PENULTIMATE DRAFT OF: Paolini, S., & McIntyre, K. (in press, 2018). Bad is stronger than good for stigmatized, but not admired outgroups: Meta-analytical tests of intergroup valence asymmetry in individual-to-group generalization experiments. *Personality and Social Psychology Review.*

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Bad is Stronger than Good for Stigmatized, But Not Admired Outgroups: Meta-Analytical Tests of Intergroup Valence Asymmetry in Individual-to-Group Generalization Experiments

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Abstract

Theories of risk aversion, epistemic defense, and ingroup enhancement converge in predicting greater impact of negative (vs. positive) experiences with outgroup members on generalized evaluations of stigmatized outgroups. However, they diverge in predictions for admired outgroups. Past tests have focused on negative outgroups using correlational designs without a control group. Consequently, they have not distinguished between alternative explanations or ascertained the direction of causality/generalization, and they have suffered from self-selection biases. These limitations were redressed by a meta-analysis of experimental research on individual-to-group generalization with positive *and* negative outgroups (59 tests; 3,012 participants). Controlling for modest confounds, the meta-analysis found a generalization advantage of negative experiences for stigmatized outgroups and a generalization advantage of positive experiences for admired outgroups. These results highlight the centrality of valenced expectations about outgroups, consistent with epistemic defense and ingroup enhancement and inconsistent with risk aversion. Implications for positive changes in intergroup dynamics are discussed.

Keywords (8): valence asymmetry, negative intergroup contact, prejudice and stereotype change and maintenance, risk appraisal, schema consistency, self-enhancement, self-categorization theory, individual-to-group generalization.

Intergroup conflict, intergroup animosity, and prejudice have been at the core of social psychological analyses for over a century (Allport, 1954; Sherif, 1966). Interests in corrective interventions have legitimately fueled a focus on the beneficial effects of positive experiences with outgroup members and steered research attention away from the damaging consequences of negative experiences and negative knowledge. However, accurate and realistic predictions for positive changes in intergroup relations under variable conditions require a fuller and unbiased understanding of both positive *and* negative outgroup experiences: a recognition of their unequal prevalence in diverse settings, unique determinants, and differential impact on cognition, affect, and behavior.

In redressing these research trends, a model of intergroup valence asymmetries has recently advanced the simple idea that bad might be stronger than good in intergroup relations (a negative 'intergroup valence asymmetry'; Paolini, Harwood, & Rubin, 2010; see also Barlow et al., 2012) because negative experiences with outgroup members cause larger changes in outgroup evaluations (e.g., group-level prejudice, stereotyping, etc.) than positive experiences with outgroup members do. The main aim of this review article is to put this simple but significant prediction to stringent empirical test and check whether negative valence asymmetries are psychologically invariant across intergroup settings or not.

To this end, we start by reviewing direct tests of valence asymmetry in outgroup evaluations (see Table 1) and demonstrate that the evidence is, to date, inconsistent and inconclusive. As these findings stem from correlational research on intergroup contact in the field, they are likely subject to self-selection biases and reverse causation—hence need complementing with experimental findings. Critically, in this contribution, we also argue that, because past tests focused on responses to negatively valued or stigmatized outgroups, they do not distinguish between explanations of intergroup valence asymmetry in terms of risk aversion, epistemic defense, or ingroup enhancement—contrasting these explanations

both theoretically and empirically is one of the focal aims of this research.

In this investigation, we resolve issues of self-selection, reverse causation, and ambiguous explanations of intergroup valence asymmetries in past correlational field tests by turning our attention to a traditionally separate research literature: We meta-analytically analyze findings from past laboratory-based research on individual-to-group generalization (see Table 3). This fresh approach assists us (a) to establish with greater confidence whether intergroup evaluations are invariably afflicted by a disproportionate impact of bad experiences with outgroup members, (b) to contrast explanations of intergroup valence asymmetry based on risk aversion, epistemic defense, and ingroup enhancement, thus shedding new light on the motivational underpinnings of these effects, and (c) to provide a firmer basis to design prejudice-reduction interventions and predict trajectories of change in new and untested intergroup settings.

Negative Valence Asymmetries in Intergroup Relations

Due to a focus on corrective interventions, social psychological analyses have shied away from studying the effects of negative experiences with outgroup members and have disregarded direct comparisons of negative (vs. positive) experiences' impact on outgroup evaluations (Bodenhausen, Schwarz, Bless, & Wänke, 1995; Graf & Paolini, 2017; McKeown & Dixon, in press; Pettigrew & Tropp, 2006). Yet, various lines of enquiry suggest the existence of *negative valence asymmetries in influence or impact* (vs. prevalence or preference; Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Fiske, 1980; Rozin & Royzman, 2001): While positive experiences might be more prevalent in people's daily experience (Pettigrew, 2008) and might be preferred over negative experiences by most individuals (Husnu & Paolini, in press), bad experiences with outgroup members would be more *influential* or have greater impact on intergroup affect, cognitions and behaviors than positive outgroup experiences. These negative valence asymmetries in influence or impact

are important; if corroborated empirically, they would contribute to explaining the endurance of intergroup friction in society and help in addressing the negative trajectories of change in intergroup dynamics that we sadly witness in our troubled modern world.

Perception of Outgroup Members

Established traditions of research in areas with obvious implications for intergroup psychology indicate that bad is stronger than good in many aspects of information processing (for reviews, Baumeister et al., 2001; Fiske, 1980; Rozin & Royzman, 2001; Skowronski & Carlston, 1989). Extensive evidence from person perception research, for instance, tells us that people often spend more time (Fiske, 1980) and more conscious time (Ohira, Winton, & Oyama, 1998) processing negative, than positive behaviors. Negative behaviors elicit more spontaneous (Weiner, 1985) and dispositional attributions (Ybarra & Stephan, 1999). Similarly, negative personal traits regularly attract more attention than positive personal traits (Pratto & John, 1991), carry more weight when forming first impressions, and result in impressions that are held with greater confidence (Hamilton & Zanna, 1972). Once established, negative impressions are more resistant to change: They require less evidence to be confirmed and more evidence to be disconfirmed (Rothbart & Park, 1986; however, see moderating evidence later). Similar negative valence asymmetries apply to memory, with negative items and their source often being better recognized (Robinson-Riegler & Winton, 1996) and recalled than positive items and their sources (Skowronski & Carlston, 1987).

Yet, as we discuss more extensively later, these effects are not invariant. Several scholars have discussed various violations of the 'bad is stronger than good' rule in terms of *positive* valence asymmetries in prevalence and preference (e.g., Baumeister et al., 2001; Graf, Paolini, & Rubin, 2014; Rozin & Royzman, 2001). There are three distinguishable types of valence asymmetry: Valence asymmetries in *preference* refer to the uneven liking and active search for positive vs. negative items (e.g., choosing to engage in positive, rather

than negative experiences with outgroup members when some individual control over these choices exists; Husnu & Paolini, in press). Valence asymmetries in *prevalence* refer to the uneven prevalence or representation of positive and negative items in a set domain (e.g., findings of greater frequency of positive, than negative experiences with outgroups in people's accounts of past contact; Pettigrew, 2008). Valence asymmetries in *influence* or impact—the focus of the present contribution—refer to the uneven influence or impact on judgment and decision of positive and negative items (e.g., negative experiences with outgroups shape outgroup evaluations more than positive experiences do; Barlow et al., 2012). Several moderators of valence asymmetries have been isolated in language, perception and memory research, as well as in several other areas of psychology; Table 2 provides a snapshot of this background literature. Evidence of positive reversals, however, is to date more common on indicators of preference and prevalence, than on indicators of impact; we return to some of these complexities later.

These negativity biases have some straightforward intergroup parallels. Research on illusory correlation, for instance, indicates that distinctive (i.e., infrequent) negative behaviors offer a firmer basis for stereotype formation, than distinctive positive or neutral behaviors do because they instigate stronger illusory correlations between group membership (ingroup vs. outgroup) and behavior valence (positive vs. negative; see meta-analysis by Mullen & Johnson, 1990). Negative outgroup behaviors also often earn a memory advantage over positive outgroup behaviors. For example, in a study of lab-created minimal groups, Howard and Rothbart (1980) found that participants were more accurate at recognizing negative outgroup behaviors than positive outgroup behaviors; a reverse pattern was observed for behaviors by ingroup members.

Altogether the evidence base suggests that negative experiences with outgroup members may have greater impact on people's cognitions and evaluations of these

individuals than positive experiences have. However, for negative valence asymmetries to impact on broad intergroup relations, their reach needs to extend beyond responses to individual outgroup members and affect people's reactions to outgroups as a whole—or group-level or generalized outgroup evaluations (Brown & Hewstone, 2005).

Generalized Outgroup Evaluations

Direct investigations of valence asymmetries in generalized outgroup evaluations are recent (e.g., Dhont & Van Hiel, 2009; Pettigrew, 2008; see studies in Table 1). In this new arena, Paolini, Harwood, and Rubin (2010) have advanced a model of valence asymmetry in intergroup relations that integrates contributions from past research on intergroup contact and categorization. This model hypothesizes that generalized outgroup evaluations are affected more heavily by negative, than positive experiences with individual outgroup members because negative (vs. positive) experiences cause a disproportionate attendance to intergroup categorizations or 'high category salience'.

It is well established in the intergroup contact literature that attending to ingroup-outgroup distinctions is pivotal to the process of individual-to-group generalization (Brown & Hewstone, 2005; Gaertner & Dovidio, 2000): Experiences with individual outgroup members affect, or 'generalize' to evaluations of the outgroup as a whole more heavily when people attend to the intergroup distinction (i.e., category salience is high), than when they do not (i.e., category salience is low; e.g., Wilder, 1984). This is because, under high category salience, the group members involved in the intergroup exchange are 'treated' as group representatives (i.e., typical of the outgroup) and, thus, serve as a suitable basis to infer the characteristics of the whole group (Rothbart & John, 1985; see also Brown & Hewstone, 2005). Category salience however is not invariably high in all experiences with outgroup members; it should be moderated by valence. According to functional categorization theories (Bruner, 1957; Oakes, Haslam & Turner, 1994), category salience is high when discrete

experiences with group members are congruent with pre-existing expectations about the group; it is low when discrete experiences with group members are incongruent with pre-existing expectations about the group. Because of generally negative expectations about outgroups in stigmatizing contexts (Reynolds, Turner, & Haslam, 2000), experiences with negative outgroup members should boost category salience and, as a result, generalize to group evaluations more; whereas positive outgroup experiences should mute category salience and thus have limited generalization potential (Brown & Hewstone, 2005).

Drawing these expansive literatures together, Paolini and colleagues' (2010) model predicts negative intergroup valence asymmetries in impact or influence: Negative experiences with outgroup members should cause large worsening (i.e., negative changes) in outgroup evaluations and positive experiences produce only slim improvements (or positive changes) in stigmatizing contexts when people hold negative expectations of outgroups because negative outgroup experiences encourage attending to the intergroup distinction, whereas positive outgroup experiences dampen such intergroup distinctions (see also Gaertner, Dovidio, Anastasio, Bachman, & Rust. 1993; Gaertner & Dovidio, 2000).

In the next section, we demonstrate that there is consistent and convincing evidence for negative valence asymmetries in intergroup categorizations; evidence however is still suboptimal and inconclusive with regards to negative valence asymmetries in generalized changes in outgroup evaluations. We note that psychological research on valence asymmetry has identified a variety of potential moderators; our empirical efforts around intergroup dynamics will then center on a key factor for intergroup psychology (aka outgroup valence) and enlarge its focus to additional moderators only for ancillary analyses.

Past Direct Tests of Intergroup Valence Asymmetry Return

Mixed Findings and Unexplained Variance

Negative valence asymmetries in social categorization are well established.

In the intergroup contact literature, experimental and longitudinal data now indicate that negative contact with outgroup members causes greater attendance to the intergroup category distinctions; whereas positive, as well as less negative contact dampens intergroup categorizations in favor of more inclusive categorizations or individuated perceptions (see Gaertner & Dovidio, 2000; Gaertner et al., 1993; Greenland & Brown, 1999; Paolini et al., 2010 for experimental and longitudinal findings and a review of early correlational data). Heightened intergroup categorizations under negative (vs. positive) contact have been documented in prospective and retrospective face-to-face contact in peaceful (e.g., Gartner et al., 1993; Paolini et al., 2010), as well as in conflict-ridden contexts (Paolini et al., 2014). Similar negative asymmetries in categorization are reported in experimental lab-based studies on stereotyping where there is greater control over the exact information that participants receive about the outgroup members (e.g., Lepore & Brown, 1997; Richeson & Trawalter, 2005; Wittenbrink, Judd, & Park, 1997); here individuals are found to be faster and more accurate at categorizing negative, than positive outgroup members. These negative asymmetries extend to intergroup categorizations in television-mediated and imagined contact with outgroup members (Paolini et al., 2014), and are present in a variety of settings, including those defined along ethnicity, age, nationality, and minimal groups.

Valence asymmetries in generalized evaluations of outgroups have also been investigated, but typically with cross-sectional correlational designs (however, see Deegan, Hehman, Gaertner, & Dovidio, 2015; Hayward, Tropp, Hornsey, & Barlow, 2017; Stark, Flache, & Veenstra, 2013). In correlational data published by Barlow and colleagues (2012) for instance, negative experiences (and positive experiences) with outgroup members independently predicted racism (and lack thereof) across eight Australian and American samples from three independent research laboratories. Critically, consistent with the intergroup valence asymmetry model, negative experiences were a stronger predictor of

worse outgroup attitudes than positive contact experiences were of better outgroup attitudes. Other research laboratories have found similar correlational evidence of negative valence asymmetry in generalized outgroup evaluations (see 'NA' entries under 'asymmetry' in Table 1 summary of published research).

Insert Table 1 about here

There is, however, published research that is inconsistent with predictions of negative valence asymmetry: This other research shows either *no* evidence of valence asymmetry in outgroup evaluations (see entries 'noA' under 'asymmetry' in Table 1) or even evidence of reversals (i.e., *positive* valence asymmetries; see 'PA' under 'asymmetry' in Table 1). Stark and colleagues' (2013) sole longitudinal Study 2, for example, found that disliking of ethnic school mates in the classroom predicted worsened ethnic outgroup attitudes over time to the same extent that liking of other ethnic school mates predicted improved ethnic outgroup attitudes. Pettigrew's (2008) analyses of a large representative sample from Germany (see also Pettigrew & Tropp, 2011), on the other hand, showed that behavioral markers of positive contact with foreigners (e.g., receiving help; having an interesting conversation) were more, and not less, strongly associated to a measure of outgroup prejudice than behavioral markers of negative contact (e.g., being pestered; feeling irritated). Direct tests of valence asymmetry in outgroup evaluations, therefore, return mixed results and the variability in these findings remains largely unexplained.

Greater progress in identifying significant moderators of valence asymmetries has been made by research in other areas of psychology (see Table 2 for an overview). Type of trait judgment has emerged as a potentially important factor (Skowronski & Carlston, 1987; 1992): High-ability traits (e.g., scientifically-minded, intelligent, etc.) have been found to

violate the pattern of few-instances-to-confirm/many-to-disconfirm displayed by highly unfavorable traits (see Rothbart & Park, 1986, p. 138; see also Reeder, Messick, & van Avermaet, 1977; Reeder, 1979). There are also some notable exceptions to negativity biases in attention and memory: People at times do not attend to negative feedback (e.g., Baumeister & Cairns, 1992; Korn, Rosenblau, Buritica, & Heekeren, 2016) and, as illustrated by the phenomenon of mnemic neglect, may selectively forget such feedback (e.g., Mischel, Ebbesen, & Zeiss, 1976; Sedikides & Green, 2000). Negative information can be lost in memory because of selective retrieval-induced forgetting (Sedikides, Green, Saunders, Skowronski, & Zengel, 2016), or because this information loses its 'emotional punch' over time, compared to positive information (the fading affect bias; for a review, see Skowronski, Walker, Henderson, & Bond, 2014). These moderating effects of time are consistent with Taylor's (1991) mobilization/minimization theory, which suggests that 'bad' might provoke stronger initial reactions than 'good' (or 'mobilization'), but those negative reactions might dampen (or be 'minimized') across time due to a variety of biological, social, and cognitive factors. Some group impression formation studies return similar complexity (e.g., McConnell, Sherman, & Hamilton, 1997; Skowronski, 2002) and suggest that perceptions of group's (and individual targets') entitativity might regulate switches between negativity and positivity biases. Table 2 summarizes some of the research that has identified moderators of valence asymmetry in these other areas of psychology, which might have relevance for *intergroup* valence asymmetries.

Insert Table 2 about here

Based on these moderation studies, violations to the 'bad is stronger than good' rule are to be expected: Whether negative valence asymmetries, attenuations of these negative

asymmetries (see entries 'NA' and 'NA: moderators' under 'asymmetries and moderators' in Table 2), or positive reversals occur (see entries 'PA' and 'PA: moderators' in Table 2), might depend on a complex combination of stimuli, context, task, and target. Yet the relevance and implication of these specific moderators—on their own or in combination—for asymmetries in generalized outgroup evaluations remains to be established. Moreover, as noted previously, early and largely independent reviews (Baumeister et al., 2001; Rozin & Royzman, 2001) indicated that moderation of negative valence asymmetries and their reversals are more common on indicators of prevalence and preference, than on measures of impact or influence that we focus on here (see 'type of symmetry' in Table 2).

Past efforts at testing intergroup valence asymmetries have been especially limited by a focus on stigmatized, negative outgroups. Hence, they have failed to ascertain the moderating effects of outgroup valence, a factor central to much intergroup psychology (e.g., Fiske, Cuddy, Glick, & Xu, 2002; Mackie, Smith, & Ray, 2008; Oakes et al., 1994). In the next section, we argue that this specific research bias not only limits results' generalizability, it also prevents distinguishing between three key motivational explanations for valence asymmetries in intergroup settings.

Untested Explanations for Intergroup Valence Asymmetry

In this research, our focal interest is in outgroup valence. We assess moderation of valence asymmetry in impact by negative, stigmatized outgroups vs. positive, admired outgroups (see also Fiske et al., 2002; Mackie et al., 2008; Oakes et al., 1994) in an attempt to initiate a systematic investigation of sources of variance in direct tests of intergroup valence asymmetry, as well as in an attempt to identify key motivational underpinnings of these effects. Considerations about the motivating influence of risk aversion, individuals' desire for epistemic defense, and ingroup enhancement permeate vast and diverse areas of

psychological theorizing and research (Wright, 2001); here, we zoom in to test their implication in intergroup valence asymmetries. We will argue that explanations of valence asymmetry in terms of risk aversion, epistemic defense, and ingroup enhancement converge in predicting negative valence asymmetries in negative, stigmatizing outgroup domains, but diverge in their predictions for positive, admired outgroups.

