
like manner, and the model deals with single informational updates from a single expectancy. Other models deal with multilayered motivational conflicts (e.g., trying to be a present father but also a successful businessman, and sometimes just wanting to get away from all obligations) or multi-attribute decisional dilemmas (e.g., wanting to spend the weekend at the golf course for one set of reasons, and wanting to spend the weekend working at the office for another set of reasons, both of which are equally valid), and do not adhere to a Bayesian approach to inconsistencies (see, e.g., E. Harmon-Jones & C. Harmon-Jones, 2018; Simon & Read, 2018). Third, the expectancy-value model assumes a linear and unidirectional flow of information processing, whereas Simon and Read (2018) explicitly argue for a bi-directional process. For instance, the notion of coherence-based reasoning holds that making conscious decisions involves actively forming coherent structures of information (e.g., a judge trying to make sense of the course of action in a criminal case). This active process should in turn lead people to unconsciously modify prior interpretations of information in order for it to fit the coherent structure (the judge might alter his/her prior thoughts on potential accomplices after “making sense” of the course of action; see, e.g., Glöckner & Engel, 2013). Thus, the very act of trying to make sense of information influences how prior information is interpreted. Fourth, these different conceptualizations seem to treat the emotional aspect differently. Connectionist models usually argue that the inclusion of emotional and motivational pressures is not intrinsically necessary for understanding the coherence process in the mind – since cognitions tend to self-organize in coherent structures without explicit emotion and motivation (see, e.g., Simon & Holyoak, 2002; Simon, Snow, & Read, 2004). The meaning maintenance model and action-based model, however, focus on situations where affective responses do follow from inconsistencies. Yet, these theoretical models assume that conflicts from low-level processing are enough to produce affective responses which in turn could influence cognition and behavior. For instance, presenting people with a deck of cards where the hearts and diamonds are black and the spades and clubs are red, seems to produce physiological reactions, such as pupil dilation, interpreted as negative affect (e.g., Levy et al., 2018). The expectancy-value model deals with conflicts that are consciously perceived and motivationally important for people. Thus, this model argues that only these conflicts produce negative affect, and subsequent reduction attempts.

My viewpoint
First of all, in this discussion it is important to distinguish between (a) the underlying structure of the cognitive system and the processes related to cognitive conflict; (b) the type of inconsistencies people consciously react to and those that are automatically resolved; (c) the initial affective response and the final full-blown emotion; and (d) different ways of resolving inconsistencies.
These aspects are important to distinguish in order to understand the bigger picture of the cognitive consistency framework. By doing this, it will be easy to see that different conceptualizations of this framework are not always at odds with one another – it is simply a matter of how broadly one wishes to define the concept.

First, the structure of the cognitive system is not the same as the process of detecting and reducing dissonance. The structure of the cognitive system is most likely based on coherence and integrating principles that seem to have self-organizing properties not directly governed by affective reactions (cf. perceptual closure and perceptual constancy) (see, e.g., Read & Simon, 2012). One can compare it to computer software continuously running in the background and setting the stage for the interaction between the organism and the external world. Some theorists do not include this “software” in their conceptualization (Kruglanski et al., 2018), whereas others hold it as fundamental (Read & Simon, 2012). On this point, I would agree with the latter viewpoint – since any organism would need to form (via some sort of innate “software”) fairly structured perceptions of the external world in order to survive.

As for the detection of inconsistencies, because of this strong coherence-integrating principle of the computer software, I would hold that minor inconsistencies do not require elaboration and are dealt with via pre-programmed (innate) automated processes (cf. first level of processing in the component process model; Scherer, 2009). One could compare this to our innate fear of snakes and spiders. At a higher schematic (learned) level (but still automated), one can detect and deal with inconsistencies via unconscious processes (implicit expectancy violations, implicit imbalance, and implicit ambivalence). Sometimes people detect inconsistencies that deviate too much from the background, and these inconsistencies reach the conscious part of the mind. I would suggest that these inconsistencies (e.g., attitude-behavior discrepancy, explicit expectancy violations, explicit ambivalence, conscious decision making) are those that have clear implications for, for instance, action execution (cf. action-based model, Harmon-Jones et al., 2009), one’s self-concept (cf. expectancy-value model, Kruglanski et al. 2018; New Look Model, Cooper & Fazio; and self-consistency model, Aronson, 1969, 1992) and forming unambiguous preferences and attitudes (Petty et al., 2006).

