Review Article

# Understanding Psychological Reactance

## New Developments and Findings

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**Abstract.** Since Brehm first proposed reactance theory in 1966, many studies have explored the remarkable psychological phenomenon of reactance, which Miron and Brehm reviewed in 2006. We present an overview of research that has been done since then. A variety of studies have provided interesting new insights into the theory, adding to what is known about the phenomenon of reactance and the processes activated when people are confronted with threats to their freedom. Nevertheless, many issues that have not been clarified remain to be examined. We therefore close with proposing some suggestions for future research.

**Keywords:** (vicarious) reactance, culture, persuasion, motivation, dual process

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> "Why is it that a child sometimes does the opposite of what he is told? Why would a person sometimes dislike receiving a favor? Why is propaganda frequently ineffective in persuading people? And why would the grass in the adjacent pasture ever appear greener?" (Brehm, 1966, p. v).

Almost 60 years have passed since Brehm presented a theory of psychological reactance as an answer to these questions. Reactance – the motivation to regain a freedom after it has been lost or threatened – leads people to resist the social influence of others. Since Brehm's first publication on reactance in 1966, the phenomenon has attracted attention in basic as well as applied research in areas such as health, marketing, politics, and education, and a wealth of reactance studies have been published. Forty years after Brehm's first publication, Miron and Brehm (2006) reviewed those areas they found especially relevant and pointed to several gaps in the research. Inspired by their review paper, we set out to explore the research addressing these gaps. About 50 years after the theory was first proposed, it is much clearer what reactance is and what role it plays when freedoms are threatened. However, there are still unanswered but important questions for psychology to clarify.

## Reactance Theory

In general, people are convinced that they possess certain freedoms to engage in so-called free behaviors. Yet there are times when they cannot, or at least feel that they cannot, do so. Being persuaded to buy a specific product in the grocery store, being forced to pay tuition fees, being prohibited from using a mobile phone in school, and being instructed to perform work for the boss are all examples of threats to the freedom to act as desired, and this is where reactance comes into play. Reactance is an unpleasant motivational arousal that emerges when people experience a threat to or loss of their free behaviors. It serves as a motivator to restore one's freedom. The amount of reactance depends on the importance of the threatened freedom and the perceived magnitude of the threat. Internal threats are self-imposed threats arising from choosing specific alternatives and rejecting others. External threats arise either from impersonal situational factors that by happenstance create a barrier to an individual's freedom or from social influence attempts targeting a specific individual (Brehm, 1966; Brehm & Brehm, 1981; Clee & Wicklund, 1980). The unpleasant motivational state of reactance results in behavioral and cognitive efforts to reestablish one's freedom, accompanied by the experience of emotion. People who are threatened usually feel uncomfortable, hostile, aggressive, and angry (Berkowitz, 1973; Brehm, 1966; Brehm & Brehm, 1981; Dillard & Shen, 2005; Rains, 2013). On the behavioral side, threatened people may exhibit the restricted behavior (direct restoration) or may observe others performing a related behavior (indirect restoration). They may aggressively force the threatening person to remove the threat or they may behave in a hostile and aggressive way just to let off steam (aggression). On the cognitive side, people may derogate the source of threat,

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upgrade the restricted freedom, or downgrade the imposed option (change in attractiveness; e.g., Bijvank, Konijn, Bushman, & Roelofsma, 2009; Brehm, 1966; Brehm & Brehm, 1981; Bushman & Stack, 1996; Dillard & Shen, 2005; Heilman & Toffler, 1976; Quick & Stephenson, 2007; Rains, 2013; Rains & Turner, 2007). However, despite the well-explored consequences of reactance, there has been little exploration of reactance as a state per se. Reactance leads to behavioral, affective, and cognitive effects, but what exactly causes these effects?

With the questions Miron and Brehm (2006) asked and the research they reviewed as a starting point, we set out to consider more recent advances. Here, we present our review of research on the measurement of reactance, the role of culture and self, vicarious reactance, determinants of reactance in the context of persuasion, and the crucial role of motivation in reactance processes. We review studies indicating different reactance processes – some of them showing that specific freedom threats arouse an intermingled state of affect and cognition and some of them showing that specific freedom threats arouse an immediate, emotional reaction while others arouse a cognitive and a delayed emotional reaction. We conclude by discussing remaining issues and future research directions.