Risk aversion is a fundamental motivational drive for all living organisms according to several prominent biological and biology-derived theories, like risk sensitivity theory, risk aversion theory, and life history theory (e.g., Bateson, 2002; Del Giudice, Gangestad, & Kaplan, 2015; Öhman & Mineka, 2001; see Rozin & Royzman, 2001 for an overview). From this stance, negative valence asymmetries in influence or impact are built-in predispositions shared by both animals and humans to minimize threatening stimuli, maximize survival and the integrity of the organism. In humans, these negative biases would serve adaptive self-regulation: Increase the organisms' ability to detect problems in the environment, engage in changes to the self or the environment for increased flexibility, and increased ability to maintain or re-instate positive and stable environments (Baumeister et al., 2001; Rozin & Royzman, 2001; Taylor, 1991). Ultimately, bad should be stronger than good because there are typically many opportunities in one's ontogenesis to achieve positive rewards (e.g., reproduce). Instead, as far as death is final and irreversible, there is limited room for gradual learning and mistakes in avoiding survival-threatening experiences. Hence, from a risk aversion stance, missing out on some rewards, like positive experiences with outgroup members, while disappointing, would not necessarily restrict future gains; whilst failing to avoid a negative experience, like the one with a threatening outgroup member, might result in death and thus should have prime attention within evolved biological systems (for related discussions see Baumeister et al., 2001; Neuberg, Kenrick, & Schaller, 2011; Öhman & Mineka, 2001). Extending this reasoning to biological and social systems (Peeters &

Czapinski, 1990), these negative biases at the individual component level should guarantee that the system does not fault, ultimately, ensuring survival, safety, and flexible stability.

Risk aversion explanations for avoiding harm are prominent in biology and biology-inspired psychological theories; risk appraisals are however central also in many psychological and social psychological analyses. For example, Maslow's motivational theory (Maslow, Frager, & Cox, 1970) proposes that primary and more basic motivations implicate escaping from aversive states (e.g., danger, hunger, and cold) and positive motivators (e.g., seeking positive esteem, love, or self-actualization) will direct behaviors only when 'deficiency' motives have been satisfied. Similarly, there is now a copious literature on the centrality of intergroup anxiety in intergroup dynamics (for reviews, Paolini, Harris, & Griffin, 2016; Stephan, 2014) and extensive evidence supports an intergroup threat theory (Stephan & Stephan, 2000).

To some degree irrespective of disciplinary roots or unique features, theories centered on risk aversion place a special premium on the role that stimulus valence plays in valence asymmetries (for a similar point, Baumeister et al., 2001). While they recognize contextual and dispositional moderators that contribute to response variability (Rozin & Royzman, 2001; Neuberg et al., 2011; e.g., variability and uncertainty in risk-reward appraisals, age- and gender differences linked to reproductive capacity; e.g., Griskevicius, Tybur, Delton, & Robertson, 2011; Wang, 1996), negative stimuli are expected to be more consequential than positive stimuli *in most circumstances*. This is because, as Neuberg and colleagues (2011) noted, evolved precautionary systems in animals and humans are "biased in a risk-averse manner, erring toward pre-cautionary responses even when available cues only heuristically (and often wrongly) imply threat" (p. 1043).

Hence, as far as negative valence asymmetries equip the organism for adaptive responses to potential threats from the environment, negative stimuli—including negative

outgroup members and negative experiences with outgroup members—should *typically* enjoy a processing advantage (i.e., more attention, richer encoding, etc.) over positive stimuli in most settings. This should translate into a general or overall negative valence asymmetry across outgroup domains.

Negative valence asymmetries can be evident in negative, stigmatizing outgroup domains however, also due to qualitatively different motivational forces, including *epistemic defense* and *ingroup enhancement*. Many prominent scholars with a focal interest in these motivating factors have explained valence asymmetries in psychology and intergroup dynamics in terms of an evaluative fit mechanism or a congruence principle, whereby good goes with good and bad goes with bad (e.g., Abelson et al., 1968; Bruner, 1957; Coates, Latu, & Haydel, 2006; Harmon-Jones, 2002, 2004; Reynolds et al., 2000; Roets, Kruglanski, Kossowska, Pierro, & Hong, 2015; Rothbart, Evans, & Fulero, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987)[1]. From this stance, negative experiences with outgroup members should be psychologically more influential than positive experiences with outgroup members because negative outgroup experiences *fit, or confirm* people's general *expectations* that outgroups and experiences with outgroup members are negative.

According to schema congruency theorists (e.g., Abelson et al., 1968; Bruner, 1957, Roets et al. 2015; Rothbart et al., 1979), evaluative fit (and the resulting valence asymmetries) would reflect epistemic defense: the individual's desire to maintain knowledge structures about the world unchanged, including valenced knowledge structures about social groups, like prejudices and stereotypes. Self-categorization and social identity theorists *build on* this epistemic defense motive to argue that evaluative fit and valence asymmetries also reflect individuals' motivation for positive ingroup distinctiveness and group-based self-enhancement are also at stake (Coates et al., 2006; Reynolds et al., 2000; Tajfel, 1981; Turner et al., 1987). Hence, in addition to protecting group knowledge structures, valence

asymmetries should support a motivation to feel good about the ingroup[2], and the self as ingroup member (hence, *ingroup self*-enhancement; Doosje, Haslam, Spears, Oakes, & Koomen, 1998; Martiny & Rubin, 2016; Rubin, & Hewstone, 1998; Spears & Manstead, 1989).

Regardless of whether driven by epistemic defense and/or ingroup enhancement, because explanations of valence asymmetries in terms of evaluative fit are grounded in psychological expectations, these explanations are particularly equipped to account for malleable and context dependent valence asymmetries (see also Baumeister et al., 2001): As expectations about groups change (e.g., from negative to positive, or reverse), negative asymmetries should also change—i.e., sometimes reducing, sometimes cancelling out, and sometimes even reversing.

Differences in the exact motivational underpinning of these effects however, lend themselves to slightly different predictions about where greater resistance, or potential for positive changes in intergroup relations occur. If intergroup valence asymmetries and evaluative fit effects reflect a purely epistemic defense motive, their magnitude (vs. direction) should be similar in positive and negative outgroup domains. In other words, negative asymmetries in negative outgroup domains should be as large as positive valence asymmetries in positive outgroup domains (i.e., a *symmetrical* dis-ordinal interaction between outgroup valence and experience valence). If valence asymmetries and evaluative fit, on the other hand, also reflect an ingroup enhancing motive, then valence asymmetries and evaluative fit effects should be skewed towards maintaining a partisan outlook of intergroup relations (i.e., negative views of the outgroup and positive views of the ingroup): The compounding influence of epistemic defense and ingroup enhancement should result in negative valence asymmetries in negative outgroup domains being larger than positive valence asymmetries in positive outgroup domains. In statistical terms, this should be

represented by an *asymmetrical* dis-ordinal interaction between outgroup valence and experience valence, possibly so pronounced to result also in a main effect of experience valence favoring negative outgroup experiences. In other words, based on theories centered on an ingroup enhancement motive, the difference in generalization effects between negative (vs. positive) experiences with members of negative outgroups should be larger than the difference in generalizations between positive (vs. negative) experiences with members of positive outgroups. This is because positive ingroup distinctiveness is easier to achieve or maintain, thus ingroup enhancement motives are easier to satisfy when the ingroup is surrounded by many negative outgroups and relatively few positive outgroups[3]. To achieve this desirable outcome, individuals driven by ingroup enhancement considerations should be particularly ready to revise their outgroup views for the worse (i.e., main effect of experience valence). They should be particularly reluctant to accommodate positive changes in outgroup evaluations after positive experiences with outgroup members, especially when these individuals belong to positive, admired outgroups (i.e., dis-ordinal interaction). While theoretically distinct, epistemic defense and ingroup enhancement accounts are notoriously difficult to discriminate empirically (see e.g., Kunda & Sinclair, 1999; Kruglanski, 2013; Roets et al., 2015); we will explore whether one prevails over the other in this research.

Figure 1 contrasts predictions for intergroup valence asymmetry based on risk aversion, epistemic defense, and ingroup enhancement (cf. Figure 1's top-middle-bottom panes). It shows how these theoretical accounts converge in their predictions for negative, stigmatized outgroups (cf. Figure 1's left-sides): All accounts predict negative valence asymmetries in these settings in terms of larger changes in generalized outgroup evaluations after negative, than positive experiences with individual members of these groups. Hence, tests that focus on negative outgroups (see Table 1) cannot logically distinguish between alternative explanations for valence asymmetry.

These three motivational accounts however *diverge* in their predictions for positive, admired outgroups (cf. Figure 1's right-sides): Theories with a focus on risk aversion, like risk sensitivity, risk aversion theories and influential evolutionary explanations of prejudice and stigma, still predict negative valence asymmetries in these settings, albeit perhaps smaller in size than in negative outgroup domains (e.g., Neuberg et al., 2011). Theories with a focus on epistemic defense or ingroup enhancement, on the other hand, predict a reversal – i.e., a *positive* valence asymmetry under positive outgroup domains. According to these perspectives, including schema congruence theories, social identity and self-categorization theories, changes in generalized evaluations of positive, admired outgroups should be larger after positive, than negative experiences with individual members of these positive and admired groups (i.e., an evaluative fit effect). As we noted earlier, these two perspectives differ in their predictions for the magnitude of these positive asymmetries (i.e., larg*er* asymmetries for epistemic defense accounts, and small*er* for ingroup enhancement accounts).

Insert Figure 1 about here

To date no available *direct* test of valence asymmetry in outgroup evaluations allows an incisive, competing assessment of these three alternate explanations. This is because even the studies that have recently tried to rectify the positivity bias of past contact research by investigating and comparing positive *and negative* experiences with outgroup members have all been limited by a focus on negative, stigmatized outgroups[4]—see 'target outgroup' in Table 1. Without stringent and direct tests of valence asymmetry in positive or admired outgroup domains, there cannot be clarity over the exact motivational underpinning of intergroup valence asymmetries (i.e., risk aversion towards organism integrity vs. knowledge structure maintenance vs. ingroup self-enhancement), there cannot be precision in predictions

for novel and untested intergroup settings and there is no assured and consistent effectiveness of associated interventions.

Methodological Limitations of Past Research and This Meta-Analysis

Besides failing to adequately sample variations in outgroup valence, past direct field tests of intergroup valence asymmetry are afflicted by several other important methodological weaknesses that significantly jeopardize confidence in findings for and against the existence of intergroup valence asymmetries. These limitations include the correlational nature of these studies' designs, the lack of control conditions, and their susceptibility to self-selection biases.

The correlational nature of past tests' designs and the lack of control groups hinder firm conclusions about direction of causality (Hayward et al., 2017) and limit clarity over the magnitude and the nature of the changes in outgroup evaluations that are instigated by valenced experiences with individual outgroup members (Deegan et al., 2015). Hence, these tests are inconclusive with regards to whether negative experiences with outgroup members cause more prejudice and/or more prejudice causes more negative outgroup experiences. Because these cross-sectional correlational studies lack a control group—e.g., a baseline for outgroup evaluations or a condition without novel experience with individual outgroup members—these studies do not capture generalized *changes* or differences in outgroup evaluations relative to an established baseline. They rather assess mere co-variations between valenced experiences with individual outgroup members and outgroup evaluations at a specific point in time. Hence, these tests fail to indicate whether outgroup evaluations are improved or worsened after novel valenced experiences with individual outgroup members and fall short of quantifying how much these evaluations are improved/worsened. As such, these tests are unable to test the process at the core of the intergroup valence asymmetry model (Paolini et al., 2010; see also Deegan et al., 2015).

This interpretative ambiguity is further compounded by self-selection biases likely affecting correlational (vs. experimental) evidence. There are good reasons to believe that especially prejudiced and ideologically intolerant individuals naturally avoid intergroup contact (Hodson, 2008; Pettigrew, 2008). Research by Dhont and Van Hiel (2009), for example, shows that individuals with an authoritarian personality (vs. non-authoritarians) report more frequent negative outgroup experiences and less frequent positive experiences. Hence, tests of valence asymmetry that rely on measured (vs. manipulated) positive and negative experiences with outgroup members in natural settings are imprecise as they are potentially confounded by a host of individual differences in intergroup attitudes and histories of contact, as well as by the degree to which the outgroup experience is freely entered (or not) by the individual (see Bekhuis, Ruiter, & Coenders, 2013; Hodson, 2008; see also Harris & Hahn, 2011; Weinstein, 1980).

Drawing from the analysis so far, it is clear that a rigorous assessment of intergroup valence asymmetries requires first and foremost an experimental paradigm. Experimental paradigms prevent self-selection biases by randomly assigning individuals with varied intergroup attitudes, ideological orientations, and motivations to seek/avoid intergroup contact to controlled positive (vs. negative) experiences with outgroup members. In so doing, they offer firm ground for stringent causal inferences that go *from* the valence of the experience with specific outgroup members *to* evaluations of the outgroup, rather than vice versa. We found the critical evidence that was needed for an incisive test of valence asymmetry in *both* negative *and* positive outgroup domains in past experimental, laboratory-based research on individual-to-group generalization using impression formation paradigms.

Impression Formation Experiments

Laboratory-based experimental research using impression formation paradigms (Garcia-Marques & Mackie, 1999) is ideally suited for this job. These experiments

investigate the extent to which outgroup evaluations change to reflect one's experience with individual outgroup members (or individual-to-group generalization; Brown & Hewstone, 2005). To achieve this, participants are asked to develop impressions of unfamiliar/novel outgroup members and then to provide evaluations of the outgroup as a whole. The inclusion in these designs of either a pre-treatment baseline, a control condition that learns about stereotype confirming outgroup members, or that does not undergo any novel outgroup experience (i.e., a dependent measures-only condition) allows to quantify the magnitude and direction of changes in outgroup evaluations after these novel outgroup experiences. Experimental studies using impression formation paradigms were included in our meta-analysis and are summarized in Table 3.

In order to discriminate explanations of valence asymmetry based on risk aversion, epistemic defense, and ingroup enhancement, individual-to-group generalizations need to be assessed in both negative and positive outgroup domains. Due to an established interest in basic processes in this experimental (vs. contact) literature, experiments using impression formation paradigms have been carried out looking at both negative and/or positive outgroups (see 'outgroup stereotype' entries in Table 3). The only issue with this line of experimental research is that its original focus is not valence (Bodenhausen et al., 1995). This research traditionally investigates whether individual outgroup members fit descriptively (trait-to-trait) or not the outgroup stereotype and change it as a result (descriptive fit/misfit between outgroup members and outgroup representations; Jackson & Sullivan, 1988; Paolini, Hewstone, Rubin, & Pay, 2004; McIntyre, Paolini, & Hewstone, 2017; cf. Bodenhausen et al., 1995). This is where *meta-analytic syntheses* are particularly useful as these analytical tools are capable of extending their reach to variables that were *not* the original focus of the primary sources.

Hence, we sought experiments that used an impression formation paradigm to

quantify generalized changes in outgroup evaluations after exposure to information about individual outgroup members and coded these studies for whether they provided participants with positive or negative information about individual outgroup members (*experience valence*: positive/negative; see 'EVal' in Table 3) and for whether they focused on an outgroup stereotype of positive or negative valence (*outgroup valence*: positive/negative; see 'OVal' in Table 3).

Summary of Hypotheses

This pool of impression formation experiments allowed us to put to empirical test the competing predictions for individual-to-group generalizations following novel valenced experiences with individual outgroup members of risk aversion, epistemic defense, and ingroup enhancement explanations, as displayed in Figure 1. These predictions are also summarized in Table 4.

Insert Table 4 about here

Explanations of intergroup valence asymmetries centered on risk aversion would be supported if our meta-analysis returns a robust main effect of experience valence, either unqualified by outgroup valence or only weakly qualified by an ordinal interaction with outgroup valence. This pattern would be indicative of an overall generalization advantage of negative (vs. positive) experiences that is dulled, but possibly not completely removed, when the outgroup carries positive currencies or risk appraisals are less readily accessible (e.g., Griskevicius et al., 2011; Wang, 1996; see Baumeister et al., 2001; Neuberg et al., 2011).

Evaluative fit explanations, instead, would be supported if the meta-analysis returns a *dis*-ordinal interaction between outgroup valence and experience valence indicative of evaluative fit. These explanations would be corroborated if we find larger generalized

changes in outgroup evaluations in negative outgroup-negative experience experiments and in positive outgroup-positive experience experiments (evaluative *fit*), and smaller generalized changes in positive outgroup- negative experience experiments and in negative outgroup-positive experience experiments (evaluative *mis-fit*).

The shape of this dis-ordinal interaction between outgroup valence and experience valence has the potential to distinguish between epistemic defense and ingroup enhancement explanations. A *symmetrical* dis-ordinal interaction would indicate the psychological centrality of an epistemic motive for schema consistency in intergroup valence asymmetries that manifests itself with similar strength in positive and in negative outgroup domains. An *asymmetrical* dis-ordinal interaction that is biased towards negativity would be indicative of the compounding influence of ingroup-enhancement motives (aka. with amplified impact of negative outgroup experiences and dulled impact of positive outgroup experiences for positive, admired outgroups). When these are sufficiently strong, negative valence asymmetries for negative outgroups should be stronger than positive valence asymmetries for positive outgroups and translate *also* in a main effect of experience valence (i.e., a general/overall negative valence asymmetry).

Additional Design Parameters

Besides testing outgroup valence as a key moderator of the effects of valenced outgroup experiences on generalized changes, in this meta-analysis we assessed further sources of variability in individual-to-group generalization and checked the extent to which they contributed to the focal valence asymmetries. Hence, we coded and tested additional design parameters as proxies of nine variables of interest. In these ancillary analyses, we ascertained whether these variables (a) moderated the size of individual-to-group generalizations (see also McIntyre et al., 2017), (b) co-varied in any meaningful way with our focal design factors (outgroup / experience valence), and most importantly when accounted

for (c) increased our ability to identify the intergroup valence asymmetries at the centre of our key meta-analytical tests. We provide below a succinct discussion of these parameters and ancillary variables.

Type of experience. In impression formation experiments, experiences with outgroup members are deployed in various modalities: visual, audio, or written. These different experiences vary in richness, self-involvement, and affective-cognitive basis.

Harwood (2010) has systematically organised qualitatively different experiences with outgroup members in a bi-dimensional 'contact space', defined by a 'richness' and a 'self-involvement' dimension. The richness dimension captures variations in the number of communication cues (e.g., verbal/non-verbal) and sensory channels involved in the experience (e.g., ears/eyes; high richness: face-to-face contact; lower: imagined contact). The self-involvement dimension captures the extent to which the self is implicated (or not) in the experience (e.g., high: face-to-face contact vs. lower: observation of contact between an outgroup member and an ingroup stranger). It is plausible to regard type of experience, as we coded it in our analyses, as covarying along these two dimensions, with visual experiences scoring highest on both richness and self-involvement dimensions; written experiences scoring lowest on both, and audio experiences falling somewhere between. From a distinct but complimentary theoretical angle, type of experience also maps onto meaningful variations in the affective vs. cognitive basis of experience with outgroup members (see Paolini, Hewstone, & Cairns, 2007), with visual experiences at the most affective pole and written experiences at the most cognitive. Harwood's analysis posits that individual-to-group generalization in different areas of this 'contact space' should be governed by qualitatively different classes of variables. Our ancillary meta-analysis will ascertain whether this design parameter makes a difference to the generalization effects.