As for affective reactions, I hold that a series of multilevel bi-directional top-down and bottom-up cognitive appraisals (cf. component process model, Scherer, 2009), produce the initial affective response which signals to the organism that further consideration is needed. Whether or not a full-blown negative emotion emerges (e.g., anger, fear, guilt, shame, etc.), I believe that this will depend on (a) the magnitude of the conflict, (b) how quickly one can restructure the cognitions related to the situation, (c) current cognitive capacity, and (d) the nature of the social situation (cf. general model of dissonance reduction, Study III). Finally, how people eventually deal with inconsistencies will depend on, for instance, habitual responses, personality/temperament, and
social environment. In accordance with several other theorists (e.g., Gawronski & Brannon, 2019; Harmon-Jones et al., 2009), I hold that people could either focus on reducing their emotions (e.g., distraction or escape) or restructuring their cognitions (e.g., attitude change). Interestingly, because of the recursive nature of cognitions and emotions, positive emotions, rather than negative ones, might emerge after the conflict resolution (cf. Study II). However, unlike other conceptualizations, I suggest conceptualizing cognitive consistency within a broad cognitive-emotion perspective. As with my conceptualization of dissonance theory, this framing of cognitive consistency could reconcile different views of this framework without tampering too much with each individual viewpoint.

Concluding thoughts on cognitive consistency framework
I believe that, even after more than sixty years, the notion of cognitive consistency is still a reasonable way of thinking about how the mind integrates information that later guides cognition and behavior – regardless of how one wishes to conceptualize the notion. Further developments should focus on (a) the relationship between implicit conflict processing and implicit conflict resolution, (b) the appraisal process involved in the detection of inconsistencies, and (c) how the cognitive consistency framework is explicitly related to the notion of situated cognition.

Methodological and theoretical limitations
Throughout this thesis, specifically in Study I and II, the empirical results have been based on the induced-compliance paradigm with attitude change as the main dependent variable. The most obvious limitation of this approach is that this paradigm only accounts for attitude-behavior discrepancies. However, cognitive conflict can also arise from belief dilemmas, irrevocable decisions, informational conflicts, etc. Thus, results from Study I and II must be interpreted with some caution, since, for instance, the relationship between abstraction and dissonance might not appear in other dissonant situations. That is, from the results of Study I, it is not obvious that people should exhibit a more abstract (or concrete) mindset after making a difficult decision (e.g., in the free-choice paradigm), or that the selective-exposure effect is related to abstraction. Furthermore, the relationship between emotions (positive and negative) and dissonance reduction (found in Study II) might also be exclusively related to the induced-compliance paradigm. That is, the spreading-of-alternatives effect usually found in the free-choice paradigm might not show the same relationship between emotions and dissonance reduction found in Study II. Although Study III presented a more pluralistic view of dissonance reduction, the empirical demonstration in that study was based on results from the second induced-compliance experiment of Study II. Thus, it is unclear
whether other dissonance experiments would reveal similar variation in reduction strategies and emotional reactions. Furthermore, results from the studies in this thesis suffer from the fact that they have all been dependent on student samples. An older non-student sample might reduce dissonance and/or react emotionally to dissonance differently, compared to twenty-five-year-old students (see also Future directions section below). As for the theoretical approach of Study III, a limitation is the exclusion of the notion of coherence-based reasoning (Read & Simon, 2012) – which usually makes the point that the information tends to self-organize in coherent structures without emotional and motivational pressures.
Future directions

As this thesis suggests that there are many things left to discover in dissonance research, it is important look ahead and try to figure out how to address some newly formulated questions. I believe that a first step could be to create a taxonomy of different dissonant situations (cf. DIAMOND taxonomy of major dimensions of situation characteristics; Rauthmann, Gallardo-Pujol, Guillaume, Todd, Nave, Sherman, et al. 2014). The reason for this is twofold: first, from a theoretical perspective it is important to clarify what is meant by a dissonant situation, and thereafter to try to understand what is common and different within and between dissonant situations. With a taxonomy, one might avoid situations where researchers create different models based on specific dissonant situations or dissonant strategies without it being clear that these are special cases of dissonance theory. The second reason for a taxonomy is related to empirical research. From this viewpoint, a taxonomy would facilitate what to predict and how to understand certain outcomes when studying different dissonance situations. Furthermore, relating one’s findings to the taxonomy may result in new ideas that would not have been possible without the taxonomy. For example, ascertaining that some dissonant situations are more alike, or less alike, than previously assumed, or that some emotions are uniquely related to some specific reduction strategy.