## Can Reactance Be Measured?

In their review paper, Miron and Brehm (2006) already provided some answers and further suggestions to the question of how to measure reactance. For measuring reactance as a trait they specify measurements such as the Hong' Psychological Reactance Scale (HPRS; e.g., Hong, 1992) which is still the most commonly used instrument. It has been translated into many languages and is used in countries around the world (De las Cuevas, Peñate, Betancort, & de Rivera, 2014). However, research still does not agree on the factor structure. While Jonason, Bryan, and Herrera (2010) reduced the original 18-item scale to a one-factor measure comprising 10 items, De las Cuevas et al. (2014) suggested a two-factor structure comprising an affective and a cognitive dimension.

Measurements of the state of reactance are rare, possibly because Brehm conceptualized reactance as "an intervening, hypothetical variable" that cannot be measured directly (Brehm & Brehm, 1981, p. 37; see also Brehm, 1966). However, in 2006 Miron and Brehm suggested that "reactance could be directly assessed through measurement of the subjective experience (feeling) that accompanies the urge to restore freedom" (Miron & Brehm, 2006). The authors suggested that future studies should explore what people feel if they experience threats to their freedom. Over the last 10 years the question of how to measure the experience of reactance has attracted increasing attention.

Exploring persuasive messages, Dillard and Shen (2005) developed four items to assess people's perceived threat to freedom with regard to the message.[1] They demonstrated that a message that is perceived as highly threatening to one's freedom arouses reactance, which they conceptualized as a latent variable intermingling anger affect and negative cognition. To measure anger affect, Dillard and Shen asked their participants to indicate how irritated, angry, annoyed, and aggravated they were with regard to a freedom-threatening message. Further, they instructed participants to write down whatever came to mind after reading the message. Independent raters coded the thoughts as supportive, neutral, or negative. They found that anger and negative cognitions in the form of counterarguments mediated the relationship between the freedom-threatening message and people's attitudes toward the message. This attitude guided people's behavioral intentions to follow or not follow the advice of the message. But did affect and cognition have separate or combined effects on people's responses to the message? To test this, the authors compared four structural equation models: a single-process cognitive model, a single-process affective model, a dual-process model in which affective and cognitive reactions had unique effects on people's responses to the persuasive message, and an intertwined model in which affect and cognition were considered an alloy that could not be disentangled. In two studies they found the best fit for the intertwined model. In a meta-analytic review of 20 studies, Rains (2013) confirmed that the intertwined model was superior to the alternative models.

In a line of research on cross-cultural reactance (also see the section Reactance, Culture, and the Self), Jonas and colleagues used a different approach to measure the experience of reactance. They combined items assessing people's perception of threat to their freedom with items assessing people's emotional experience.[2] This measure has been shown to mediate the effect of freedom threat on behavioral intentions (e.g., the intention to help, Jonas et al., 2009, Study 4). It has since been used in several studies investigating reactance in the context of change situations (e.g., personal change or political reforms), vicarious threats, and culture, and it has been shown to mediate cognitive and behavioral outcome variables such as attitude, intended and real resistance behavior, and performance (Niesta Kayser, Graupmann, Fryer, & Frey, 2015; Sittenthaler & Jonas, 2012; Sittenthaler, Traut-Mattausch, & Jonas, 2015; Traut-Mattausch, Guter, Zanna, Jonas, & Frey, 2011; Traut-Mattausch, Jonas, Förg, Frey, & Heinemann, 2008). Sittenthaler, Traut-Mattausch, Steindl, and Jonas (2015) validated these items together with items assessing aggressive behavioral intentions as well as negative

[1] On a 5-point response scale participants responded to the items "The message threatened my freedom to choose"; "The message tried to make a decision for me"; "The message tried to manipulate me"; and "The message tried to pressure me."

[2] This experience of reactance scale consisted of the items "How reasonable would a favor like that appear to you?"; "How restricted would you feel in your freedom of choice?"; "How legitimate would a favor like that appear to you?"; "How much would you feel under pressure by being told you are the only one that can provide her this favor?"; "How much would a favor like that bother you?"; and "How irritated would you probably feel by a request like that?"


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evaluations and propose a new state reactance measure, the so-called Salzburger State Reactance Scale.