Type of outgroup and outgroup status. We classified target outgroups in eligible studies as based on ethnicity/nationality, ageing or disability, student groups, occupations, or 'other'. Type of outgroup significantly moderated individual-to-group generalizations in Pettigrew and Tropp's (2006) meta-analysis of contact, with average effect sizes for race and ethnicity outgroups, smaller than average effects for mental illness and the elderly, and larger than average effects for outgroups based on sexuality and physical disability. Here we will test the type of outgroup in generalization effects as possible moderator and as employed by the included impression formation experiments.

Tests of this design parameter will encapsulate variations in stereotype strength and in the affective and cognitive basis of prejudice: It is reasonable, for instance, that racial, gender, and age stereotypes are more strongly held and thus are less amenable to change, compared to occupational or student group stereotypes, because they are chronically activated (Brewer & Lui, 1989; Stangor & Ruble, 1989), infused by emotions (vs. cognitions; Stangor, Sullivan, & Ford, 1991), and because of instigating polarized responses due to relatively impermeable group boundaries (Bettencourt, Charlton, Dorr, & Hume, 2001). Stereotype strength and its close correlates affect several aspects of information processing, including attention to schema-relevant information (e.g., Allen, Sherman, Conrey, & Stroessner, 2009), schema activation and behavioral assimilation (e.g., Dijksterhuis, Aarts, Bargh, & van Knippenberg, 2000). Its reach extends to individual-to-group generalization (e.g., Hewstone & Hamberger, 2000; Kunda & Oleson, 1997; Maurer, Park, & Rothbart, 1995), most often by affecting the perceived goodness of fit of the target outgroup member. Hence, testing type of outgroup allows us to gauge the moderating role of stereotype strength, affective-cognitive basis of prejudice, and boundaries' permeability.

Considerations of outgroup type against participants' own social status also affords investigations of outgroup status. Some evidence in the intergroup contact literature suggests

that generalizations following face-to-face contact are larger for majority than minority group members (Tropp, 2006; Tropp & Pettigrew, 2005a); we will ascertain whether these majority-minority asymmetries extend to situations in which experiences with outgroup members are *not* face-to-face as in standard impression formation experiments.

Type of dependent variable. Impression formation experiments assess generalizations using measures borrowed from group perception and stereotyping research. These measures are of three main types: measures of stereotypicality or central tendency, measures of dispersion or perceived group variability, and measures of outgroup prejudice (Paolini et al., 2004). Measures of stereotypicality, or central tendency, require participants to indicate the extent to which a set of group-relevant attributes or traits apply to typical members of the target outgroup or to the outgroup as a whole, using trait rating tasks (e.g., Weber & Crocker, 1983, Study 1) or percentage estimates (e.g., Nisbett, Krantz, Jepson, & Kunda, 1983,, Study 1; Wyer, Sadler, & Judd, 2002, Study 1). Measures of group dispersion or variability assess the extent to which participants see group members as being spread and heterogeneous (vs. concentrated and homogeneous) around their group central tendency (Correll, Judd, Park, & Wittenbrink, 2010; Park & Judd, 1990). These measures consist of global similarity ratings or range ratings on a set of group-relevant traits (for an overview, see Park & Judd, 1990; see also, Maurer et al., 1995). Finally, measures of outgroup prejudice capture participants' overall evaluative appraisals of the outgroup as likeable-unlikeable, positive-negative. Examples of these measures are feeling thermometers (e.g., Brauer, Judd, & Jacquelin, 2001) and social distance scales (e.g., Desforges, Lord, Pugh, Sia, Scarberry, & Ratcliff, 1997).

Individual-to-group generalizations following (affect-laden) face-to-face contact have been found to be larger along affective, than cognitive indicators (Tropp & Pettigrew, 2005b; see also Pettigrew and Tropp, 2006). Our ancillary analyses will allow us to check whether

cognitive measures (i.e., stereotypicality and dispersion), rather than affective ones (i.e., prejudice) produce larger generalizations within the more cognitive-laden impression formation paradigms. The studies synthetized here might naturally emphasize cognitive processes due to participants' instructions to focus on information processing (e.g., "please attend to this information and try to form an impression of each of these individuals"). Our ancillary analyses will check if type of dependent variable and its affective vs. cognitive basis make a difference.

Type of control group and time lapse. Impression formation experiments use a range of control groups against which to assess the size of the generalization effects and vary also in the time introduced between the phase in which participants experience the individual outgroup members and the phase in which they express their group judgements. With regards to the control group, some studies benchmark their effects against a no-experience (dependent variables only) control group; others use a condition that is stereotype confirming, and a proportion uses a baseline control in a (pre-/post experience) repeated measure design where participants judge the group as a whole twice. With regards to time lapse, some studies have outgroup judgements following immediately or with minimal delay the information about individual group members; others introduce a sharper discontinuity between the two phases, for example, through a cover story that they belong to allegedly separate investigations; some implement a larger temporal gap with participants asked to return to the laboratory to complete the group judgments at a later date (i.e., delayed).

These two design parameters are relevant to test a demand characteristics explanation of generalization effects in impression formation experiments: The idea that in these studies, participants are 'encouraged' (or 'demanded') to engage in individual-to-group generalization by the contiguity of information about individual group members and the group judgments, cuing participants about this information's relevance for the judgments at stake (see McIntyre

et al., 2017 for an extensive discussion). From this stance, studies that used a repeated measure or baseline control group and studies that had no time lapse between the impression formation and the group judgment phases should have a generalization advantage over studies that used other control groups or protocols with a larger time lapse. We will test this possibility in our ancillary analyses.

Place of research. Testing the role of place of the research can shed light on the cross-cultural invariance of the generalization effects. Given the laboratory-based nature of the research included in this synthesis, however, we expected most of the participating studies to draw from more resourceful WEIRD samples (i.e., samples from Westernized, Educated, Industrialized, Rich and Democratic countries; Henrich, Heine, & Norenzayan, 2010). Therefore, we examined generalization effects as a function of studies' geographical location. This variable added to the list of design parameters we considered—type of experience, type of outgroup, affective-cognitive basis of outgroup, outgroup status, type of dependent variable, affective-cognitive outcome, type of control, time lapse, and place of research.

To summarize, our meta-analysis of past experimental laboratory-based research of individual-to-group generalization offers an unprecedented opportunity to test intergroup valence asymmetries and contrast theoretically distinguishable motivational explanations with experimental data that are unequivocal with regards to direction of causality, magnitude and direction of change, and self-selection biases. By synthetizing data across many individual tests, participants, and settings, as sufficiently broad and rigorous meta-analyses do, our synthesis strived to control for confounding variables that potentially afflict any individual test of intergroup valence asymmetry; in addition, we formally tested for moderation and the implication in valence asymmetries of several additional design parameters. In so doing, this meta-analytical synthesis, with its focus on the valence of the

outgroup experience and of the outgroup, gives us the strongest basis to date to establish both *whether* bad is invariably stronger than good in intergroup relations and *why*.

Method

Participating Experiments

The full set of experiments and coded variables relevant to this meta-analysis are reported in Table 3. Forty-seven published and unpublished impression formation experiments (59 individual tests; $N = 3{,}012$) were located and included in the meta-analysis as relevant to tests of intergroup valence asymmetry (for inclusion criteria, see below). The start search date was set to 1980 because a comprehensive narrative review of impression formation studies (Paolini, 2001), spanning between 1887 and 2000 indicated Hamill, Wilson, and Nisbett (1980) as the first suitable impression formation experiment for inclusion; the end search date was December 2016. Published articles appeared in a range of social psychological journals between 1980 and 2016; the pool of participating experiments included articles under review (e.g., Andrews, Yogeeswaran, Walker & Hewstone, under review), as well as unpublished conference presentations (e.g., Weisz & Oleson, 2001; Weisz, Oleson, & Cook, 2003). The experiments over-represented English-speaking and individualistic societies (e.g., USA, UK, see 'country' in Table 3)[5]; 18.6% of the total tests (11 tests) were from non-English speaking countries. The tests spanned across a variety of intergroup settings (e.g., ethnicity, sexual orientation, occupations, mental health groups; see 'outgroup stereotype' in Table 3).

Insert Table 3 about here

Procedure to Locate, Code, and Analyze Experiments

The experiments listed in Table 3 are a subset of a larger set of 70 individual tests from 53 individual experiments that were located in Psycinfo, Dissertation Abstracts, ERIC, Social Science Journals, and Google Scholar. The search used 13 keywords and composite terms, such as stereotype change, impression formation, individual-to-group[6]; in addition, we searched the names of prominent authors in the area (M. Hewstone, C. Judd, Z. Kunda, and B. Park). Relevant publications were identified also through reference lists of located articles and publication pages of the scholars listed as authors in the located studies or cited in the generalization literature. Unpublished experiments were sought making direct contact with identified generalization researchers and through distribution lists of eight leading professional societies (Asian Association of Social Psychology, British Psychological Society: Social Psychology Section, European Association of Social Psychology, Social Psychology Network, Society for Personality and Social Psychology, Society of Australasian Social Psychologists, Society of Experimental Social Psychology; Society for the Psychological Study of Social Issues).

Each experiment's test was independently coded by the second author and by one of two female psychology research assistants. The coders were trained following the principles outlined by Lipsey and Wilson (2001, pp. 88-90). This process started with training in the use and understanding of the coding protocol. Next, both research assistants coded a small set of studies and the results were compared and discussed to resolve any inconsistency. The second author coded all papers; each research assistant independently coded half of the papers. Agreement between the two coders for each item was checked and discrepancies resolved through discussion.

To keep a strict control over experience valence, tests were included in the analyses if the novel experience with individual outgroup members was provided to participants in a

written format (on paper or computer), or via video/audio stimulus (see 'Etype' in Table 3)[7]. The most common type of experience was deployed in a written modality (n = 44), followed by visual (n = 9), and audio (n = 6); in our ancillary analyses we tested for the moderating role of type of experience. Tests were included if, after providing information about individual outgroup members, they included and reported results for evaluations of the outgroup as a whole (i.e., outgroup stereotypicality, dispersion, and/or prejudice; see 'DV' in Table 3 and more details below; see Paolini et al., 2004; Wittenbrink et al., 1997 for discussions of outcomes' operationalizations in this tradition). In most cases, only one test was derived from a single experiment; any one experiment could however potentially yield three different tests—one test for each of the coded types of dependent variables (e.g., in Paolini et al., 2004, each participant completed measures of stereotypicality, variability and prejudice). To avert bias and inflation of the effect estimate, we only allowed each experiment to contribute once to the overall effect (Kulik, 1983; Wolf, 1986). For the five experiments that included multiple outcome measures, we included the test that formed the focus of the paper.

In order to quantify magnitude and direction of individual-to-group generalization effects, we focused on tests that used a control condition. Control conditions were coded as either a no-experience control group (see 'NEC' under 'control' in Table 3) that completed dependent measures only, a stereotype confirming condition ('CC') in between-subjects designs, or a pre-post outgroup experience baseline ('BSL') in within-subjects designs (Lipsey & Wilson, 2001; see 'control' in Table 3). Type of control was entered in our ancillary analyses to assess for any effects of design type.

The direction of the generalized changes in outgroup evaluations as a function of the novel experience with the outgroup members was also recorded, so that a positive effect

indicated a change in outgroup evaluations in the direction of the novel experience with outgroup members (i.e., an assimilation effect) and a negative effect indicated a change in an opposite direction (i.e., a contrast effect).

Focal design factors. Tests of valence asymmetry in this research relied on two factors: Experience valence and outgroup valence (see 'Eval' and 'Oval' in Table 3). Experience valence was defined in the coding protocol in terms of the evaluative direction (positive, negative, unclassified) of the information about the specific outgroup member(s) that had been provided to the participants. Reflecting a focus on bias reduction, there were more tests providing a positive (n = 42) than a negative experience of the outgroup members (n = 12); three tests provided outgroup experiences of ambiguous valence (see 'U' entries for unclassified/neutral in Table 3) and thus were excluded from analyses of exemplar valence. The overall inter-rater agreement for this design factor was 76%; that is 24% of the items coded were discrepant between the coders and resolved through discussion (for inter-rater agreement percentages, see Lipsey & Wilson, 2001; see also Bettencourt et al., 2001; McHugh, 2012). Outgroup valence was defined in the coding protocol in terms of the evaluative direction (positive, negative, unclassified) of the outgroup stereotype (see 'outgroup stereotype' in Table 3); reflecting a focus on reduction of stigmatization, there were fewer tests including a positive outgroup (n = 18) than a negative outgroup (n = 39). Tests with neutral, mixed or insufficient valence information about the outgroup were excluded (n = 13) as not relevant to an assessment of intergroup valence asymmetry (see Figure 1). The overall inter-rater agreement for this design factor was 95% (5% disagreement between coders resolved through discussion).

Additional design parameters. Several additional variables were coded to assess for their moderating effects and check their implication in focal valence asymmetries.

Type of experience with the outgroup member(s) was coded as visual, audio, or written (see 'Etype' in Table 3 and details above). Based on Harwood (2010) and Paolini et al. (2007), we treated visual experiences as being richest, most self-involving, and affective based; we treated written experiences as being least rich, least self-involving, and more cognitive based; audio was regarded as falling between these two poles.

The outgroup stereotype under investigation was used as a basis to code for type of outgroup, affective-cognitive outgroup basis, and outgroup status. Type of outgroup was coded as either ethnic/national (e.g., Russians or Asian Americans), ageing or disability, student groups (e.g., course majors or fraternity groups), occupations (e.g., accountants), or other (i.e., groups for which the number of tests were insufficient to form a stand-alone level for this parameter; e.g., lesbians, people with obesity). To test for variations in the affective-cognitive basis of outgroup prejudice, we also included a dichotomized coding for cognitive-based outgroups versus affective-based outgroups (see 'Obasis' in Table 3); this coding was modelled on Paolini et al. (2007): We first identified all the outgroups investigated in our set of studies and used a pilot test and raters' judgments to code each outgroup as either cognitive or affective in nature. Participants in the Pilot Study were six individuals (2 males, 4 females) from a metropolitan area in Australia and a mean age of 26.67 years (2.33 *SD*). Participants were approached in a public shopping centre and asked to complete a 5-minute anonymous survey. They were asked to read a list of 24 out-groups and rank them from 1 to 24, assigning highest ranks (e.g., first, second, etc.) to the "groups most associated with [their] emotions and feelings" (i.e., affective-based groups) and assigning lowest ranks to the groups that were "most associated with [their] thoughts and beliefs" (i.e., cognitive-based groups; measures taken from Paolini et al., 2007). The individual ranks were averaged across Pilot Study participants to create a mean ranking. The bottom-ranked 13 (cognitive-based) outgroups were occupations and student groups; these included: accountants, child care

workers, cleaners, doctors, education students, physics students, politicians, psychology students and teachers. The top-ranked 11 (emotion-based) outgroups, were all socially charged and stigmatized groups; these included: Black people, people with a disability, elderly people, females, homeless people, homosexuals, immigrants, males, mentally ill people and religious groups. In the coding protocol for our ancillary analyses, outgroup basis was therefore coded by categorising each outgroup under investigation as being either an affective-based group (e.g., racial/ ethnicity, gender, disability, age) or a cognitive-based group (e.g., occupation/student groups). Considerations of outgroup type against participants' own social status afforded investigations of outgroup status. This variable was coded to indicate whether the outgroup was 'lower status', 'higher status' or 'similar in status' to the participants' in-group (see 'status' in Table 3). For example, Ramasubramanian (2015) focused on African Americans as the outgroup for a participating sample of predominately White (75%) undergraduate students; hence, their outgroup was coded as 'lower status'. Most times it was clear if the outgroup was lower, higher, or similar in status in the research social setting. However, in a minority of cases there were some cultural and temporal barriers to assessing status with some confidence, hence outgroup status could not be ascertained (n = 10). These tests were therefore coded as unclassified along this variable.

Information about the group judgments included in the impression formation experiments contributed to the coding for type of dependent variable and affective-cognitive dependent variables. Type of dependent variable was coded along three levels: stereotypicality, dispersion, and prejudice (see 'DV' in Table 3), to reflect most common operationalizations of group perceptions in the social cognitive tradition (Paolini et al., 2004; Wittenbrink et al., 1997). Generalization experiments were coded as measuring outgroup stereotypicality when they assessed the perceived central tendency of the outgroup distribution on a particular trait or set of traits (see Lippmann, 1932; see e.g., Ashmore & Del

Boca, 1981; Guinote, 2001). They were coded as measuring outgroup dispersion when the group judgments assessed the extent to which participants saw the outgroup group members as being dispersed (vs. concentrated) around their central tendency (see Correll et al., 2010; Park & Judd, 1990). The third type of outgroup judgments we coded for captured the affective and attitudinal value (positive vs. negative) that social perceivers ascribed to the outgroup in general; prejudice has been measured in a variety of ways (Correll et al., 2010), including rating the outgroup on a feeling thermometer (e.g., Brauer et al., 2001), endorsing valenced judgments and beliefs about the group (Bodenhausen et al., 1995; Hamill et al., 1980), or expressing desired social distance from outgroup members at various degrees of interpersonal closeness (Desforges et al., 1997). Despite these visible differences in operationalization, all these measures assess how favorably or unfavorably the participants viewed the outgroup. To ascertain whether the affective vs. cognitive nature of the outgroup measure makes a difference to the generalizations in impression formation experiments (cf. Paolini et al., 2007; Tropp & Pettigrew, 2005b for tests in the contact literature), type of dependent variable was further dichotomized between 'cognitive' and 'affective' dependent variables—measures of outgroup stereotypicality and dispersion were coded as cognitive in nature and measures of outgroup prejudice were coded as an affective in nature.

Type of control was coded to distinguish between experiments that benchmarked their generalization effects against a no-experience/dependent only condition, a stereotype confirming condition, or a pre-post experience baseline measurement (see earlier; see 'NEC', 'CC' and 'BSL' entries in Table 3's 'control'). The time lapse between the experience with the outgroup member(s) and the assessment of the group dependent variables was also coded (see 'time' in Table 3). We coded experiments as 'immediate', when the dependent variables were taken immediately, or very shortly, after the novel outgroup experience; as 'minor delay/separate study' when the dependent variables were taken with some delay after the

outgroup experience, or using the guise of a second/different study. Experiments were coded as 'delayed' when the participants left the testing room after their experience of outgroup members and returned a later time for the assessment of the dependent variables. Place of research where data collection was carried out was coded as USA, UK, Australia/New Zealand, other-Europe (see Table 3's 'country'); this variable afforded tests of geographical variations in generalization effects.