Returning to empirical research, one way in which to study new ideas and advance dissonance theory is to go outside the lab. Current technology has made it possible to follow individuals in real time during their everyday life. Experience sampling is one method that takes advantage of this in a simple and rather non-intrusive way. Researchers could, for instance, let individuals report via an application (e.g., twice a day during a week) if they (a) encountered some type of dissonant situation, (b) how it felt, and (c) how they handled it. This could inform us about the prevalence of different types of dissonance (e.g., decisional dilemmas and belief dilemmas), the variety of emotions related to different situations, and the usage of different reduction strategies, as well as the relative difference in prevalence between emotion-based reduction strategies (e.g., self-affirmation and distraction) and cognitive-based reduction strategies (e.g., attitude change, compartmentalization). From these results, we might actually gain insights which are not easily captured in a lab environment.

A think-aloud protocol (Ericsson & Simon, 1980; Svenson, 1979) would help us to understand people’s thought processes during different dissonance
manipulations (induced compliance, free choice, belief dilemmas, etc.). By tracing the thought process of an individual, we can start to understand which thoughts are associated with the conscious detection of a dissonant experience and the internal mechanism and structure. These thoughts could be organized around categories such as thoughts of others, self, implications of behavior, etc. Each category could be further organized around subcategories such as thoughts of own emotions, own responsibility, own mechanistic behavior, etc. This work could be one of the steppingstones of the construction of the taxonomy mentioned above. Moreover, this procedure has research value in its own right as well. A think-aloud protocol can inform us about people’s conscious thoughts as they happen (i.e., concurrently). Thus, one is able to avoid problems such as selective remembering and hindsight bias.

Earlier in this thesis I mentioned the notion of dynamic processes (or systems). This school of thought is based on models of systems that behave in a non-linear manner, and where the output is extremely sensitive to starting positions. That is, a minor change in initial conditions could give rise to completely chaotic and unpredictable solutions. However, over time, the accumulation of each of these chaotic solutions create coherent patterns. Many psychologists have begun to apply this framework to human thought and behavior (see, e.g., Guastello, Koopmans, & Pincus, 2008). In dissonance research, Read and Simon (2012) argue that their connectionist model indicate that cognitions seem to self-organize in coherent patterns. Vallacher, Van Geert, and Nowak (2015) have argued that social and developmental psychologists should study patterns of behavior over time rather than a single act in one isolated event. I believe this notion can advance our understanding of how people develop (and change) dissonance reduction strategies across their life span—and also why maladaptive (habitual) reduction strategies persist.

Ever since Festinger’s original formulation of dissonance theory, individual differences in dissonance experience and dissonance reduction have been discussed. However, to date there has not been any large-scale attempt at examining the role of individual differences in dissonance reduction. A few studies have used one or two personality-like factors as moderators. While research has provided some important insights into how personality can moderate dissonance reduction, the findings are rather disconnected from each other, and somewhat ambiguous (e.g., both high and low self-esteem have been related to attitude change). Also, past studies have focused almost exclusively on a single outcome variable (i.e., attitude change). A serious take on an individual difference approach requires assessments of the individual’s response to cognitive dissonance across different experimental paradigms (free choice, induced compliance, effort justification, etc.), and testing a multitude of outcomes in order to disentangle what is common and what is unique to specific situations (and to specific reduction strategies).
Concluding remarks

Overall, this thesis shows that there still remains much to discover in this remarkably useful theory of cognitive dissonance. From the perspective of mental representations, Study I revealed a clear relationship between an increased abstract mindset and the experience of cognitive dissonance. It was also revealed that the famous attitude-change effect was related to abstraction. This study bridged a gap between action-identification theory and dissonance theory, proposed by Robin Vallacher (1992) when responding to Aronson’s (1992) claim that many newly formed theories (including action-identification theory) could be understood within dissonance theory. In Study II, the old dissonance-research conundrum regarding emotions and attitude-change was solved by simply rephrasing what participants should focus on when stating to what extent they experience certain emotions. More precisely, Study II revealed, in two separate experiments, that positive emotions were positively related to attitude change and that negative emotions were inversely related to attitude change. Lastly, in Study III I put forward a general model of dissonance reduction to reconcile past accounts. Based on Festinger’s (1957) original idea that cognitive dissonance produces a negative affective state that motivates people to reduce it, the concepts of appraisals, emotion regulation, and coping were used to present a model that goes beyond any isolated dissonance research paradigm or specific reduction strategy. Taken together, these three studies show the importance of moving beyond the specific context in which a theory operates and trying to connect the dots to other frameworks or meta-theories in order to truly understand what the theory can and cannot do. Fortunately, the last decade has seen a shift back to Festinger’s original encompassing formulation of dissonance theory. This shift enables researchers to connect dissonance theory to other neighboring domains of psychology and thereby increase its usefulness. However, it is important to continue to challenge some of the basic assumptions of the theory in order to develop it further.
References