Miron and Brehm (2006) also suggested that another way of directly assessing reactance would be to use physiological measures. Past (Baum, Fleming, & Reddy, 1986) and current (Sittenthaler, Jonas, & Traut-Mattausch, 2015; Sittenthaler, Steindl, & Jonas, 2015) research has demonstrated that freedom threats affect people's physiological arousal. Whereas in the previous study (Baum et al., 1986) arousal level increased when people were confronted with an uncontrollable event, such as a threat to their freedom, in the more recent studies (Sittenthaler, Jonas, et al., 2015; Sittenthaler, Steindl, et al., 2015) merely imagining being restricted from visiting a flat they might have wanted to rent was sufficient to increase people's heart rate. Interestingly, there was a difference between the heart rate increase following an illegitimate restriction (unexpected and inappropriate) and a legitimate restriction (unexpected but appropriate, i.e., when people were given reasons for not being allowed to visit the flat). When confronted with an illegitimate restriction, people's heart rate increased immediately. Heart rate also increased following a legitimate restriction, but only after a time delay. This finding led us to assume that different processes might be involved when people are confronted with different kinds of threats to their freedom. Whereas some threats (e.g., illegitimate threats) seem to follow a more emotional process leading to immediate arousal, others might induce people to reflect upon the situation before getting into an arousal state (Sittenthaler, Steindl, et al., 2015; see also Sittenthaler, Jonas, et al., 2015, for similar processes when confronted with self-experienced vs. vicarious reactance, on which we elaborate in more detail below). These findings suggest that dual processes in the form of more automatic, impulsive affect-driven versus more cognitive dominated reflective information processing (e.g., Strack & Deutsch, 2004; for an overview, see Gawronski & Creighton, 2013) appear to be important when looking at reactance processes following different kinds of threats. Affect and motivational arousal seem to be involved in both types of reactance responses, but occurring a bit later for the more reflective, cognitively oriented responses. These findings allow us to connect this line of research with Dillard and Shen's (2005) intertwined model, which conceptualizes reactance as a latent variable intermingling affect and cognition (see also Rains, 2013). Even if people first reflect on the restriction to their freedom (cognition), the experience of reactance seems to be also characterized by affect.

Different lines of research all suggest that one important component of reactance is the experience of anger. Anger is typically understood as a negative emotion but is also related to motivation, namely, approach motivation (Harmon-Jones, 2003, 2004; Harmon-Jones & Allen, 1998; Harmon-Jones, Harmon-Jones, Abramson, & Peterson, 2009). Approach motivation – the motivation to move toward something – is a force that determines human behavior and affect (Gray, 1982, 1990). It contrasts with avoidance motivation, which motivates people to withdraw (Harmon-Jones, Harmon-Jones, & Price, 2013). In a theoretical overview on reactance, Chadee (2011) even proposed that approach motivation is the necessary prerequisite for reactance to emerge. Feeling able to resolve a threatening event (i.e., to cope with a situation) has been shown to evoke approach motivation (Harmon-Jones, Lueck, Fearn, & Harmon-Jones, 2006; Harmon-Jones, Sigelman, Bohlig, & Harmon-Jones, 2003). Because people experiencing reactance are striving to restore their freedom (i.e., they seem able to cope with the threat), reactance should be associated with approach motivation. Steindl, Jonas, Klackl, and Sittenthaler (2015) used electroencephalography (EEG) and found that reactance was associated with heightened left frontal alpha asymmetry, which is thought to be an indicator of approach motivation (Harmon-Jones, 2003; Harmon-Jones & Allen, 1998).

In summary, recent research suggests that reactance can indeed be measured. It is possible to assess people's experience of a threatening situation, the cognitive and affective processes that are activated by it, and the physiological arousal and activity in the brain that accompany the attempt to restore freedom. However, the extent to which people are affected by threats to their freedom and the resulting motivation to restore their freedom strongly depend on a person's self being involved in the reactance process.

## Reactance, Culture, and the Self

Miron and Brehm (2006) proposed that different cultures, such as individualistic and collectivistic, react to different threats and in different ways to restore their freedom. They suggested that it might be crucial whether a threat comes from individuals inside or outside one's group. They cited research showing that individualists and collectivists differ in their expectations of control and choice and thus in their self-construal, making them more or less sensitive to threats (Iyengar & Lepper, 1999). Assessing people's experience of reactance by measuring perceived threat and emotional experience, Jonas et al. (2009) showed that individualists or people with an independent self-construal are more affected by threats to their individual, personal freedom (e.g., doing another person a favor by lending him/her one's business car), in contrast to collectivists or people with an interdependent self-construal, who are more affected by threats to their collective freedom, that is, threats affecting not only themselves but also their group (e.g., doing another branch a favor by lending them a pool of business cars). The same results were obtained when independent versus interdependent values were primed by describing the differences versus similarities between themselves and their close others (see Trafimov, Triandis, & Goto, 1991). This suggests that people's experience of reactance strongly depends on the goals and values most accessible when the threat occurs. In these cultural studies, whether the values were group or individual was the key factor causing the differences in reactance. Thus, the experience of reactance as a mix of perceived threat and emotions seems to be motivational in nature. Only if people's values are affected do they seem to be energized to strive for a restoration of their freedom.