Key computations. Comprehensive Meta-Analysis (CMA, version 3.0; Borenstein, Hedges, Higgins, and Rothstein, 2011) was used for our meta-analytical analyses. Effect sizes in tables are expressed in terms of Hedges and Olkin's (1985) *g* and associated *r* (Borenstein, Hedges, Higgins, & Rothstein, 2009). We chose this measure of effect sizes because the population standard deviation is often unknown in impression formation research and Hedges' *g* corrects for bias associated with estimating this population parameter using a gamma function. As Hedges' *g* is scale-free (Timm, 2004), in our reporting in tables and Figure 2 we included reference to Hedges and Olkin's *r*s, which range between -1 and +1, for ease of interpretation. Hedges' *g* is calculated in CMA using the effect size calculator developed by Wilson and is equivalent to Cohen's *d.* Each effect size was estimated from relevant condition means, *t*-test for independent or paired samples, *F* statistics for main effects, or *F* statistics for interactions accompanied by means and sample sizes. For within-subject studies, the recommended approach is for effect size estimates to account for the correlation between paired observations (Borenstein et al., 2009). There were five experiments (11 tests) using a within-subjects design; however, none of these experiments provided the correlation data for the paired values. Hence, we treated data from within-subject experiments in the same way as data from between-subjects experiments. Wherever the reported data included the standard deviations for the two target conditions (i.e., the control and the experimental conditions) or the two measurements (i.e., the baseline and post-

treatment measurement), the pooled standard deviation was computed based on these results; when standard deviations were not reported, an estimate of the pooled standard deviation was obtained from analysis of variance results (Lipsey & Wilson, 2001). There were four tests that reported no significant differences between control and experimental conditions (i.e. absence of generalization), and failed to supply any further statistics (e.g., Kunda & Oleson, 1997; Wallace, 2008). These were conservatively set to an effect size of zero (Wolf, 1986; see also Bettencourt et al., 2001). When the exact number of participants allocated to each condition was not specified, an estimate was computed by dividing the number of participants between conditions. Inter-rater agreement for the calculation of the *g* value was 94% with discrepancies resolved through discussion.

A random effects analysis approach was used for our analyses; this approach is desirable when analyzing a number of different tests from variable sources because it makes the assumption that there are two sources of variability: one due to the sampling of people into studies and one due to differences in effect sizes from unidentifiable, random, sources (e.g., Hedges & Olkin, 1985; Lipsey & Wilson, 2001; for a review, see Normand, 1995). We used a mixed-effects analysis for the moderation analyses. In the reporting of our main analyses, we included also two publication bias indicators. Classic fail-safe *N* indicates the number of null tests that would be required to nullify an obtained effect. We also included adjusted effect size estimates using Duval and Tweedie's trim and fill technique. This trim and fill procedure re-computes *g*s by 'trimming' the bias associated with studies of small sample size while 'filling' missing studies (Borenstein, 2005; Borenstein et al., 2009); this procedure ascertains whether the impact of publication bias is trivial, modest or substantial in terms of slim (vs. large) differences between original and adjusted *g*s (Higgins & Green, 2011). This approach afforded us a stringent test of valence asymmetries in negative and positive intergroup settings.

Results

Overview of Analyses

Our reporting is organized in three sections. In the first section, we meta-analytically analyze our experiments along the ancillary design parameters to ascertain whether these factors moderate the magnitude of individual-to-group generalizations as detected in impression formation experiments (see McIntyre et al., 2017). In the second section, we report our main tests for intergroup valence asymmetries by meta-analytically analyzing the experiments for the moderating effects of the two focal design factors – outgroup valence and experience valence. In the third section, we check whether the design factors co-vary with the additional design parameters and repeat our key meta-analytical tests of valence asymmetry controlling for these additional design parameters.

Checking Moderation by Additional Design Parameters

Moderation analyses along the ancillary design parameters were carried out to ascertain whether parameters of theoretical interest but of no direct relevance to valence asymmetries systematically affected the magnitude of individuals-to-group generalizations. We reasoned that we would enter our main tests of valence asymmetry with greater confidence had we shown that our pool of experiments and effects are unaffected by the additional design parameters.

Across the 54 experiments that entered our test of the focal interaction between outgroup valence and experience valence, we detected a small-to-medium (Cohen, 1992) positive individual-to-group generalization effect ($r = .28$, $g = .57$, $p < .001$) indicative of participants reporting significant changes in outgroup evaluations in the direction of the novel experience with the outgroup member(s) (i.e., an assimilation effect). This effect was characterized by a significant heterogeneity of effects, $Q\,(53) = 139.51$, $p < .001$, pointing to

the influence of moderating variables. Hence, next we meta-analytically tested whether this overall generalization effect was moderated by each of the additional design parameters—we found no evidence of moderation. The results of these analyses are summarized in Table 5.

Insert Table 5 about here

Type of experience did not moderate the magnitude of individual-to-group generalizations: While each and all experience modalities produced significant generalization effects (*r*s between .20-.37, *g*s between .42-.79, all *ps* < .017), these generalization effects did not differ in magnitude as a function of whether the experience with the outgroup members was visual, audio, or written in nature; Q (3) = 3.63, p = .305. Hence, experience richness, its affective-cognitive basis, or the degree of self-involvement in the outgroup experience did not affect the extent to which experience with individual outgroup members affected outgroup judgments in impression formation experiments.

Type of outgroup did not moderate the generalization effects when the analyses focused on most frequently investigated types of outgroup in this research tradition, Q (3) ≤ 1; there were no statistical differences in generalization between ethnic/national, ageing/disability, student and occupation groups (*r*s between .19-.27, *g*s between .39-.55, all *ps* < .052). The inclusion of the unclassified experiments (n = 13), which had visibly larger effects (r = .39, g = .85, p < .001; see e.g., Corley & Pollack, 1996; Hamill et al., 1980; Pedersen et al. 2011; Swift et al., 2013), as part of the 'other' category, made the moderation effect marginally significant (Q (4) = 8.93, p = .063). Hence this diverse set of experiments investigating a range of outgroups (e.g., lesbians, welfare recipients, asylum seekers, obese people) included at least some with large generalizations. When looking at variations in type of outgroup as a function of whether they were *affective based or cognitive based* (see results

for 'basis of outgroup' in Table 5), again we found no reliable difference in generalization, Q (1) < 1: Affective-based groups (e.g., racial groups, people with disabilities, the elderly, etc.) returned generalization effects of similar magnitude (r = .28, g = .59, p < .001) to cognitive-based groups (e.g., occupational and student groups; r = .27, g = .56, p < .001). Hence, unlike in intergroup contact studies (Paolini et al., 2007; Tropp & Tropp, 2005b), in impression formation experiments, the affective-cognitive basis of prejudice made no appreciable difference. A similar pattern was found for *outgroup status*: Generalization effects were significant with outgroup of varied status (rs between .25-.32; gs between .52-.69, all ps < .01), but unlike in intergroup contact research (Tropp, 2006; Tropp & Pettigrew, 2005a), status did not make a significant difference to their magnitude in impression formation experiments; Q (3) = 1.05, p = .790.

We detected no significant difference in generalization as a function of *types of dependent variable*, Q (2) ≤ 1); hence it did not matter whether generalization was measured in terms of stereotypicality or central tendency, dispersion or group variability, or prejudice (rs = .25/28, gs = .52/.58, ps ≤ .001). This pattern was unchanged when type of dependent variable was recoded as cognitive (i.e., stereotypicality *and* dispersion) or affective (e.g., prejudice; see 'affective-cognitive DV' in Table 5): The affective-cognitive basis of the dependent variables used to index generalization does not impact on effect sizes (Q (1) < 1) in these paradigms (cf. Tropp & Pettigrew, 2005b, contact research).

Types of control did not moderate the generalization effects, Q (2) ≤ 1; hence, generalization was invariant, irrespective of whether these effects were benchmarked against a no experience/dependent only control, a stereotype confirming control, or a baseline within-subjects control (rs = .23/29, gs = .48/.60, ps < .001). *Time lapse* between the novel experience with the outgroup members and dependent variables also seemed not to matter, Q

(2) = 2.89, p = .235. There were no differences between experiments that assessed group evaluations immediately after the novel outgroup experience, that introduced a slight delay, used the guise of a separate study, or delayed assessment of the dependent measures (rs = .15/.29, gs = .31/.62, ps ≤ .061). These null effects for control and time lapse challenge the interpretation that generalization effects in impression formation experiments are due to demand characteristics (McIntyre et al., 2017 for similar data and a broader discussion).

A null moderating effect was found also for *place of research*, Q (3) ≤ 1. As we suspected, the participating experiments were all from WEIRD samples (Henrich et al., 2010) from resourceful, individualistic OCD nations. There was no appreciable difference in size of generalization as a function of geographical variation between the USA, UK, Australia/New Zealand, and the rest of Europe (rs between .25-.40, gs between .52-.88, all ps < .066).

Overall, we found no evidence that the ancillary design parameters affected the magnitude of individual-to-group generalizations in impression formation experiments. These null findings provide a comfortable springboard for the key tests of intergroup valence asymmetries, which we report in the next section.

Testing for Intergroup Valence Asymmetries

For our focal tests of valence asymmetries, we meta-analytically analyzed the included experiments for the moderating effects of outgroup valence and experience valence – and for their interaction. We entered in the model the main effects (design factors' codes, *positive* = 0, *negative* = 1) and in a second step added the interaction term (as their multiplicative term). All these key results are reported in Table 6a; we comment on the results for the main effects first and then turn to the interaction and simple effects.

Insert Table 6a about here

Looking at the main effect of outgroup valence, we found evidence of significant generalized changes in evaluations of negative, stigmatized outgroups (r = .27, g = .54, p < .001), as well as in evaluations of positive, admired outgroups (r = .31, g = .65, p < .001). The fail-safe N for negative outgroups was 1,115 and for positive outgroups was 322. Duval and Tweedie's trim and fill procedure returned a small-to-medium effect size (see Cohen, 1992) for both negative and positive outgroups (adjusted gs of .40 and .43, respectively). The difference in effect size between negative and positive outgroups was not significant, Q < 1; hence, participants were equally willing to revise their positive and their negative views of outgroups in light of novel experiences with individual outgroup members.

Turning to the main effect of experience valence, we found evidence of significant generalized changes in outgroup evaluations in the direction of the novel outgroup experience after negative experiences with outgroup members (r = .28, g = .59, p < .001), as well as after positive experiences with outgroup members (r = .28, g = .56, p < .001). The fail-safe N for negative experience was 141 and for positive experience was 1,560. Duval and Tweedie's trim and fill procedure returned adjusted gs of .43 and .41, respectively. Critically, against predictions of a *general* advantage of negative experiences, as derived by both risk aversion and ingroup enhancement explanations, the difference between negative and positive experiences was not statistically significant, Q < 1; hence, we did *not* observe a *general* tendency to revise outgroup evaluations more after a negative experience with outgroup members than after a positive experience with outgroup members[8].

Next, we considered the moderating effects of outgroup valence *and* experience valence *simultaneously* in order to: (1) provide a meta-analytical replication with experimental data of negative valence asymmetries in evaluations of negative, stigmatized outgroups (cf. correlational studies in Table 1); (2) contrast explanations based on risk

aversion vs. epistemic defense/ingroup enhancement under positive outgroup domains (see Figure 1's right-hand sides), and (3) contrast epistemic defense vs. ingroup enhancement explanations for symmetrical vs. asymmetrical evaluative fit effects. The key results for these analyses are also in Table 6a and are displayed in Figure 2.

Insert Figure 2 about here

As discussed earlier, the theoretical accounts under consideration converge in their predictions for negative valence asymmetries in negative, stigmatized outgroup domains (cf. left-hand sides of Figure 1). We found meta-analytical, experimental evidence consistent with these predictions: Negative experiences with individual members of negative, stigmatized outgroups produced significantly larger generalized changes in outgroup evaluations (r = .48, g = 1.08, p < .001) than positive experiences with individual members from these negative outgroups (r = .25, g = .49, p < .001), Q (1) = 5.72, p = .017; this effect is a medium-to-large effect (r = .28, g = .60, p = .017; Cohen, 1992). These meta-analytical results for a negative valence asymmetry for negative, stigmatized outgroups replicate past correlational evidence from direct intergroup contact tests (e.g., Barlow et al., 2012; Graf et al., 2014; see Table 1's studies with 'NA' entries under 'asymmetry') and further corroborate key predictions from Paolini et al.'s (2010) model of valence asymmetry in individual-to-group generalization. Critically, they do so in a more stringent and conclusive way: By synthetizing *experimental* research, this novel evidence is uncontroversial regarding direction of causality—i.e., it reflects effects that go from the valence of the novel experiences with outgroup members to outgroup evaluations—and it rules out self-selection biases that most likely afflict past correlational tests in the field (see Table 1). Moreover, by being *meta-analytical*, this novel evidence rules out a host of confounds potentially troubling individual tests of intergroup

valence asymmetry and therefore gives us greater confidence that negative valence asymmetries are modal effects in people's reactions to stigmatized outgroups.

Yet, because all theoretical accounts of interest converge in their predictions for negative/outgroups, even this more stringent, meta-analytical evidence cannot logically shed light on the exact driver responsible for intergroup valence asymmetries. For competing tests of the risk aversion explanation against the epistemic defense/ingroup enhancement explanations, we had to turn to the results for the outgroup valence by experience valence interaction and check whether we detected an ordinal or a dis-ordinal interaction. We found evidence for a significant and large dis-ordinal interaction (r = .50, g = 1.01, z = 2.82, p = .005; Cohen, 1992) that is consistent with epistemic defense and ingroup enhancement explanations, and is inconsistent with risk aversion explanations (see Figure 2).

Individual-to-group generalization presented in each and every level of the 2 outgroup valence x 2 experience valence design (rs between .21-.48; gs between .43 and 1.08; all ps ≤ .018; see Table 6a). Contrary to risk aversion explanations, however, the pattern of effects was in the direction of a positive valence asymmetry for positive, admired outgroups – we found a statistical trend of small-to-medium size for positive outgroup-positive experience experiments to display a generalization advantage over the positive outgroup-negative experience experiments (r = .42, g = .88, p < .001 vs. r = .21, g = .43, p = .018); effect for the difference, r = -.23, g = -.45, Q (1) = 2.86, z = -1.69, p = .091; and to be substantially unaffected by publication biases (see Table 6a). The positive valence asymmetry for positive, admired outgroups did *not* reach conventional levels of significance, most likely due to the limited power (9 *vs.* 9 experiments; cf. Harwood et al., 2015). Later we investigate the role in this difference of methodological covariates.

A close-up look at this dis-ordinal interaction revealed spread out evidence of evaluative fit effects consistent with epistemic defense and ingroup enhancement explanations and inconsistent with risk aversion explanations. Generalized changes in outgroup evaluations were marginally larger among negative outgroup-negative experience experiments, than among positive outgroup-negative experience experiments ($Q = 3.47$, $p = .062$, $r = .31$, $g = .65$, $p = .062$). Generalized changes were significantly larger among positive outgroup-positive experience experiments, than among negative outgroup-positive experience experiments ($Q = 4.08$, $p = .043$; $r = -.19$, $g = -.36$, $p = .043$). These results confirm that negative valence asymmetries are *not* context invariant; rather, they reflect evaluative fit (or match) between the valence of novel experiences with outgroup members and the valence of pre-existing expectations about the outgroup in line with epistemic defense and ingroup enhancement explanations.

Competing tests of epistemic defense and ingroup enhancement explanations are notoriously difficult to achieve because they contrast accounts that are not mutually exclusive (see Footnote 2). Empirically, they rely on fine-grained tests capturing slightly differently shaped dis-ordinal interactions between outgroup valence and experience valence (i.e., symmetrically shaped interaction for epistemic defense explanations vs. asymmetrical interaction for ingroup enhancement explanations; cf. right vs. left-hand sides of graphs b. and c. in Figure 1). Our key meta-analytical results, as displayed in Figure 2, had some obvious properties of symmetry: Statistically, we found no reliable difference in the size of the generalization effects detected between the negative outgroup-negative experience experiments and the positive outgroup-positive experience experiments (the two taller bars in Figure 2), $Q < 1$, $p = .586$. Similarly, we found no reliable difference between the negative outgroup-positive experience experiments and the positive outgroup-negative experience experiments (the two shorter bars), $Q < 1$, $p = .785$. Critically, the difference in absolute

terms between the two effect sizes for the negative outgroups (.28; $Q = 5.72$, $p = .017$) was not statistically different from the difference between the two effect sizes for the positive outgroups (-.23; $Q = 2.86$, $p = .091$); $z = .17$, $p = .879$ (for methods, Lowry, 2016; Rosenthal, 1991; see e.g., Fejafar, 2000). Hence, the pattern of generalizations we detected was symmetrical in nature: Overall, the magnitude of negative valence asymmetries in individual-to-group generalization we identified for negative, stigmatized outgroups was comparable in size to the magnitude of positive valence asymmetries in individual-to-group generalization we identified for positive, admired outgroups. Therefore, in responding to novel experiences with outgroup members, participants of impression formation experiments displayed generalizations consistent with an *equal* motivation to maintain *positive and negative* views of outgroups; contrary to an ingroup enhancement account, they displayed *no* proclivity to *selectively* protect (or strive for) *negative* views of outgroups at the expense of positive views of outgroups. Notwithstanding the technical challenge of carrying out these fine-grained comparisons, the results of these tests of symmetry (together with the null finding for an overall negative valence asymmetry or main effect of experience valence) are inconsistent with the proposition that ingroup enhancement colors evaluative fit effects *over and beyond* the impact of epistemic defense.

Controlling for Additional Design Parameters

In this third set of analyses, we refined our approach to the focal tests of valence asymmetry to account for variations in the additional design parameters. We first checked whether the focal design factors co-varied with the additional design parameters and then repeated the key meta-analytical tests of the interaction and simple effects controlling for the design parameters. We used Pearson χ^2 with exact p value for our tests of covariation with categorical variables and found only sparse and weak evidence of covariation between our focal IVs and the additional parameters. Results for these analyses are in Table 7a for tests

involving outgroup valence, in Table 7b for tests involving experience valence.

Insert Tables 7a and 7b about here

There was some evidence of covariation between outgroup valence and type of outgroup ($\chi^2(4) = 8.82$, $p = .063$), affective-cognitive basis of outgroup prejudice ($\chi^2(2) = 8.24$, $p = .017$), and outgroup status ($\chi^2(3) = 17.46$, $p < .001$); all other χ^2 indices were not significant, all *p*s > .16. These effects reflected the fact that outgroup negativity in impression formation experiments was disproportionately operationalized in terms of ethnic and national groups, aging and disability groups (as well as groups from the category 'other'); outgroup negativity reflected groups experienced as affectively (vs. cognitively) based; they were groups of lower or equal social status to the participants' ingroup. There was also some evidence of covariation, again at times weak, between experience valence and type of outgroup, ($\chi^2(4) = 8.19$, $p = .082$); type of DV ($\chi^2(2) = 8.21$, $p = .016$), affective-cognitive DVs ($\chi^2(1) = 4.88$, $p = .039$) and place of research ($\chi^2(2) = 5.16$, $p = .064$); all other *p*s > .13. These effects reflected the fact that experiments testing the effects of positive experiences with outgroup members (aka bias reduction experiments) focused on ethnicity, nationality aging, disability (and 'other') groups; they used affective indicators of generalization and included measures of outgroup prejudice and dispersion; these studies were more frequently carried out in the UK and other European countries than the other experiments.

As these analyses indicate that the impression formation experiments meeting our strict eligibility criteria to enter our meta-analytical tests of intergroup valence asymmetry were not always homogenously distributed across all levels of the additional design parameters, we repeated our key meta-analytical tests of valence asymmetry accounting for these parameters. The study sample's power prevented us from controlling simultaneously for

multiple parameters; hence, we re-ran our tests for main effects, interaction, and simple effects with each of the individual design parameters entered individually as covariates. Table 6b reports these refined results *with* covariates (see *g* and *p* values under design parameters' columns); it allows direct comparisons with our original results *without* covariates (see coefficients for *g* and *p* under 'covariate – none' section of the table).

Insert Table 6b about here

Our original results for the main effects of outgroup valence and experience valence were unchanged when controlling for the additional design parameters: The difference in generalization effects between negative and positive outgroups and between negative and positive experiences with outgroup members were (still) not significant when controlling for possible methodological confounds in the pool of eligible experiments (*g*s between -.04 and -.17, *g*s between -.01 and -.08, respectively, all *p*s > .30). These results confirm once again that the valence of the outgroups and the valence of the novel experience with outgroup members do *not* on their own moderate the magnitude of individual-to-group generalizations. Even when controlling for a variety of design parameters, participants in impression formation experiments were still equally open to revise their evaluations of negative, stigmatized outgroups and positive, admired outgroups. More importantly for our focus on valence asymmetry, participants were not displaying a general negative valence asymmetry either: Outgroup evaluations changed to the same extent after novel negative and novel positive experiences with outgroup members. These null findings for the main effect of experience valence are again inconsistent with explanations based on risk aversion and ingroup enhancement.

Importantly, the interaction between outgroup valence and experience valence

remained significant and very similar in size when controlling for the additional design parameters (*g*s ranging between .94 and 1.14, all *p*s < .010). This gives us greater confidence that outgroup valence and experience valence interact together to moderate the magnitude of individual-to-group generalizations and do so, even when controlling for variations in type of experience, type of outgroup, affective-cognitive outgroup basis, outgroup status, type of DV, affective-cognitive DV, type of control, time lapsed, and place of research. Critically, we checked whether accounting for parameters of theoretical and practical significance in the generalization literature consolidated or changed the conclusions drawn from the simple effects of experience valence for negative outgroups vs. positive outgroups.

Our original meta-analytical experimental finding for negative valence asymmetries with negative, stigmatized outgroups held significant when controlling for any of the additional design parameters (*g*s ranging between .60 and .70, all *p*s < .027). Hence, the negative outgroup-negative experience experiments produced reliably larger generalization effects than the negative outgroup-positive experience experiments—even when controlling for the additional methodological parameters. Therefore, consistent with the three theoretical accounts under consideration, negative experiences with members of negative, stigmatized outgroups *indeed* caused significantly more worsening of outgroup evaluations than positive experiences with individuals from these groups caused improvements of these groups' evaluations (see Paolini et al., 2010). We pointed out earlier that these negative valence asymmetries are unambiguous with regards to direction of causality and are unaffected by self-selection process; this last set of analyses now indicates that they are not the mere product of methodological confounds potentially afflicting individual tests or the entire set of impression formation experiments.

Next, we controlled for covariates while re-testing positive valence asymmetries among positive, admired outgroups. These tests are particularly important: Theoretically,

they can shed light on valence asymmetry's motivational underpinning. Empirically, by controlling for factors that inject noise in effect size estimates, these refined tests have the potential to sharpen the marginal effect we originally detected for positive, admired outgroups without covariates (r = -.23, g = -.45, z =-1.69, p = .091) into a fully significant positive valence asymmetry. In order to refine the comparison between positive outgroup-positive experience experiments and positive outgroup-negative experience experiments, we should *selectively* control for the additional design parameters that covaried with experience valence—i.e., type of outgroup, type of DV, affective-cognitive basis of the DV, and place of research—and disregard any other design parameter that did *not* covary with the focal IV in these tests (Berneth & Aguinis, 2016; Caliendro & Kopeining, 2008). When selectively controlling for these design parameters, we found that the positive valence asymmetry detected for positive, admired outgroups reached conventional levels of significance three times out of four; type of outgroup (r = -.34, g = -.73, p = .032), type of DV (r = -.52, g = -1.21, p = .007), and place of research (r = -.33, g = -.71, p = .050; vs. affective-cognitive basis of the DV, r = -.25, g = -.52, p = .111). Hence, controlling for the methodological parameters that displayed some degree of covariation with (aka confounded) operationalizations of experience valence in impression formation experiments unveiled significant positive valence asymmetries among positive, admired outgroups. These results increase our confidence that negative valence asymmetries are modal effects for negative, stigmatized outgroups and positive valence asymmetries are modal effects for positive, admired outgroups. These evaluative fit effects align with the pattern of individual-to-group generalizations expected by epistemic defense and ingroup enhancement explanations; they are inconsistent with the pattern expected by risk aversion explanations.

Discussion

This research aimed to establish whether bad is invariably stronger than good in

intergroup relations and why. We started from the recognition that existing correlational field tests of valence asymmetry in outgroup evaluations (Table 1) return mixed findings and are silent about the motivational underpinnings of these effects. As limited research has investigated positive, admired outgroups, past research does not establish whether bad is typically stronger than good because negativity, more than positivity, (a) instigates the organism's overriding need to preserve its biological and psychological integrity against environmental threats (*risk aversion* explanations); (b) confirms pre-existing negative knowledge structures and expectations about outgroups that the individual is motivated to maintain (*epistemic defense* explanations); or (c) sustains negatively biased and partisan views of outgroups that meet the individual's need for ingroup's positive distinctiveness (*ingroup enhancement* explanations). After controlling for modest methodological confounds, we detected consistent positive evidence in favor of epistemic defense explanations for intergroup valence asymmetries, some support for ingroup enhancement and least support for risk aversion explanations. Specifically, against risk aversion and ingroup enhancement accounts, we detected no general negative valence asymmetry across outgroup domains. In favor of both epistemic defense and ingroup enhancement explanations, we found a significant dis-ordinal outgroup valence by experience valence interaction, which held also when controlling for additional design parameters, and reflected widespread evaluative fit. There was no compelling evidence that ingroup enhancement motives further modulate these effects; instead, ancillary tests of interaction's symmetry indicated *no* obvious *differences* in the absolute size of evaluative fit effects across positive and negative outgroup domains, consistent with epistemic defense and contrary to ingroup enhancement accounts.

Overall, these meta-analytical data demonstrate that bad is not invariably stronger than good in all intergroup relations — rather bad is stronger than good in negative, stigmatizing intergroup contexts and good is stronger than bad in positive, admired contexts.

Below we discuss broader implications of these results for intergroup theory and interventions, and identify research limitations and new foci for research.

Bad is Indeed Stronger than Good in Negative, Stigmatizing Intergroup Contexts

> —*One of the major tasks of future research in this area will be to designate those domains in which negativity bias and positivity bias are manifested. We want to leave the reader with the sense that there really is a negativity bias, a meaningful, and adaptive one, in much of human and animal cognition and behavior* (Rozin & Royzman, 2001, p. 317).

Our systematic investigation of intergroup valence asymmetries in individual-to-group generalization took on Rozin and Royzman's charge and arrived at similar conclusions: We endeavored to delineate the intergroup domains in which negativity biases and positivity biases present and, in the process, reaffirmed the robustness of negative intergroup valence asymmetries.

Consistent with what we learnt from over 60 years of intergroup contact research, our meta-analysis of experimental lab-based tests of generalization confirms that positive experiences with individual members of negative, stigmatized outgroups significantly improve evaluations of these groups. Our *r* of .25 for the negative outgroup-positive experience experiments falls nicely between Pettigrew and Tropp's (2006) *r* of .29 for intergroup contact studies meeting Allport's conditions for optimal positive contact, and their *r* of .20 for corrective contact interventions that do not meet all those conditions. Hence, exposing people to positive information about members of devaluated groups remains a viable intervention strategy to alleviate prejudice and negative stereotypes in society. Our meta-analytical synthesis however ventured in territories of bias *exacerbation* that are typically overlooked by prejudice reduction research (but still in the research radar of scholars concerned with fundamental social psychological processes). The findings from a

small number of negative outgroup-negative experience experiments demonstrate unsurprisingly that when people have negative experiences with members of stigmatized groups, responses to these groups are significantly worsened.

Critically, however consistent with predictions for a relative advantage of negative outgroup experiences (Paolini et al., 2010) and past correlational evidence of negative valence asymmetry (e.g., Barlow et al., 2012; Dhont & Van Hiel, 2009; see 'NA' entries in Table 1), we found that these negative experiences with members of stigmatized outgroups worsened outgroup evaluations *significantly more* than positive experiences improved them. The difference in generalization between negative outgroup-negative experience experiments and negative outgroup-positive experience experiments held robust and significant even when controlling for nine design parameters of interest in the generalization literature but of no immediate relevance in the literatures on valence asymmetry (i.e., type of experience, type of outgroup, basis of outgroup, outgroup status, type of DV, affective-cognitive DV, type of control, time lapse, and place of research).

As these findings stem from experimental laboratory-based tests, they are free from the interpretative ambiguity of reversed causation and self-selection biases (cf. correlational field research in Table 1) and lend themselves to an unequivocal, simple, and crystal-clear conclusion: *Bad is indeed stronger than good in stigmatizing contexts*. Responses to devalued groups in society are therefore disproportionately affected by the impact of negative experiences, so that a negative experience with members of these groups worsens group-level responses more than positive experiences with members of these groups improve them. Hence, in concrete terms, if Black Americans have a negative stereotype of White police officers – the media of the police shootings will significantly worsen their attitude but positive press faces an up-hill battle.

More research on the impact of negative experiences with outgroup members is

however needed (McKeown & Dixon, in press). Impression formation experiments that look at the impact of negative information about outgroup members are still a rare commodity; in this meta-analysis, they were three time less frequent (12 vs. 42) than the tests attempting to instigate a positive change. While it is essential to carefully manage the ethical implications of research of this kind, we do need more of these studies. Hence, for instance, we welcome experimental studies on the learning of intergroup anxiety and negative evaluations (e.g., Olsson, Ebert, Banaji, & Phelps, 2005; for reviews, Hofmann, De Houwer, Perugini, Baeyens, & Crombez, 2010; Paolini et al., 2016) and look forward to more field contact research on negative contact (e.g., Kusumastuti et al., 2017; Maoz, 2011), especially in settings that minimize self-selection (i.e., people's ability to opt out of intergroup contact like in schools and in the workplace; Bekhuis et al., 2013; Stark et al., 2013). These investigations will be well placed in ascertaining the generalizability of our findings to other paradigms that expose individuals to negative experiences with stigmatized outgroups.

Research on valence asymmetry in other areas of psychology has speculated but rarely provided direct evidence for the psychological underpinnings of these effects (Footnote 1 reviews a range of suggested mediators; Table 2 summarizes some of these literatures' intricacies). Our meta-analytical data did not allow a direct exploration of mediational processes. Yet, theoretical analyses and independent evidence suggest that negative valence asymmetries in *evaluations* of stigmatized outgroups might reflect undercurrent valence asymmetries in *social categorization* (Harwood et al., 2015; Paolini et al., 2010; Turnbull, Paolini, Griffin, Harris, & Neumann, 2017). As noted at the start, we know from extensive experimental and longitudinal research that negative experiences with outgroup members cause higher category salience than positive experiences (Gaertner et al., 1993; Gaertner & Dovidio, 2000; Greenland & Brown, 1999; Paolini et al., 2010, 2014). It is also well established that high category salience facilitates generalized changes in outgroup evaluations

(see Brown & Hewstone, 2015). This means that negative experiences with members of stigmatized groups might lead to more robust generalizations than positive experiences *because* negative (vs. positive) experiences boost intergroup categorizations. Attributional and linguistic processes might further contribute to asymmetries in evaluations (see Graf et al., 2014): Past research shows that negative behaviors typically elicit more spontaneous (Weiner, 1985), dispositional attributions than positive behaviors (Ybarra & Stephan, 1999), especially when attending to behaviors of outgroup (vs. ingroup) members (Hewstone, 1989). In addition, we know that these attributional processes are further compounded by abstract (vs. concrete) language (Maass, 1999) that is impervious to disconfirmation. Therefore, negative outgroup experiences may disproportionately affect evaluations of negative outgroups in varied settings because, beside heightening intergroup categorizations, these experiences trigger dispositional explanations that are transmitted socially with language that is abstract, de-contextualized, and hard to disprove. Future mediational tests should establish whether asymmetries in categorization, attribution, and language (and/or other processes advanced in the broader psychological literatures) uniquely and synergically contribute to valence asymmetries in generalized outgroup evaluations.

Good is Stronger than Bad When Learning about Positive Admired Outgroups

> *—In no area were we able to find a consistent reversal, such that one could draw a firm conclusion that good is stronger than bad…. We hope that this article may stimulate researchers to search for and identify exceptions; that is, spheres or circumstances in which good events outweigh bad ones* (Baumeister et al., 2001, p. 354, 362)

In this investigation, we sought exceptions to the 'bad is stronger than good rule', as Baumeister recommended, and —by assessing intergroup valence asymmetries in positive, admired outgroup domains—we succeeded in finding meaningful evidence for those

reversals that eluded his influential, early review of valence asymmetries in psychology.

While stereotyped responses towards occupational groups and student majors are hardly the concern of corrective interventions and large public campaigns, it is because our meta-analysis extended its reach to these positive outgroups (e.g., nurses; see Seta, Seta, & McElroy, 2003) that we were able to find those exceptions to the 'bad is stronger than good' rule in intergroup relations and shed new lights over the motivational drivers of intergroup valence asymmetries in ways that had not been possible before (i.e., studies in Table 1).

Just one third of our experimental tests (18 out of 54) contributed to a marginal positive valence asymmetry for positive, admired outgroups in our model without covariates. The difference between the positive outgroup-positive experience experiments and the positive outgroup-negative experience experiments however reached ordinary levels of significance when controlling for three of the four design parameters (i.e., type of outgroup, type of DV, place of research vs. affective-cognitive basis of the DV) that covaried (weakly) with the test's focal independent variable (aka. experience valence), suggesting that positive valence asymmetries for admired outgroups were able to emerge when accounting for the slight uneven representation of impression formation experiments across the levels of the additional design parameters.

The significant dis-ordinal interaction between experience valence and outgroup valence we detected (with and without control of covariates) confirms the psychological centrality of people's valenced expectations about outgroups in outgroup-relevant domains. Together, our findings indicate that people's responses to positive, admired outgroups are influenced more by positive, than by negative experiences—*so for positive, admired outgroups, good is stronger than bad*.

This meta-analytical finding for positive valence asymmetries adds to the sparse evidence for positive asymmetries in impact (e.g., Baumeister & Cairns, 1992; Korn,

Rosenblau, Buritica, & Heekeren, 2016; Mischel et al., 1976; Sedikides & Green, 2000; Skowronski & Carlston, 1987; Skowronski et al., 2014). It also extends earlier work on the self-fulfilling qualities of transactions with outgroup members. While previous research in this area shows that group-level expectations bias information processing as well as responses to individual group members in expectation-confirming ways (e.g., Snyder, Tanke, & Berscheid, 1977; Word, Zanna, & Cooper, 1974), our research demonstrates that these confirmation biases spread out through individual-to-group generalization to affect generalized views of outgroups and, thus, have wider and potentially more far-reaching influences on broad intergroup dynamics.

In this, our findings align well with Deegan et al. (2015). In one of their studies, Deegan and colleagues used a minimal group paradigm with a research confederate to manipulate both participants' *expectations* about the quality of an upcoming interaction with an outgroup member and the *quality of the interaction itself*. While their participants always reported expectations and ratings of interaction quality that fell on the positive side of the valence spectrum (i.e., their design gauged only a section of ours), variations in expectation quality and interaction quality still mattered: Those who had developed more positive expectations about the upcoming interaction reported more positive group-level evaluations of the outgroup after a positive intergroup interaction, than after a less positive intergroup interaction. Among those who had less polarized positive expectations, the quality of the positive interaction made no difference on their group-level evaluations. The positive valence asymmetries we detected meta-analytically in this contribution for positive outgroups provide credit to Deegan et al.'s results for the self-fulfilling downstream consequences of valenced expectations for experiences with outgroups. More broadly, our results demonstrate that valence asymmetries in individual-to-group generalization are context dependent and follow an evaluative fit principle. Therefore, they are significantly moderated by valenced

expectations and can reverse when people hold positive expectations.

Evaluative fit effects are at the core of epistemic defense explanations, like theories of schema congruency (e.g., Abelson et al., 1968; Bruner, 1957, Roets et al., 2015; Rothbart et al., 1979); they also provide the cognitive foundation to influential social psychological theories (e.g., Coates et al., 2006; Paolini et al., 2014; Reynolds et al., 2000; Turner et al, 1987). As we discussed in the introduction, these effects are less consistent with biological and social psychological theories that prioritize risk appraisals and concerns about physical/psychological integrity, over other evolved needs and motives (e.g., Bateson, 2002; Del Giudice et al., 2015; for overviews, see Baumeister et al., 2001; Neuberg et al., 2011; Öhman & Mineka, 2001; Stephan, 2014; Stephan & Stephan, 2000).

Finding evaluative fit effects of similar size in positive and negative outgroup domains as we did in our ancillary tests of symmetry is inconsistent with social psychological predictions that ingroup enhancement considerations will further modulate evaluative fit effects and valence asymmetries (Oakes et al., 1994; Tajfel, 1980: Turner et al., 1987). While we recognize that for this specific conclusion we rely on the implications of null findings (rather than on positive evidence), and notwithstanding the limited power in our analyses, it remains that we did *not* find any strong evidence that evaluative fit is biased towards negativity, as social identity and self-categorization theory would predict. In other words, the participants included in the meta-analysis did not display an obvious preference for achieving and maintaining negative views of outgroups; instead they seemed to be equally concerned about maintaining their positive *and* negative knowledge structures and expectations about outgroups. It is important to recognize, however, that standard impression formation paradigms, which include group-level judgments of the outgroup, but exclude an assessment of group-level judgments of the ingroup, may provide a sub-optimal testing ground for truly *intergroup* explanations of valence asymmetry, like that offered by social identity and self-

categorization theories' notion of ingroup enhancement. This is because outgroup-only designs provide individuals with a limited range of viable options for strategic responding to experiences with outgroup members that challenge or frustrate their desire for positive ingroup distinctiveness (for an overview of this broader range of strategic options, see Rubin, Hewstone, & Voci, 2001; see also Doosje et al., 1998; Doosje, Spears, Ellemers, & Koomen, 1999). When faced with positive information about the outstanding qualities and achievements of individual outgroup members, individuals motivated to protect their ingroup's positive standing can engage in various cognitive strategies aimed at discounting or subtyping this information in order to limit its positive impact on generalized views of the outgroup (Kunda & Oleson, 1995; Moreno & Bodenhausen, 1999). In addition or alternatively, they might respond to this threat to their ingroup's positive distinctiveness by strategically re-appraising the *ingroup* and boosting their ingroup evaluations (e.g., lifting the ingroup's position on those or related judgments dimensions) so to further or better protect their group superiority or minimize their relative disadvantage. The standard impression formation paradigms used in most stereotype change research and synthesized here did not include measures of *in*group generalization and did not express intergroup bias in terms of ingroup-outgroup differences. Thus, it is impossible to know whether they missed out on the full breadth of participants' strategic responses at the service of ingroup enhancement and therefore offered less-than-incisive tests for this (vs. the other two) explanations for valence asymmetry in intergroup settings.