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Graupmann, Jonas, Meier, Hawelka, and Aichhorn (2012) found that a threat to freedom of choice coming from one's ingroup aroused more reactance in individualistic than in collectivistic people. Individualists indicated a higher increase of attractiveness of the eliminated option when the threat originated in the ingroup versus an outgroup. In contrast, collectivists indicated a higher increase in attractiveness of the eliminated option when the threat originated in an outgroup versus the ingroup. This again seems to be because individualists highly value their individual freedom and distinctiveness from their ingroup (Markus & Kitayama, 1991). Thus, they are highly threatened by decisions coming from the ingroup. Collectivists, by contrast, highly value the connectedness with their ingroup (Markus & Kitayama, 1991) and thus, do not feel threatened by decisions coming from the ingroup.

Further evidence illustrating the motivational character of reactance comes from Laurin, Kay, and Fitzsimons (2012). They explained the contradictory effect that some people may endorse a decision even though they are not in favor of it. Two factors determining the reaction to restrictions are the absoluteness of a restriction and self-relevance. If the threat is absolute, that is, sure to come into effect, people rationalize it. If it is nonabsolute, that is, it may not come into effect, people respond with reactance. Both effects, rationalization and reactance, were strongest if the restriction was self-relevant.

The differences in reactance processes that are due to one's self being involved in the threat raise the issue of vicarious reactance, in which a person experiences reactance to a threat to another individual or group, even if the threat does not have any implications for the person's own freedom of choice (Miron & Brehm, 2006). Is it possible to experience reactance on behalf of another person? What happens when people observe the restriction of another person?

## Vicarious Reactance

Two distinct views of vicarious reactance exist: (a) It occurs as a consequence of people cognitively taking the role of the restricted person and asking themselves what *the restricted person* might experience (see Brehm, 1972; Miron, 2002; Worchel, Insko, Andreoli, & Drachman, 1974), and (b) people experience reactance *themselves* while observing a threat to another person's freedom (Andreoli, Worchel, & Folger, 1974). Andreoli et al. (1974) tested female participants who observed an actor being excluded from a decision-making process and found that the participants themselves showed vicarious reactance by rating the attractiveness of the discussion topics higher when the actor was restricted versus not restricted. The authors concluded that "reactance can be aroused by the mere observance of a threat to another's freedom, without the perception of one's own freedom being potentially directly threatened" (p. 767).

Whereas Andreoli et al. (1974) measured reactance only in the form of cognitive changes in the attractiveness of an option, Sittenthaler and colleagues (Sittenthaler & Jonas, 2012; Sittenthaler, Jonas, et al., 2015; Sittenthaler, Traut-Mattausch, et al., 2015) assessed the subjective experience of vicarious reactance. They found that people experienced strong reactance as a mix of perceived threat and emotions if they observed or read about a freedom threat to another person. These vicarious reactions to freedom threats, however, were moderated by people's self-construal. People with a more interdependent self-construal or a collectivistic cultural background (e.g., coming from Bosnia or Croatia) experienced more vicarious reactance (especially for an ingroup member) compared to people with a more independent self-construal or an individualistic cultural background (e.g., coming from Germany or Austria). Furthermore, people with a more independent self-construal or an individualistic cultural background indicated stronger reactance when restricted themselves rather than being vicariously restricted (Sittenthaler, Traut-Mattausch, et al., 2015). Other cross-cultural studies on vicarious reactance among collectivists from the Philippines (Steindl & Jonas, 2012) and Eastern European countries (e.g., the Czech Republic, Romania, Russia; Sittenthaler & Jonas, 2012) replicated those findings.

People respond to both kinds of freedom restrictions (self- and vicariously experienced), but Sittenthaler and colleagues presented evidence that the process underlying vicarious threats is different from the process of self-experienced threats. Before experiencing the motivational arousal state of reactance, people observing a restriction first seem to need to think about the restriction of the other person. This was demonstrated by looking at threatened people's cardiovascular responses (Sittenthaler, Jonas, et al., 2015, Study 2): While there was an immediate increase in physiological arousal (e.g., heart rate) after self-restrictions, the increase after vicarious restrictions was delayed. Further evidence revealed that vicarious reactance is associated with a more reflective, cognitive process and self-experienced reactance with a more impulsive, emotional process (Sittenthaler, Jonas, et al., 2015, Studies 3 and 4). This was shown by using a cognitive load task (memorizing a 7-digit number), which diminished people's experience of vicarious reactance, and an emotionally distracting task (think about the nicest day of last summer), which only diminished self-experienced reactance.