Overall, looking at our results from the perspective of competing explanations for intergroup valence asymmetries, the balance from available impression formation experiments favors theories placing a focus on the centrality of valenced expectations, over theories placing a premium on risk appraisals. The evidence is less conclusive (but nevertheless still present) regarding the primacy of epistemic defense considerations over

ingroup enhancement considerations. We see some obvious next steps in future research agendas: Forthcoming prospective experiments should pit epistemic defense against ingroup enhancement directly, with more precision (e.g., with designs that appraise outgroup and ingroup evaluations), and more statistical power than we were able to achieve with our retrospective, secondary (meta-analytical) analysis of past research; future tests should also go beyond the inspection of overall generalization patterns and assess the involvement of the three motivational drives we focused on here directly (e.g., through experimental manipulation) and in a variety of intergroup settings—including those non-individualistic societies that failed to enter this analysis. The present investigation marks the beginning, and we hope will also help delineate the way forward towards a deeper understanding of the motivational substrate of intergroup valence asymmetries and individual-to-group generalizations.

Evidence of Generalization Invariance (vs Moderation) by Other Design Parameters

Future research efforts should establish whether this supremacy of epistemic defense over alternative motivational underpinnings of intergroup valence asymmetry replicates across research methods. We had limited statistical power in this meta-analysis to ascertain whether key design parameters we coded for (e.g., type of control, time lapse between outgroup experience and DV, etc.) would moderate the focal valence asymmetries. Yet, we demonstrated that our key interaction and simple effects resisted, and often stood up clearer, when controlling for these parameters (see Table 6b for analyses with covariates). Prior to our main tests, we also checked whether the additional design parameters moderated individual-to-group generalizations (irrespective of experience and outgroup valence). These ancillary analyses returned a set of null findings (see also McIntyre et al., 2017). Hence, generalizations instigated by impression formation experiments are substantially invariant and equally robust across several methodological variations.

Surprisingly, the cognition-affect dichotomy did not moderate our meta-analytical findings (see Table 5): Our participants were equally willing to revise their views of the outgroup after cognitive *and* affective experiences, to revise views of cognitive-based outgroups *and* affective-based outgroups, on cognitive, as well as on affective, indicators of generalization. The null findings for type of experience, basis of outgroup, and affective-cognitive dependent variables go against evidence of moderation by cognition and affect documented in intergroup contact research (cf. Paolini et al., 2007; Pettigrew, Tropp, Wagner, & Christ, 2011; Tropp & Pettigrew, 2005b; for similar effects in other areas, see Haddock, Zanna, & Esses, 1993; Huskinson & Haddock, 2004; Giner-Sorolla, 2005; Park & Judd, 2005; Trafimow & Sheeran, 1998). Also, contrary to extant intergroup contact research, we found no moderating effects by type of outgroup (e.g., ethnic/national, aging/disability, etc.; cf. Pettigrew & Tropp, 2016), or by outgroup status (e.g., outgroups of lower vs. higher status, relative to the participants' ingroup; Tropp, 2006; Tropp & Pettigrew, 2005a). These empirical discontinuities between distinct generalization traditions confirm a central point made by Harwood's (2010) contact space that different types of outgroup experience are not psychologically isomorphic; they are driven and most likely modulated by qualitatively different processes or mechanisms (see also Crisp & Turner. 2011; Turner, Hewstone, Voci, Paolini, & Christ, 2007).

We did wonder whether there is even sufficient variance *within* the social cognitive tradition for an incisive test of this dichotomy. It is fair to characterize impression formation paradigms as 'cognitively focused' (McIntyre et al., 2017): These laboratory-based experiments expose participants to relatively unthreatening and uncomplicated information about outgroup members, away from expectations of face-to-face contact with these or other individuals, and in laboratory settings that mute historical group inequalities, conflict and threat appraisals. As we suspected (see also Hewstone, 1996; Park & Judd, 2005), the

sampled impression formation experiments displayed an over-representation of cognitive-laden experiences with outgroup members (44 written vs. 15 visual or audio) and an over-use of cognitive indicators of outgroup bias (38 cognitive: stereotypicality/dispersion vs. 21 affective/prejudice), but no obvious preference for cognitive, over affective, outgroups (as established through pilot testing; 23 cognitive vs. 32 affective; see Table 5).

Given that our data pool is cognitively laden, we cannot exclude that the relative primacy of epistemic defense we isolated in this meta-analysis could not tilt in favor of risk aversion and/or ingroup enhancement explanations when individual-to-group generalizations are assessed in more threatening and emotion-laden contexts -- like those that inject explicit or implicit threats to the safety and/or value of the individual or ingroup. Findings from social neuroscience suggest that this caution is perhaps warranted: There is growing evidence that highly affective outgroup experiences activate qualitatively different brain structures and neural systems from cognitively-laden outgroup experiences (e.g., Amodio & Devine, 2006; Amodio & Ratner, 2011; Ito & Bartholow, 2009, Chekroud, Everett, Bridge, & Hewstone, 2014; cf. Van Bavel, Xiao, & Cunningham, 2012). Furthermore, some scholars have speculated that these brain specializations for affective (vs. colder cognitions) might extend their reach to qualitatively different motivational orientations in intergroup settings (Jarymowicz & Bar-Tal, 2006).

The amygdala, a subcortical brain structure associated with affect-related learning and memory, has been found to be strongly activated during learning of intergroup anxiety (Amodio, Harmon-Jones, & Devine, 2003; Phelps et al., 2000) and its increased activity has been interpreted as reflecting the organism's attention being deployed towards the rewarding and the threatening—positive and aversive—aspects of a stimulus (Checkroud et al., 2014; Davis & Whalen, 2001; Holland & Gallagher, 1999). Hence, these brain structures and system should be most active when risk aversion or ingroup enhancement motivations are at

stake—and perhaps by extension, when the individual is experiencing highly affective contact with outgroup members—because it is under these motivational states and in these specific circumstances that threat and evaluative appraisals should be spontaneously emitted (Bargh, Ollwitzer, & Ettingen, 2010). The extraction and processing of cognitive dimensions of outgroup stimuli—that now we know are highly salient in experiences like those captured by impression formation experiments—would rest instead with neocortical regions that support the forming, storing, and retrieval of conceptual/semantic (vs. evaluative) associations, like the left posterior prefrontal cortex, the left temporal lobe, and medial temporal lobes (Gabrieli, 1998; Martin, 2007; see Ito & Bartholow, 2009). Hence, these other brain regions should be most active when epistemic motivations are salient, in (more cognitively weighted) socially mediated experiences of outgroups, and when individuals and groups are capable of transcending concerns of survival or supremacy (Jarymowicz & Bar-Tal, 2006).

At this point it is unclear whether these brain specializations are responsible for the dissociation in generalization findings between the social cognitive and the intergroup contact traditions, as well as for the relative primacy of epistemic defense, over 'hotter' (risk aversion and ingroup enhancement) motivations that we contributed to identify with this meta-analysis. We hope that future research will establish this. These results, however, already invite generalization researchers to actively explore the intricacies of the complex interplay between intergroup affect and cognitions in the brain as experiences with outgroup members take place, or in different experimental contexts.

Negative (and Less Negative) Implications for Intergroup Trajectories of Change

The robust and fully significant meta-analytical evidence we found for negative valence asymmetry with negative outgroups demonstrates that there is an inherent readiness in people's psychology for the negative spiraling of intergroup dynamics with stigmatized

outgroups. Our tests for positive outgroups were underpowered, yet when cleared from methodological covariates returned a significant positive valence asymmetry pointing towards a parallel preparedness for virtuous trajectories of incremental positive changes in interactions with outgroups that already enjoy privileged and safe standing in society. Therefore, *bad seems to naturally lend itself to worse and good to better in intergroup relations.*

Our meta-analytical data afford us to conclude with some confidence that, to date, epistemic defense explanations offer the most parsimonious and integrative account for valence asymmetries in experimental, laboratory-based tests of individual-to-group generalization. Risk aversion explanations demonstrated the weakest explanatory power, and ingroup enhancement theories fell somewhere between. Yet, our original analysis of contrasting predictions, as summarized in Figure 1, warns at the mere logical level against any easy and simple ranking of motivational forces that is context invariant (Maslow et al., 1970; see also Kwang & Swann, 2010; cf. Sedikides, 1993 in research on self-motives). The substantial convergence between all explanations for negative valence asymmetry with negative outgroups, and the part-overlap between epistemic defense and ingroup enhancement explanations for positive outgroups leaves open the tantalizing and intriguing (but yet untested) possibility that, as they stand, most transactions with members of outgroups may in fact satisfy individuals' *multiple* needs and motives *simultaneously*. As long as people actively seek situations that allow them to express their needs and dispositions (Emmons, Diener, & Larsen, 1986) and they experience conflicting motivations as aversive (Kwang & Swann, 2010), the simultaneous satisfaction of multiple motives and needs might contribute to an overall motivational *resistance* to change the course of intergroup responses, and a relative stability and robustness of these valence asymmetries' trajectories over time.

The existence of motivational forces that counteract and resist positive changes in

negative intergroup domains however do not altogether exclude them. In this meta-analysis, positive experiences with outgroup members reliably improved evaluations of both valued and devalued groups. However, we do not know whether in these experiments the seeds of positive change were also planted in *unexplored* and untapped outcome measures. A particularly interesting case is that of individuals' appetite for engaging in collective action that alleviates social disadvantage. There is some intergroup contact evidence suggesting that positive interactions with outgroup members—while improving attitudinal responses to outgroups—at times have detrimental consequences on behavioral intentions and action: Positive intergroup interactions can decrease minority individuals' willingness to engage in collective action that redresses their disadvantage (Dixon, Durrheim, & Tredoux, 2007; Saguy, Tausch, Dovidio, & Pratto, 2009). Hence, while our meta-analysis demonstrates that negative outgroup experiences worsen *evaluations* of negative outgroups more than positive experiences improve them, we cannot rule out the possibility that these negative experiences did not also fuel the engine of collective action and positive social change in our participants (see e.g., Laurence, Schmid, & Hewstone, 2017), although the null findings in our moderation analyses for variables typically implicated in the contact-collective action link (i.e., outgroup status, outgroup type indexing boundary permeability and stereotype strength) suggest that this is improbable. Prospective and targeted generalization research that looks beyond prejudice reduction outcomes (Dixon & Levine, 2012; Pettigrew & Tropp, 2011; Wright & Lubensky, 2009) will be in a stronger position, than the research synthetized here, to ascertain whether valence asymmetries on collective action can possibly revert the pessimistic implications of valence asymmetries on evaluations.

The booming use of social media and on-line communication in contemporary societies has exponentially increased the number of non-face-to-face interactions, and consequently increased the prevalence of socially mediated exposure to outgroups like those

we focused on in this work (McIntyre et al., 2017). Possibilities for positive changes in intergroup relations can however be identified in the mix of the findings and among the moderators of the disparate correlational field tests of valence asymmetry in direct, face-to-face intergroup contact we started this article with (see Table 1), or can be inferred from meaningful design differences between tests of generalization in those contact studies and in the impression formation experiments we focused on. Ordinary intergroup experiences in the field breed a host of personal and situational cues for valence appraisals that are simply not available to the standard participant in impression formation experiments (see Graf et al., 2014). In these contexts, for example, the negativity of the intergroup exchange can be attributed to stable qualities and/or the changeable properties of any individual involved (including the self), as well as to any complex dynamic and time course aspect of the exchange (see Kunda, Davies, Adams, & Spencer, 2002; e.g., inferences about the individual's and groups' past). This rich tapestry of ambiguous attributional cues is embedded in an equally complex net of situational cues (e.g., perceptions of relationships' stability, legitimacy, etc.). These attributional processes might serve the basis for positive changes and counteract negative valence asymmetries by offering the ground for positive outgroup appraisals. In unmonitored and unstructured settings, away from experimenter's control and specific task instructions, there should also be greater scope to pursue motivations other than those we assessed in this meta-analysis. If sufficiently salient and rewarded, novelty seeking and exploratory motives, endeavor-related personality traits (Stürmer et al., 2013), and self-expansion motives (Dys-Steenbergen, Wright, & Aron, 2016), if not capable of shortcutting evaluative fit effects, may allow alternative intergroup responses to emerge and compete with these defaults.

While negative experiences with outgroup members may retain greater impact on many dimensions of intergroup affect, cognitions and behaviors, their adverse effects might

be significantly mitigated by positive valence asymmetries in preferences and in prevalence. Because positive experiences are preferred, and thus actively sought and perhaps even instigated over negative experiences (Boucher & Osgood, 1969; Matlin & Stang, 1978), positive experiences might become more prevalent in the ecology of people's daily experiences with outgroups. Initial findings from our research laboratory (Graf, Paolini, & Rubin, 2014; Husnu & Paolini, in press) are consistent with this idea of antagonistic relationships between different valence asymmetries contributing to some optimism. In our research, we returned to Cyprus where we had detected negative valence asymmetries in influence on social categorization (see Paolini et al., 2014 Study 4) to use a novel paradigm that allows individuals to freely choose between engaging in positive or in negative intergroup imagery (aka. imagining positive vs. negative experiences with a stranger outgroup member; Husnu & Paolini, in press). Despite this context being characterized by entrenched intergroup conflict and our sample consisting of Cypriots with significant past history of direct and/or vicarious intergroup trauma with the intergroup counterpart, we found a marked preference for engaging in positive, over negative, intergroup imagery. Moreover, those assigned to an unvalenced condition and thus free to stir their mental visualizations of outgroups any direction they wanted, opted to take them to the positive, and not the negative, side of the valence spectrum. We argued and demonstrated elsewhere (Graf et al., 2014) that naturalistic intergroup settings can sustain the gradual accumulation of (however slim) positive changes in intergroup relations and the progressive erosion of intergroup animosity through the greater prevalence of positive (vs. negative) intergroup experiences. A growing body of evidence indicates that negative experiences with outgroup members are significantly outnumbered by positive experiences in many peaceful Western societies (Barlow et al., 2012; Bekhuis et al., 2013; Dhont & Van Hiel, 2009; Graf et al., 2014; Pettigrew, 2008) and possibly also in some post-conflict settings (Husnu & Paolini, in press).

Overall, this preliminary evidence for antagonistic relationships between different types of valence asymmetry seems to suggest that positive asymmetries in preference and prevalence might assist in neutralizing the adverse consequences of negative asymmetries in influence. Hence, the disproportionate damaging impact of being exposed to negative experiences with outgroup members could be mitigated by positive outgroup experiences that the individual likes to either mentally fabricate, looks for, instigates or just naturally appraises in their more ordinary daily intergroup experiences. Field work that assesses these three types of asymmetry is needed.

Concluding Remarks

Curiously, the journey we embarked on with this article brought us back to where we first started it, in a full research arc: This article started with an overview of correlational field studies. It then moved onto a synthesis of laboratory-based experiments. It now encourages a return into the field. We initially moved away with our meta-analysis from naturalistic settings because there were not enough studies there to contrast distinct motivational explanations of intergroup valence asymmetries in outgroup evaluations and because we needed to free our analysis from the biasing influences of self-selection biases, the confusion around reversed causation, and the host of confounding variables potentially afflicting any individual direct test of valence asymmetry. This approach gave us greater confidence in the existence of valence asymmetries in impact or influence that follow an evaluative fit mechanism—whereby bad is stronger than good for stigmatized outgroups but good is stronger than bad for admired outgroups. We believe, the time is now ripe, to initiate a serious investigation of those key, natural 'confounding' variables operating in the ecologies of daily intergroup interactions that can create a space less subject to the tyranny of negative valence asymmetries and evaluative fit effects, and most open to the building of alternative and positive intergroup realities.

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Footnotes

1. Evaluative fit is a prominent but not the only mechanism advanced within the vast psychological literature on valence asymmetry; a variety of other psychological mechanisms have been discussed, and at times put to empirical test (for more comprehensive reviews, see Baumeister et al., 2001; Kellerman, 1984; Rozin & Royzman, 2001; Skowronski & Carlston, 1989; Taylor, 1991). Among others, these mechanisms include mood-congruence effects (Baumeister et al., 2001, p. 356), infrequency-driven salience (Kellerman, 1984), valenced information's extremity, distance from modal responses (Kellerman, 1984; see also Fiske, 1980), contrast (and assimilation) effects due to anchoring (Helson, 1964; Sherif & Sherif, 1967), informativeness (Fiske, 1980; Rozin & Royzman, 2001), trait-category diagnosticity (Skowronski & Carlston, 1989; see also Nisbett, Zukier, & Lemley, 1981), range of behavior's implications or information's ambiguity (Wyer, 1973), contagiousness or penetrance (Rozin & Royzman, 2001), behaviour's costs (Kanouse & Hanson, 1972), selective rehearsal (Matlin & Stang, 1978), greater cognitive elaboration (Rozin & Royzman, 2001), and minimization (Taylor, 1991). Most scholars agree that there is no single mechanism underpinning all types of valence asymmetry and moderating effects documented in the literature (for an overview, see Table 2; see again: Baumeister et al., 2001; Kellerman, 1984; Rozin & Royzman, 2001; Skowronski & Carlston, 1989; Taylor, 1991) and some mechanisms might be more suited to explain certain types of asymmetry (Rozin & Royzman, 2001). Here, we focus on evaluative fit because of this mechanism's theoretical prominence, parsimony, and explanatory power in accounting for meaningful variations in intergroup valence asymmetries and individual-to-group generalizations as a function of outgroup valence.
2. It is important to recognize that social identity and self- categorization theories do not

depart from explanations of evaluative fit based on epistemic defense. Rather they incorporate and build on these explanations to include the compounding influence of ingroup enhancement motives (see e.g., Doosje et al., 1998; see Spears & Manstead, 1989). Also, we should stress that our contrasting pitch for explanations based on risk aversion, epistemic defense, and ingroup self-enhancement does not exclude the possibility of an evolutionary basis to each and all the underpinnings for valence asymmetry discussed here (i.e., not only risk aversion; see Giles, Reid, & Harwood, 2010 for broader interfacing of evolutionary and social psychological theories; see Taylor, 1984 for a similar stance within the valence asymmetry literature).