In a nutshell, research in the cultural context has shown that reactance is a state that (a) is influenced by people's cultural self-construal and (b) can also be experienced vicariously. Only if the freedom threat affects aspects that are important to the self do people show reactance. This illuminates that reactance is motivational in nature. The motivational nature of reactance also becomes evident in the different reactance processes we described before – people's responses to self-experienced and illegitimate threats appear to be more impulsive, whereas the responses to vicarious and legitimate threats seem to be more reflective. Similar different processes can also be found in the persuasion context.

## Persuasion and Resistance to Change

If persuasion poses a threat to a person's free behaviors, reactance in the form of negative cognitions, such as


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counterarguing and anger affect, leads to more negative attitudes toward the message and consequently to less intention to behave according to the message. Counterarguing and anger as an intertwined reactance process have been shown to mediate the effect of perceived freedom threat on reactance effects such as disagreeing with the message (Dillard & Shen, 2005; Kim, Levine, & Allen, 2013; Rains, 2013).

Persuasive messages arouse reactance especially by using forceful and controlling language, such as the terms should, ought, must, and need. This language has been shown to be perceived as more threatening and as eliciting more reactance than noncontrolling language, such as the terms consider, can, could, and may (Miller, Lane, Deatrick, Young, & Potts, 2007; Quick & Stephenson, 2008). For example, in a study on convincing members of a fitness club to participate in special exercises, people who had been given a forceful message such as "you have to do it" compared to a nonforceful message such as "consider it" experienced more threat, which elicited more reactance (negative cognitions and anger), and consequently, people were less convinced (Quick & Considine, 2008). Additionally, how threatening controlling messages are perceived to be depends on the level of social agency. Social agency is the extent to which a social agent is "perceived as being capable of social behavior that resembles human-human interaction" (Roubroeks, Ham, & Midden, 2011, p. 157). Roubroeks et al. showed their participants low- or high-control advice about energy conservation in the form of a text only, a text with a picture of a robotic agent, or a text with a brief film clip of the agent (Roubroeks et al., 2011; Roubroeks, Midden, & Ham, 2009). Both studies confirmed that the stronger the social agency of persuasive messages, the higher people's perceived threat and thus the higher their reactance (negative cognitions and anger).

With regard to the reactance process in the context of persuasion, research by Silvia (2006) showed that threats to freedom through persuasive messages can elicit disagreement through different paths and that these paths have different consequences. If freedom was threatened at the end of a persuasive message, people directly disagreed with the message. If freedom was threatened at the beginning of the persuasive message, negative cognitions such as counterarguing and perceiving the source as low in credibility mediated the effect on people's disagreement with the message. While disagreement that originated directly from the threat at the end of the message decreased over time, disagreement that originated in negative cognitions was stable over time. Thus a reflective reactance process, in which cognitions affect subsequent reactions, is a more stable reactance process. Research by Ziegler, Schlett, and Aydinly (2013) furthermore suggests that in this state, people also seem to react very sensitively to the weakness of arguments when confronted with a highly threatening message. However, when they are in a state of positive or negative mood, the strength of the arguments plays a less important role in predicting their reaction toward the freedom threat. Interestingly, in a different line of research only people with sufficient cognitive resources showed reactance in the form of a negative attitude toward a restriction; without sufficient resources they even justified the restriction (Laurin, Kay, Proudfoot, & Fitzsimons, 2013).

So far, affect and cognition seem to be central elements if we want to understand the nature of reactance processes. This is most clearly expressed in the intertwined model of reactance (Dillard & Shen, 2005; Rains, 2013), but seems to be also supported by other research lines. However, even if reactance can be conceptualized as a latent variable intermingling anger affect and negative cognition, we can distinguish further between more affect-driven impulsive processes and more cognition-driven reflective reactance processes. In some situations, these different processes might be driven by both cognition and affect in an intermingling manner. However, in other situations, they might be distinguishable from each other. The latter becomes apparent if we look at shorter persuasive messages where there is less room for counterarguing.

For short messages, it has been found that the framing of the message as loss (e.g., "When you do not use sun protection you will pay costs.") led to a significantly stronger perception of threat than a gain frame (e.g., "When you use sun protection you will gain benefits.") and that the perceived threat was positively correlated with anger but not with negative cognitions (Cho & Sands, 2011). The authors speculated that "different types of messages create differences in the process of reactance" (Cho & Sands, 2011, p. 315).