3. Unlike risk aversion and epistemic defense accounts, ingroup enhancement theories are *intergroup* accounts of valence asymmetry and thus explain these effects in the context of ingroup-outgroup dynamics. In this contribution, we focus solely on predictions for individual-to-*out*group generalizations and, for simplicity, omit a consideration of individual-to-*in*group generalizations, although these other generalizations are plausible and potentially relevant to an incisive test of these intergroup theories. We chose this outgroup-only focus when articulating our predictions because our focal research questions stemmed from the intergroup contact literature and led us to synthesize data from the stereotype change literature. The most established research paradigms in these traditions include exclusively assessment of outgroup evaluations (see Paolini, Hewstone, Rubin, & Payne, 2004 for a discussion) and omit ingroup evaluations. We come back to this point in the Discussion section.
4. Deegan and colleagues (2015) recently studied responses to presumably positive or not explicitly negative lab-created outgroups (global and analytical thinkers in Study 3; under-estimators and over-estimators in Study 4). However, their work is unsuitable for a stringent test of valence asymmetry in positive outgroup domains. In

both of their studies, interactions between members of opposing groups always fell in the positive side of the valence spectrum and results were reported in ways that do not allow direct appraisals of valence asymmetry. Hence these studies are not included in Table 1; but we return to them in the Discussion.

5. We did not search foreign language sources as access to translating services was beyond the funding available for this research. However, if non-English papers were located using our search strategies, they were included. For example, Wänke, Bless and Wortberg (2003) was translated from German to English to check for eligibility and then included in our pool of experiments.

6. The full list of terms and keywords was: Generalization, member-to-group, individual to group, exemplar to class, exemplar to group, stereotype reduction, stereotype change, prejudice reduction, induction, inductive reasoning, cognitive process of induction, connectionism approach, and impression formation.

7. There were four tests that used a mixed modality; these were classified based on the modality of highest richness and self-involvement used (Harwood, 2010). For example, Andrews, Yogeeswaran, Walker & Hewstone (under review) used a video clip supplemented with written contents; hence it was coded as 'visual'.

8. We repeated these analyses without data from the within-subject experiments (which had all failed to provide correlations between the paired observations; Borenstein et al., 2009) to check that these data had not unduly biased our results. The key results for outgroup valence and experience valence were substantially unchanged 'with' and 'without' data from the within subjects experiments with incomplete stats reporting: negative, stigmatized outgroups with/without, $r = .27$, $g = .54$, $p < .001$ vs. $r = .27$, $g = .56$, $p < .001$; positive, admired outgroups with and without: $r = .31$, $g = .65$, $p < .001$; negative experiences with/without: $r = .28$, $g = .59$, $p < .001$ vs. $r = .27$, $g = .57$,

$p < .001$; positive experiences with/without: $r = .28$, $g = .56$, $p < .001$ vs. $r = .29$, $g = .61$, $p < .001$. Given this equivalence of results and in light of the limited power, we retained experiments with part reporting of stats in all analyses.

Table 1. *Published Tests of the Relationship between Positive/Negative Contact and Generalized Outgroup Evaluations Return Mixed Findings*

Publication/Study	Respondents' Sample	Target Outgroup	Asymmetry	Contact Valence Indicator	Index Type	Analysis type	Negative Contact Effect	Positive Contact Effect	Outgroup Eval Indicator
Barlow et al. (2012), Study 1	Non-Black Australians from community	Black Australians	NA^	Contact quality	U	SS	.15**	.07*	Racism
Barlow et al. (2012), Study 1	Non-Black Australians from community	Muslim Australians	NA^	Contact quality	S	SS	.16**	-.07	Prejudice
Barlow et al. (2012), Study 1	Non-Black Australians from community	Asylum Seekers	NA^	Contact quality	S	SS	.49***	-.37***	Prejudice
Barlow et al. (2012), Study 2	White Americans from community	Black Americans	NA^	Positive/negative contact quantity	S	PR	.27***	-.15*	Modern Racism
Barlow et al. (2012), Study 2	White Americans from community	Black Americans	NA^	Positive/negative contact quantity	S	PR	.24***	-.13**	Old-fashioned Racism
Barlow et al. (2012), Study 2	White Americans from community	Black Americans	NA^	Positive/negative contact quantity	S	PR	-.25***	-.16**	Issue Avoidance
Barlow et al. (2012), Study 2	White Americans from community	Black Americans	NA^	Positive/negative contact quantity	S	PR	.20***	-.16**	Contact Avoidance
Barlow et al. (2012), Study 2	White Americans from community	Black Americans	NA^	Positive/negative contact quantity	S	PR	.11*	-.09	Suspicion about Obama
Bekhuis, Ruiter, & Coenders (2013)	Dutch secondary school pupils	Ethnic outgroups in class	noA	Contact positivity-neutrality-negativity	S	PR	.19**	-.16**	Outgroup contact avoidance
Bekhuis, Ruiter, & Coenders (2013)	Dutch secondary school pupils	Ethnic outgroups in school	PA	Contact positivity-neutrality-negativity	S	PR	07	-.13*	Outgroup contact avoidance
Bekhuis, Ruiter, & Coenders (2013)	Dutch secondary school pupils	Ethnic outgroups in sports clubs	noA	Contact positivity-neutrality-negativity	S	PR	.05	-.03	Outgroup contact avoidance
Bekhuis, Ruiter, &	Dutch secondary school	Ethnic	NA	Contact positivity-	S	PR	.16**	-.08	Outgroup contact

Coenders (2013)	pupils	outgroups in neighborhood		neutrality-negativity					avoidance
Dhont & Van Hiel (2009), Study 2	Belgians nationals from community: High RWA	Immigrants	NA^	Frequency of positive/negative contact	S	SS	.50***	-.35**	Blatant racism
Dhont & Van Hiel (2009), Study 2	Belgians nationals from community: Low RWA	Immigrants	noA^	Frequency of positive/negative contact	S	SS	.06	-.10	Blatant racism
Dhont & Van Hiel (2009), Study 2	Belgians nationals from community: High SDO	Immigrants	NA^	Frequency of positive/negative contact	S	SS	.43***	-.33**	Blatant racism
Dhont & Van Hiel (2009), Study 2	Belgians nationals from community: Low SDO	Immigrants	noA^	Frequency of positive/negative contact	S	SS	.12	-.09	Blatant racism
Graf, Paolini, Rubin (2014)	Austrian, Czech, German, Polish, Slovakian university students	National outgroup	NA	Contact partner positivity/negativity	S	PR	-.22***	.03	Attitudes thermom.
Graf, Paolini, Rubin (2014)	Austrian, Czech, German, Polish, Slovakian university students	National outgroup	NA	Contact partner positivity/negativity	S	PR	-.15**	.08	Attitudes semantic
Graf, Paolini, Rubin (2014)	Austrian, Czech, German, Polish, Slovakian university students	National outgroup	NA	Contact situation positivity/negativity	S	PR	-.13***	.10***	Attitudes thermom.
Graf, Paolini, Rubin (2014)	Austrian, Czech, German, Polish, Slovakian university students	National outgroup	noA	Contact situation positivity/negativity	S	PR	-.10***	.10***	Attitudes semantic
Hayward et al. (2017), Study 1	White Americans	Black Americans	NA	Frequency by intensity of	U	PR	.04**	-.01**	Anti-black symbolic attitudes

				positive/negative interactions					
Hayward et al. (2017), Study 1	White Americans	Black Americans	noA	Frequency by intensity of positive/negative interactions	U	PR	-.07**	.09**	Outgroup attitudes
Hayward et al. (2017), Study 2	Black and Hispanic Ameticans	White Americans	NA^	Frequency by intensity of positive/negative interactions	U	PR	.09**	-.03**	Anti-White atitudes
Hayward et al. (2017), Study 2	Black and Hispanic Ameticans	White Americans	PA^	Frequency by intensity of positive/negative interactions	U	PR	-.03*	.09**	Outgroup liking
Hayward et al. (2017), Study 3	American participants	Fictitious outgroup	NA^	Positive/negative (vs. neutral) imagined contact	M	MDN	1.10		Negative outgroup stereotyping
Hayward et al. (2017), Study 3	American participants	Fictitious outgroup	NA^	Positive/negative (vs. neutral) imagined contact	M	MDN	1.03		Outgroup liking
Pettigrew (2008)+	German adult respondents from representative community sample	Foreigners	PA^	Positive and negative behaviours by foreign resident	S	ZO	.30	-.41	Anti-Muslim prejudice
Stark, Flache, & Veenstra (2013) Study 1	Dutch and Moroccan, primary school children in the Netherlands	Turkish outgroup	noA^	Interpersonal liking and disliking of outgroup classmates	S	PR	-.15#**	.20**	Outgroup attitudes
Stark, Flache, & Veenstra (2013) Study 1	Dutch and Turkish primary school children in the Netherlands	Moroccan outgroup	noA^	Interpersonal liking and disliking of outgroup classmates	S	PR	-.23#*	.15*	Outgroup attitudes
Stark, Flache, & Veenstra (2013)	Moroccan and Turkish primary school children	Dutch outgroup	noA^	Interpersonal liking and disliking of	S	PR	-.15#	.22*	Outgroup attitudes

Study 1	in the Netherlands			outgroup classmates					
Stark, Flache, & Veenstra (2013) Study 2 $	Dutch and Moroccan, primary school children in the Netherlands	Turkish outgroup	noA^	Interpersonal liking and disliking of outgroup classmates	S	PR	-.09#**	.10**	Outgroup attitudes: wave 2
Stark, Flache, & Veenstra (2013) Study 2 $	Dutch and Turkish primary school children in the Netherlands	Moroccan outgroup	noA^	Interpersonal liking and disliking of outgroup classmates	S	PR	-.06#(*)	.06(*)	Outgroup attitudes: wave 2
Stark, Flache, & Veenstra (2013) Study 2 $	Moroccan and Turkish primary school children in the Netherlands	Dutch outgroup	noA^	Interpersonal liking and disliking of outgroup classmates	S	PR	-.12#**	.12**	Outgroup attitudes: wave 2
Stark, Flache, & Veenstra (2013) Study 2 $	Dutch and Moroccan, primary school children in the Netherlands	Turkish outgroup	noA^	Interpersonal liking and disliking of outgroup classmates	S	PR	-.08#*	.08*	Outgroup attitudes: wave 3
Stark, Flache, & Veenstra (2013) Study 2 $	Dutch and Turkish primary school children in the Netherlands	Moroccan outgroup	noA^	Interpersonal liking and disliking of outgroup classmates	S	PR	-.07#(*)	.06(*)	Outgroup attitudes: wave 3
Stark, Flache, & Veenstra (2013) Study 2 $	Moroccan and Turkish primary school children in the Netherlands	Dutch outgroup	noA^	Interpersonal liking and disliking of outgroup classmates	S	PR	-.13#**	.13**	Outgroup attitudes: wave 3

Note: Asymmetry: NA = negative asymmetry (negative > positive), noA = no asymmetry (negative = positive), PA (negative < positive). ^ identifies studies that have included formal statistical assessment of valence asymmetry; other included studies report results in ways that allow assessment of asymmetry (cf. Deegan et al., 2015). Index type: U = unstandardized, S = standardized, M = means; Analysis type: SS = simple slope analysis' regression coefficients probing interaction effect, PR = partial regression coefficients extracted from larger regression model; ZO = zero-order correlations. MDN = mean difference of negative contact (relative to neutral) and positive contact (relative to neutral), . + similar results from same dataset also reported in Pettigrew & Tropp (2011). $, % identifies a study using a longitudinal vs. experimental design, respectively; otherwise all tests are cross-sectional correlational. # indicates a coefficient that was reversed coded so that high values indicate high disliking. ~ manipulated negative contact resulted in neutrally valenced experience.
(*) $p < .10$,* $p < .05$, ** $p < .001$, *** $p < .0001$.

Table 2. *Psychological Research that Has Identified Positive Valence Asymmetries, Moderators of Negative and Positive Asymmetries on Indicators of Influence, Prevalence, and Preference.*

Research Area	Effect of Interest	Asymmetries and Moderators of Positive vs. Negative Asymmetry (PA vs. NA)	Type of Asymmetry	Research Synopsis
Language	Labelling of dichotomous valenced dimensions	PA	prevalence	The positive term in a positive-negative pair is the term that is used to define the dimension defined by the pair (e.g.., strength in the strong-weak pair, happiness in the happy-sad pair; Rozin & Royzman, 2001). In most languages, the positive term typically precedes the negative term in opposite comparisons (e.g., more or less, win or lose; Rozin & Royzman, 2001)
Decision making	Judgment formation	PA	influence	Psychological anchor points for many judgment dimensions are slightly to the positive side of true neutral (for an overview, Parducci, 1968)
Language and person perception	Frequency of valenced traits	NA: trait	prevalence	Negative emotional personality traits are more prevalent than positive emotional personality traits, but positive nonemotional personality traits are more prevalent than negative nonemotional traits (Averill, 1980).
Language and person perception	Frequency of valenced words	PA	prevalence	People might prefer positive ideas and conclusions (so called, “Pollyanna hypothesis”; Boucher & Osgood, 1969), thus they typically use evaluatively positive words more frequently than evaluatively negative words in communication, when describing or judging others (e.g., Adams-Webber, 1977; Benjafield, 1984; Peeters, 1971; Tuoby & Stradling, 1987); negative words most often reflect a positive root that becomes negative by a prefix (e.g., *un*pleasant) rather than the reverse (Matlin & Stang, 1978; see also Boucher & Osgood, 1969).
Person perception	Likeability judgments from behaviors	NA: behavior extremity and potency	influence	Negative behaviors have greater impact on likeability, than positive behaviours, especially for extreme (Fiske, 1980) and potency-related behaviours (Vonk, 1996).
Person perception	Behavior-trait inferences.	NA: others’ behavior valence	influence	Individuals make more spontaneous and faster trait inferences from other participants’ happy, rather than sad behaviour (Krull & Dill, 1998).
Person and group perception	Behavior-trait inferences	PA: trait, behavior type, target	influence	High-ability traits violate the pattern of few-instances-to-confirm/many-to-disconfirm displayed by highly unfavorable traits; they require a moderate number of instances to confirm and fewer to disconfirm (see Rothbart & Park, 1986; Skowronski & Carlston, 1992; see also Anderson & Butzin, 1974; Surber, 1984see also Reeder, Messick, & van Avermaet, 1977; Reeder, 1979).

				Positivity bias for ability related behaviors (i.e., relevant to intelligence-stupidity; Skowronski, & Carlston, 1987) occur only when the behavior is inconsistent with regards to trait implications and more for individuals than group targets (Skowronski, 2002).
Person and group perception	Frequency of valenced behaviors	PA: target entitativity	prevalence	Standard frequency-estimate bias associated with illusory correlations (i.e., majority with disproportionate number of positive events) applies to individual and group targets of low entitativity but not to high entitativity targets (McConnell, Sherman, & Hamilton, 1997; Study 2; see also Skowronski, 2002)
Self-perception	Inferences about self-relevant valenced events	PA: age, culture, psychopathology	preference influence	Positive events associated with the self are attended more and explained more as due to stable, internal, and global factors, whereas negative events are attended less and explained more as due to unstable, external, and specific factors (see Korn et al., 2016). This pattern applies less to repressors (especially when provided the information privately, depressed (Seidel et al., 2012), anxious individuals or individuals with attention deficits, non-developmental samples, or Asian samples (Mezulis et al., 2004).
Self-perception	Self-directed exposure to valanced self-relevant information	NA: interaction expectation	preference	Negative self-relevant evaluations from others are monitored for longer time than positive self-relevant evaluations, especially when expecting to interact with the evaluator (Graziano, Brothen, & Berscheid, 1980).
Memory	Recall of valenced words and events.	PA: psychopathology, recall delay.	prevalence	Nondepressed individuals show a bias toward recalling better positively valenced stimulus words or events (Brewer, 1988); depressed individuals recall equal numbers of positively and negatively valenced words (for meta-analytical evidence, see Matt, Vázquez, & Campbell, 1992). Positivity biases in recall are accentuated by recall delays (Matlin & Stang, 1978).
Memory	Recognition of 'old' behaviors	PA/NA: target's group membership	prevalence	More accurate recognition of negative outgroup behaviors than positive outgroup behaviors; a reverse pattern observed for behaviors by ingroup members (Howard & Rothbart, 1980).
Self and memory	Memory for self- vs. other-relevant information	PA/NA: target; information domain and breadth, event typicality	preference prevalence	Negative self-referent information is processed more shallowly and is remembered less well than other-referent information in personality and minimal feedback settings (Mischel, Ebbesen, & Zeiss, 1976; Sedikides, & Green, 2000). Valence asymmetries in recall were absent for friend-referent everyday events and self-relevant highly typical and highly atypical events; a positive valence asymmetry in recall was found for self-relevant moderately atypical events (Skowronski, Bets, Thompson & Shannon, 1991).

Self and health	Prediction of future life events	PA: Self vs. other as target of estimates.	prevalence	Estimates of above-average chances for positive life events and below-average for negative life events (Weinstein, 1980; for a review, see Taylor & Brown, 1988), but less so when made aware of others' factors facilitating the achievement of desirable goals (Weinstein, 1980, Study 2) or statistical and methodological artifacts are controlled for (Harris, & Hahn, 2011).
Self and memory	Perceived emotion intensity	PA: event properties, personality, psychopathology	prevalence	The intensity of affect associated with negative autobiographical memories fades faster than the affect associated with positive autobiographical memories (Holmes, 1970; Walker & Skowronski, 2009). This pattern is less pronounced for recent, more self-relevant events and events with less psychological closure (Skowronski et al., 2014); it is less pronounced under mild depression (or dysphoria; Walker et al., 2003), higher anxiety, higher narcissism and other individual differences, including past-oriented individuals (Skowronski et al., 2014).
Stress and wellbeing	Predictors of stress	PA/NA: past loss experience, valenced outcome	influence	Losses of resources predict post-natal anger, but gains of resources do not, especially for those who have experienced past losses (Wells, Hobfoll, & Lavin, 1999). Conflict in intimate relationships stronger predictor of postabortion stress, whereas support in intimate relationships stronger predictor of postabortion wellbeing (Major, Zubek, Cooper, Cozzarelli, & Richards, 1997)
Risk	Information processing and decision making	PA/NA: mood arousal, personality	preference	Negative moods lead to more extensive processing in risk taking settings, but only when low-arousing (e.g., sadness); high arousing negative moods lead to more superficial processing and snap decisions on the level of risk to take (Leith & Baumeister, 1996). Majority of individuals are loss-avoiders in gambling contexts ("conservative" pattern), but a minority are gain-pursuing ("extravagance" pattern; Atthowe, 1960).
Empathy	Target of empathy	PA/NA: target	preference	Instances of positive empathy are disproportionally directed at individuals close to the target person, whereas instances of negative empathy extend broadly to people all over the world (Rozin & Royzman, 2001)

Note: PA = positive asymmetry, NA = negative asymmetry, PA/NA = positive and negative asymmetry; moderators of these asymmetries are specified after the colon sign ":". Valence asymmetry in 'prevalence' refers to uneven prevalence or representation of positive and negative items in a set domain; valence asymmetry in 'influence' refers to uneven impact on judgment and decision of positive and negative items; valence asymmetry in 'preference' refers to uneven liking and active search for positive and negative items.