The influence of different types of threats that rely on simple cues has also been explored in the context of political reforms. Citizens' reactions are influenced by the way politicians communicate reforms. Focusing on limitations that will result from the change has been shown to evoke more experience of reactance (using Jonas et al.'s, 2009, combined measure of an experience of perceived threat and negative affect) and thus more negative attitudes toward the reform than focusing on improvements that will result (Traut-Mattausch et al., 2008). Furthermore, a study by Förg, Jonas, Traut-Mattausch, Heinemann, and Frey (2007) demonstrated that experts communicating the reform to citizens aroused more experience of reactance and consequently a more negative attitude toward the reform than when laypeople delivered the message. Likewise, in the context of communicating changes, Niesta Kayser et al. (2015) used the same measurement (Jonas et al., 2009) and found that presenting a change message within an approach (focusing on possible positive outcomes) versus an avoidance (avoidance of possible negative outcomes) frame led to differences in people's experienced reactance. Changes presented as avoidance of negative outcomes aroused more experience of reactance, which mediated the effect of avoidance on people's lower agreement with the change. Avoidance resulted in more counterarguing and less positive perceptions of the communicator and the change message.

To summarize, in the context of persuasion, most of the recent research has been conducted in the tradition of Dillard and Shen's (2005) intertwined model, according to which people receiving persuasive messages perceive them as threats to their freedom, which further elicit an experience of reactance in the form of counterarguments that are accompanied by anger affect. When attempts are made

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to persuade people by using a forceful message, this message motivates people to present arguments against the persuasive attempt (counterarguing). This is a cognitive-reflective process leading to negative attitudes toward the message and finally results in lower behavioral intention to follow the aim of the message. Research that indirectly manipulated threat through framing has found reactance to be a combination of perceived threat and negative affect (Förg et al., 2007; Jonas et al., 2009; Niesta Kayser et al., 2015; Traut-Mattausch et al., 2008). In these studies it seems that certain cues elicit an affective-impulsive process, which further leads to negative cognitions and a behavioral intention to restore one's freedom. This might be comparable to dual-process models and their distinction between more impulsive and more reflective processes of social behavior (e.g., Strack & Deutsch, 2004; for an overview, see Gawronski & Creighton, 2013). On the one hand, Dillard and Shen (2005) and Rains (2013) tested a dual-process model and rejected it. Yet, on the other hand, as described earlier, Sittenthaler and colleagues have shown in two contexts that depending on the threat (legitimate vs. illegitimate threats; self-experienced vs. vicarious threats), people either react immediately or after a time delay with an increased physiological arousal that can be seen as an indicator of motivation (Baum et al., 1986; Wright, 2008; Zanna & Cooper, 1974). Results showing that reactance can emerge automatically also come from studies on the implicit activation of reactance.

## Priming Reactance

As mentioned by Miron and Brehm (2006), people do not react only to obvious, direct threats. Reactance can also be aroused in subtle ways and even outside of conscious awareness. In a study by Wellman and Geers (2009), participants were primed with modified items of the Therapeutic Reactance Scale (Dowd, Milne, & Wise, 1991). Additionally, they were given a pill and told that it either did or did not improve performance on accuracy tasks. Results indicated that participants who were primed with reactance and who were given an explicit expectation that they should be good at the task committed the most errors, contrary to the experimenter's expectation.

Chartrand, Dalton, and Fitzsimons (2007) showed that even subliminal primes can arouse reactance. They subliminally primed participants with the name of a controlling significant other person who wanted them to work hard versus a significant other who wanted them to have fun. Results reflected that participants primed with the controlling person's name opposed the person's wishes by answering fewer anagrams correctly than participants primed with the noncontrolling person's name.[3] Thus, it is possible to arouse reactance with stimuli not consciously perceived, and relatively automatic processes can produce immediate reactance effects.

However, this is not always the case. Kray, Reb, Galinsky, and Thompson (2004) found in a study on stereotype threat and negotiation that only an explicit expectation of behavior led to the exact opposite behavior. While an implicit activation of the stereotype that men are better in negotiating led to lower performance in women, an explicit activation led to higher performance in women.

## Reactance as Motivation

Reactance theory, following the tradition of dissonance theory, is a theory of *motivation*. Using Brehm's description of reactance, it is "a motivational state and as such is assumed to have energizing and behavior-directing properties" (Brehm & Brehm, 1981, p. 98). Therefore, reactant individuals have a strong urge to do something (Brehm & Brehm, 1981). This contrasts with the concept of learned helplessness, which is a state of passively enduring a threat or even withdrawing from it (Seligman, 1975). Helpless individuals usually do not feel capable of changing an unpleasant situation. Reactant individuals, in contrast, feel capable of changing the current situation, that is, the freedom threat (Mikulincer, 1988; Pittman & Pittman, 1979; Wortman & Brehm, 1975). Consistent with these analyses, in Kray et al.'s (2004) study of "stereotype reactance," such reactance occurred only if women had sufficient power to act, which supports the idea that reactance develops only if people feel capable of restoring their freedom. Thus reactance possesses energizing and behavior-directing properties when something to restore the freedom can be done (cf. Brehm & Brehm, 1981).

Although the intertwined model addresses anger, which is a motivational state, it refers to anger only as affect. However, as demonstrated by EEG studies, anger is approach motivational (e.g., Harmon-Jones, 2003, 2004; Harmon-Jones & Allen, 1998). Current EEG research supported this assumption, as well (Steindl, Jonas, et al., 2015). Thus, reactance is a state possessing a tremendous motivational force that induces undesirable outcomes such as disagreement or devaluation. Interestingly, most of the presented studies viewed reactance primarily as an undesirable factor that has to be eliminated or at least reduced. Several methods to reduce or prevent reactance have already been tested. For example, to perceive a message as less threatening, a restoration postscript telling participants that they are free to decide for themselves what is good for them can help (Bessarabova, Fink, & Turner, 2013; Miller et al., 2007). Moreover, if the threatened person takes the perspective of the threatening person (Steindl & Jonas, 2012) or if state empathy is induced by a persuasive message, reactance is lower (Shen, 2010). Another method is inoculation, which forewarns people of a potential threat. This strategy reduces the experienced threat and, consequently, reactance effects (Richards & Banas, 2015).

[3] In a second study, this result was moderated by dispositional reactance: Participants high in dispositional reactance solved fewer anagrams correctly if they were primed with the person who wanted them to work hard than if they were primed with the person who wanted them to relax. Interestingly, participants low in dispositional reactance showed the best performance if they were primed to work hard.


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However, in other cases, one could even make use of the motivational force of reactance. Paradoxical interventions, for example, use reactance to successfully reduce symptoms such as procrastination (for an overview see Miron & Brehm, 2006). Furthermore, reactance can produce both undesirable and desirable outcomes. It has been found, for example, that the experience of reactance can elicit heightened achievement motivation (Steindl & Jonas, 2014). Recent studies have also shown that the experience of reactance can be associated not just with negative feelings, such as anger, but also with activating positive affect, such as feeling strong and determined (Steindl, Jonas, et al., 2015). We invite future research to investigate the desirable motivational side of reactance in order to make use of its energizing probabilities.

## Implications and Suggestions for Future Research

About 50 years of research has provided many answers regarding the determinants of reactance, the subjective experience of reactance, the processes involved, and its consequences. Although Brehm and Brehm (1981) stated that reactance cannot be measured directly, research has found a way to do so. Studies have followed up on Miron and Brehm's (2006) idea of assessing the affective, cognitive, and physiological aspects of experiencing reactance (e.g., Jonas et al., 2009; Rains, 2013; Sittenthaler, Jonas, et al., 2015; Sittenthaler, Steindl, et al., 2015). Neuroscientific studies using EEG and functional magnetic resonance imaging (fMRI) have contributed to an even better grasp of the reactance phenomenon (Steindl, Jonas, et al., 2015; Steindl, Klackl, & Jonas, 2015).

These studies showed us that reactance is a state consisting of affective, cognitive, and motivational components. One affective as well as motivational facet of the experience is anger. As anger is typically understood as a negative emotion emerging when people are kept from reaching a desired goal (for an overview see Berkowitz & Harmon-Jones, 2004), one might wonder if reactance is the same as anger. Although anger is an important component of reactance and has been found to also evoke approach motivation (Harmon-Jones et al., 2013), studies have indicated that reactance also contains negative cognitions (e.g., Rains, 2013). To explore the nature of reactance and how it differs from anger, Steindl, Klackl, et al. (2015) used fMRI techniques to compare conditions in which participants read about reactance-arousing, anger-arousing, or neutral situations. During reactance-arousing compared to anger-arousing situations, the middle temporal lobe, the temporal poles, and the gyrus rectus were active. These regions have been shown to be involved in mentalizing processes in which people are drawing inferences about the mental states of others (Frith & Frith, 2003, 2006). This suggests one basis for distinguishing reactance processes from more pure anger processes, an issue that should be explored more carefully in future research.

Another interesting question for future research would be whether reactance motivation will always lead to efforts to restore freedom. According to motivational intensity theory (Brehm & Self, 1989; Brehm, Wright, Solomon, Silka, & Greenberg, 1983; Wright, 2008; Wright, Agtarap, & Mlynski, 2015; Wright & Brehm, 1989), the emerging effort people expend to restore their freedom depends on the difficulty of the required behavior. The more difficult the behavior, the more effort is invested, up to the point where it seems impossible to restore freedom. What happens to reactance arousal and striving if one cannot restore an eliminated freedom (see Miron & Brehm, 2006) is an open question. As Wright et al. (2015) suggested, more research is needed to better understand the role of perceived difficulty of freedom restoration in reactance striving.

In the context of persuasion, the intertwined model describing reactance as a combination of anger and negative cognition that further affect people's attitudes (Dillard & Shen, 2005; Kim et al., 2013; Rains, 2013) seems to be an important model for understanding the reactance process. However, it is unclear if this model generalizes to all reactance situations, that is, also to those outside the persuasion context. Studies using framing, vicarious, or legitimate freedom threats for eliciting reactance indicate two processes of reactance, a more impulsive emotional and a more reflective cognitive process. People seem to either react to the threat immediately or after a time delay with intermediary cognitions (e.g., Jonas et al., 2009; Sittenthaler, Jonas, et al., 2015; Sittenthaler, Steindl, et al., 2015). A study by Bessarabova and colleagues (2015) examining the process of reactance induced by guilt appeals found that in the context of guilt that the affective and cognitive reactance component did not correlate, which is in contrast to the intertwined model. However, in accordance with the intertwined model, both variables affected people's reactions to the perceived freedom threat. Yet, they did this via different routes. Whereas guilt directly affected the affective component of reactance (anger), it only indirectly affected the cognitive component of reactance (negative cognitions) via people's awareness that the message was a guilt appeal (Bessarabova, Turner, Fink, & Beary Blustein, 2015). The question of when and how different reactance models (dual-process vs. intertwined) apply seems to be a recent interest in reactance research and should further be explored in future studies.

Similar to the investigation of guilt, it would also be interesting for future research to take a closer look at the relation between reactance and other negative (and positive) emotions, like fear (or humor). Shen and colleagues (2015) looked at reactance processes resulting from fear appeals from a within subjects perspective and interestingly found that the presentation of humorous information can mitigate reactance and therefore improve the persuasiveness of a message (see Shen & Coles, 2015). De Lemus, Bukowski, Spears, and Telga (2015) provide more evidence that reactance threat can also result from perceived threats to one's groups and social identities. Specifically, they show that examples of stereotypic women arouse some reactance response in feminist women and examples of

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counterstereotypic women arouse reactance in more traditional women. Interventions in the context of health behaviors can also elicit reactance which might contribute to the often missing effects in the long term (Ungar, Sieverding, Schweizer, & Stadnitskia, 2015).

Furthermore, how do cognition and affect combine in different types of freedom threats? Is there a difference between restricting a freedom versus imposing an alternative, and if so, how does this difference affect emotional experience, cognition, motivation, and physiological arousal? Although it is difficult to explore these processes in real-world phenomena, it would be enormously enriching for reactance research.

As people are often threatened by other people, reactance plays a crucial role in interaction processes. In any social interaction, one person's reaction influences the other person's experience, behavior, and cognition, which in turn affects the first person, and so on (Steindl & Jonas, in press). Freedom threats are probably common in many social interactions. Customers may feel restricted by salespeople. Service providers may feel controlled by those they serve. Patients may feel constrained by doctors and therapists. Marital partners may perceive threats to their freedoms from their spouses. Future research might consider the dynamics of these reactance processes in a wide range of social contexts, to reach an understanding of how people's reactions to freedom threats mutually affect each other. The papers in the present volume hopefully both address these new questions and will serve to stimulate further efforts to do so.

## Conclusion

Since Miron and Brehm's (2006) review paper, research on psychological reactance has continued. Although our knowledge about this fascinating phenomenon has grown, the puzzle of reactance is not yet complete. As Miron and Brehm (2006) so aptly put it, we further "hope that future research will consider the various implications of the theory for real-world phenomena as well as continue revealing and testing its basic theoretical assumptions" (p. 16).

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