Table 3. *Experimental Laboratory-based Tests of Individual-to-Group Generalization Meeting Inclusion Criteria for This Meta-Analysis*

Publication	Country	Exp.	*N*	*r*	*g*	Control	EVal	OVal	EType	DV	Time	OType / Outgroup Stereotype	OBasis	Status
Andrews et al. (under review)	NZ	1	100	.21	.44	NEC	N	U	V	P	M	E/N: Russians are neutral with negative exemplar	A	L
Bless & Schwarz (1998)	Germany	1	48	.36	.76	NEC	P	N	V	S	I	Occ: Politicians are disliked/unpopular	C	H
Bless et al. (2001)	Germany	1	54	0	0	CC	U	N	A	S	I	E/N Roma's are criminals and dirty	A	L
Bodenhausen et al. (1995)	USA	1	46	.31	.65	NEC	P	N	W	P	I	E/N: Blacks no longer affected by discrimination	A	L
Bodenhausen et al. (1995)	USA	2	63	.33	.70	NEC	P	N	W	P	I	E/N: Blacks no longer affected by discrimination	A	L
Bodenhausen et al. (1995)	USA	3	63	0	0	NEC	P	N	W	P	I	E/N: Blacks no longer affected by discrimination	A	L
Cameron & Rutland (2006)	UK	1	40	.05	.10	BLC	P	N	W	P	D	A/D: Disabled people are incompetent	A	L
Cameron & Rutland (2006)	UK	1	50	-.12	-.25	BLC	P	N	W	P	D	A/D: Disabled people are incompetent	A	L
Cameron & Rutland (2006)	UK	1	44	.52	1.23	BLC	P	N	W	P	D	A/D: Disabled people are incompetent	A	L
Cernat (2011)	Romania	1	71	.26	.54	NEC	P	N	W	S	I	E/N: Roma are criminals/dirty	A	L
Corley & Pollack (1996)	USA	2	22	.55	1.30	CC	P	N	W	P	D	Other: Lesbians' relationships are Male/Female	A	U
Dasgupta & Greenwald (2001)	USA	1	33	.41	.91	NEC	P	N	V	P	L	E/N: Blacks are unsuccessful	A	L
Dasgupta & Greenwald (2001)	USA	2	26	.44	1.01	NEC	P	N	V	P	I	A/D: Elderly are dislikeable	A	L
Desforges et al. (1997)*	USA	2	60	.24	.50	BLC	P	N	W	P	I	Other: Bikie's are dislikeable	A	L
Desforges et al. (1997)*	USA	2	74	.25	.51	BLC	P	N	W	P	I	Other: Mental patients are dislikeable	A	L
Desforges et al. (1997)*	USA	2	60	.30	.62	BLC	P	N	W	P	I	Other: Gay people are dislikeable	A	L
Desforges et al. (1997)*	USA	2	74	.23	.47	BLC	P	N	W	P	I	A/D: Drug addicts are dislikeable	A	L
Esses & Dovidio (2002)	USA	1	40	.28	.59	NEC	N	N	V	P	M	E/N: Blacks experience discrimination	A	L
Hamill et al. (1980)	USA	1	86	.61	1.52	NEC	N	N	V	S	I	Other: Welfare recipients are irresponsible	A	L
Hamill et al. (1980)	USA	2	57	.30	.63	NEC	P	N	V	S	I	Occ: Prison guards are inhumane	C	U
Henderson-King & Nisbett (1996)	USA	3	48	.48	1.09	NEC	N	N	W	S	I	E/N: Black people are aggressive	A	L
Huici et al. (1996)	Spain	1	41	.33	.70	CC	N	P	A	S	I	Occ: Teachers are responsible	C	H
Huici et al. (1996)	Spain	2	50	0	0	CC	P	N	A	S	I	Occ: Teachers are unfair	C	H
Jennings et al. (2015)	USA	1	41	.28	.58	NEC	P	U	V	S	D	Occ: Engineer's are men	C	H
Kunda & Oleson (1995)	USA	1	32	.40	.87	NEC	N	P	W	S	I	Occ: Lawyers are extroverted	C	H
Kunda & Oleson (1995)	USA	4	24	.42	.92	NEC	P	P	W	S	I	Occ: Lawyers are extroverted	C	H
Kunda & Oleson (1997)	USA	1	38	.52	1.21	NEC	N	P	W	S	I	Occ: PR agents are extroverted	C	U
Kunda & Oleson (1997)	USA	2	46	.29	.61	NEC	N	P	W	S	I	Other: Feminists are assertive	C	S
Kunda & Oleson (1997)	USA	4	24	-.52	-1.21	NEC	N	P	W	S	I	Occ: PR agents are extroverted	C	U
Kunda & Oleson (1997)	USA	4	24	0	0	NEC	N	P	W	S	I	Occ: PR agents are extroverted	C	U
Maris et al. (2016)	Belgium	1	70	.32	.68	BLC	N	P	W	S	I	Other: Novel group perceived as cold	C	U
Maris et al. (2016)	Belgium	1	70	.38	.81	BLC	N	P	W	S	I	Other: Novel group perceived as cold	C	U
Meeussen et al. (2013)	Holland	1	228	.20	.41	CC	P	P	W	P	D	Occ: Economics students are likeable	C	S
Paolini et al. (2004)	UK	1	40	.40	.88	NEC	P	N	W	D	I	Occ: Accountants are dull	C	H

Paolini et al. (2004)	UK	2	40	.40	.88	NEC	P	P	W	D	I	St: Pharmacy students are reserved	C	S
Paolini et al. (2004)	UK	2	40	.14	.28	NEC	P	P	W	D	I	St: Pharmacy students are reserved	C	S
Paolini et al. (2004)	UK	3	50	.28	.59	NEC	P	P	W	D	I	Occ: Accountants are hardworking	C	H
Penn et al. (2003)	USA	1	77	.23	.48	NEC	U	N	V	S	I	Other: Schizophrenics are dangerous	A	L
Pederson et al., (2011)	Australia	1	46	.58	1.42	BLC	U	N	V	P	D	Other: Asylum seekers are negative	A	L
Ramashramania (2015)	USA	1	88	.20	.41	CC	P	N	W	S	M	E/N: Blacks are aggressive	A	L
Seta et al. (2003)	USA	5	52	.08	.15	NEC	N	P	W	S	I	Occ:Nurses are generous	C	H
Stratton et al. (2006)	Spain	1	28	.52	1.23	NEC	P	P	W	P	I	E/N: Germans are hardworking	A	U
Stratton et al. (2006)	USA	2	19	.50	1.17	NEC	P	P	W	P	I	E/N: Germans are hardworking	A	U
Stratton et al. (2006)	USA	2	19	.37	.79	NEC	P	P	W	P	I	E/N: Germans are hardworking	A	U
Swift et al. (2013)	UK	1	43	.65	1.71	NEC	P	N	V	S	I	Other: Obese people are lazy	A	S
Tausch and Hewstone (2010)	UK	1	40	.27	.55	BLC	P	N	W	S	D	A/D: Elderly are frail and slow	A	L
Tausch and Hewstone (2010)	UK	1	40	-.08	-.17	BLC	P	N	W	S	D	A/D: Elderly are frail and slow	A	L
Vescio et al. (2003)	USA	1	64	.26	.53	CC	N	P	A	S	M	E/N: Blacks are good athletes	A	L
Virj et al. (2003)	UK	1	50	.13	.25	NEC	P	N	W	P	I	E/N: Blacks are not intelligent/academic	A	L
Wallace (2008)	USA	1	34	0	0	NEC	P	N	W	D	I	E/N: Blacks are incompetent	A	L
Wänke et al. (2003)	German	1	38	.33	.70	NEC	P	N	W	S	I	Occ: Career woman challenges feminine stereotype	A	S
Weber & Crocker (1983)*	USA	1	40	.77	2.43	NEC	P	P	W	S	I	Occ: Librarians are neat and responsible Occ: Lawyers are industrious and intelligent	C	H
Weisz and Oleson (2001)	USA	1	58	.17	.34	NEC	P	N	W	S	I	E/N: Asian Americans are unassertive	A	S
Weisz et al. (2003)	USA	1	72	.22	-.45	NEC	P	N	W	S	M	E/N: Asian Americans are unassertive	A	S
Wyer et al. (2002)	USA	1	40	.41	.90	CC	P	N	W	S	I	St: Student groups are academic	C	S
Wyer et al. (2002)	USA	1	40	.40	.88	CC	P	N	W	S	I	St: Student groups are conservative	C	S
Wyer et al. (2002)	USA	2	40	.14	.29	NEC	P	N	W	S	I	St: Student groups are academic	C	S
Wyer et al. (2002)	USA	2	40	.08	.16	NEC	P	N	W	S	I	St: Students groups depict leadership	C	S
Yzerbyt et al. (1999)	Belgium	1	27	.14	.28	NEC	P	N	A	S	I	Occ: Computer engineers are introverted	C	H

Notes: Country = participants' country; Exp. = experiment number within the publication; *N* = Number of participants; *r / g* = Hedges' *r and g* effect size for each sample; Control = type of control group (CC = confirming control condition; NEC = no experience control condition; BLC = Baseline control); EVal = experience valence (P = positive; N = negative; U = unclassified/neutral); OVal = outgroup valence (P = positive; N = negative; U = unclassified/neutral); EType = Experience type (W = written; A = audio; V = video); OBasis = Outgroup basis (A = affective-based; C = cognitive-based); DV = Type of dependent variable (S = stereotypicality; D = dispersion; P = prejudice); OType = type of outgroup (A/D = age/disability; E/N = Ethnic/national; St = student groups; Occ = occupations; Oth = other); Time = Time lapsed between experience of the outgroup member and collection of outgroup judgments (I = Immediate; M = minor delay/separate study; D = delayed); Status = status of the outgroup (L = lower than ingroup; H = higher than ingroup; S = similar to ingroup; U = unclassified). * Results collapsed across four negative outgroup.

Table 4. Summary of Predicted Individual-to-Group Generalization Effects for Impression Formation Experiments as a Function of Outgroup Valence and Experience Valence.

	Statistical Tests			
	Tests of Main Effects		Test of Interaction	Symmetry Tests
Valence Asymmetry Explanation	Outgroup Valence	Experience Valence	Outg. Valence x Exp. Valence	Contrast Neg outg-Neg exp./ Neg outg-Pos exp. studies difference vs. Pos outg-Neg Exp / Pos outg-Pos Exp studies differ.
Risk Aversion	*ns*	√ **general negative valence asymmetry**	√ **ordinal**: larger negative valence asymmetries for stigmatized-negative outgroups than positive-admired outgroups	
Epistemic Defense	*ns*	*ns*	√ **dis-ordinal**: negative valence asymmetries for stigmatized-negative outgroups and positive valence asymmetries for positive-admired outgroups	**Symmetrical:** Negative valence asymmetry for negative outgroups *same magnitude* as positive valence asymmetry for positive-admired outgroups.
Ingroup Enhancement	*ns*	√ **general negative valence asymmetry**	√ **dis-ordinal**: negative valence asymmetries for stigmatized-negative outgroups and positive valence asymmetries for positive-admired outgroups	√ **A-symmetrical:** Negative valence asymmetry for negative outgroups *larger* than positive valence asymmetry for positive-admired outgroups.

Note. Tick symbol denotes significant effect. *ns* indicates non significant effect.

Table 5. Meta-analytical Results for Moderation of Individual-to-group Generalization by Additional Design Parameters

Design parameter / Levels	*N (N%)*	*r*	*g*	*SE*	95% CI	*Fail-safe N*	Duval-Tweedie	*z*	*p*
Type of Experience									
visual	9 (15)	.37	.79	.14	.52/1.07	142	.73	5.64	<.001
audio	6 (10)	.20	.42	.17	.08/.76	13	.41	2.41	.016
written	44 (75)	.26	.54	.07	.40/.69	1640	.39	7.37	<.001
Type of Outgroup									
ethnic/national	18 (31)	.22	.45	.09	.27/.63	195	.32	4.86	<.001
age/disability	7 (12)	.19	.39	.20	-.00/.78	14	.36	1.95	.051
student groups	7 (12)	.24	.49	.10	.29/.69	40	.44	4.79	<.001
occupations	14 (24)	.27	.55	.17	.22/.89	131	.46	3.21	.001
other	13 (22)	.39	.85	.17	.62/1.08	378	.82	7.35	<.001
Basis of Outgroup									
affective	32 (54)	.28	.59	.09	.41/.77	960	.36	6.45	<.001
cognitive	23 (39)	.27	.56	.10	.36/.76	455	.54	5.52	<.001
Outgroup Status									
lower status	26 (44)	.25	.52	.08	.36/.68	601	.51	6.23	<.001

similar status	12 (20)	.26	.53	.14	.27/.80	120	.47	3.95	<.001
higher status	11 (19)	.32	.69	.03	.36/1.01	125	.62	4.11	<.001
unclassified	10 (17)	.31	.65	.20	.26/1.04	81	.48	3.28	.001
Type of DV									
stereotypicality	33 (82)	.27	.56	.10	.37/.75	957	.54	5.87	<.001
dispersion	5 (8)	.25	.52	.16	.20/.84	13	.52	3.21	.001
prejudice	21 (36)	.28	.58	.09	.42/.75	462	.41	6.86	<.001
Affective-cognitive DV									
affective	21 (36)	.28	.58	.09	.42/.75	462	.41	6.86	<.001
cognitive	38 (64)	.27	.55	.09	.39/.72	1234	.54	6.49	<.001
Type of control									
no exp. control	38 (64)	.29	.60	.09	.43/.78	1336	.57	6.96	<.001
confirming control	9 (15)	.23	.48	.11	.01/.26	69	.36	4.35	<.001
baseline w/s control	12 (20)	.26	.53	.13	.28/.77	127	.52	4.17	<.001

Time lapsed									
immediate	45 (76)	.29	.62	.07	.48/.75	2073	.60	8.72	<.001
minor/ separate study	5 (8)	.15	.31	.17	-.01/.64	7	.27	1.88	.061
delayed	9 (15)	.26	.53	.18	.17/.88	60	.46	2.90	.004
Place of research									
USA	33 (56)	.28	.58	.09	.40/.75	1001	.55	6.47	<.001
UK	11 (19)	.25	.52	.17	.19/.86	76	.49	3.07	.002
Australia/NZ	2 (3)	.40	.88	.48	-.06/1.81	**	**	1.84	.065
other Europe	13 (22)	.26	.53	.09	.35/.70	153	.43	5.87	<.001

Notes: ** Insufficient data to run publication bias tests.

Table 6a. Meta-Analytical Results for Intergroup Valence Asymmetries as a Function of Outgroup Valence and Experience Valence (No Covariates)

Design Factor/Levels	*N (N%)*	*r*	*g*	*SE*	95% CI	*Fail-safe N*	D-T	*z*	*p*
Overall	54 (100)	.28	.57	.07	.44/.70	2,687	.42	8.70	< .001
Neg-Pos outgroup diff	54 (100)	-.06	-.10	.17	-.43/.22			-.63	.527
Negative outgroup	36 (67)	.27	.54	.08	.39/.69	1,115	.40	7.05	< .001
Negative experience	3 (6)	.48	1.08	.27	.55/1.62	32	1.08	3.95	< .001
Positive experience	33 (61)	.25	.49	.07	.34/.63	753	.39	6.64	< .001
Neg-Pos exp. diff	36 (67)	.28	.60	.25	.11/1.10			2.39	.017
Positive outgroup	18 (33)	.31	.65	.13	.39/.90	322	.43	4.98	< .001
Negative experience	9 (17)	.21	.43	.18	.07/.79	33	.43	2.36	.018
Positive experience	9 (17)	.42	.88	.20	.50/1.26	135	.88	4.52	< .001
Neg-Pos exp. diff	18(33)	-.23	-.45	.27	-.97/.07			-1.69	.091
Neg-Pos experience diff	54 (100)	-.02	-.01	.18	-.38/.35			-.07	.941
Negative experience	12 (22.2)	.28	.59	.17	.26/.93	141	.43	3.47	.001
Positive experience	42 77.8)	.28	.56	.07	.42/.70	1,560	.41	7.97	< .001
Interaction Outg x Exp	54 (100)	.50	1.01	.36	.31/1.71			2.82	.005

Notes. Design factors' codes, *positive*= 0, *negative* = 1; *N* = number of tests; *N*% = percentage of the 54 included tests; Fail-safe *N* = total number of null tests needed to nullify result; Duval and Tweedie trim and fill adjusted effect size estimate; SE = standard error of *g*; 95% CI = 95% confidence interval of *g*; *Z* = standard score of *g*; *p* = probability of *g*.

Table 6b. Meta-Analytical Results for Intergroup Valence Asymmetries as a Function of Outgroup Valence and Experience Valence with Additional Design Parameters Entered as Covariates

Covariate		None			EType		OType^~		OBasis^		Status^		DV~		ACDV~		Control		Time		Place~	
	N (N%)																					
Design Factor/Levels		*g*	*z*	*P*	*g*	*p*	*g*	*p*	*g*	*p*	*g*	*p*	*g*	*p*	*g*	*p*	*G*	*p*	*g*	*p*	*g*	*p*
Overall	54 (100)	.57	8.70	< .001																		
Neg-Pos outgroup diff	54(100)	-.10	-.63	.527	-.17	.301	-.14	.443	-.14	.455	-.04	.831	-.13	.454	-.11	.521	-.08	.634	-.07	.671	-.11	.520
Negative outgroup	36 (67)	.54	7.05	< .001																		
Negative experience	3 (6)	1.08	3.95	< .001																		
Positive experience	33 (61)	.49	6.64	< .001																		
Neg-Pos exp. diff	36 (67)	.60	2.39	.017	.60	.024	.61	.015	.64	.016	.67	.012	.60	.023	.60	.019	.60	.026	.70	.004	.60	.025
Positive outgroup	18 (33)	.65	4.98	< .001																		
Negative experience	9 (17)	.43	2.36	.018																		
Positive experience	9 (17)	.88	4.52	< .001																		
Neg-Pos exp. diff	18(33)	-.45	-1.69	.091	-.45	.083	-.73	.032	-.43	.114	-.55	.073	-1.21	.007	-.52	.111	-.50	.103	-.56	.065	-.71	.050
Neg-Pos experience diff	54 (100)	-.01	-.07	.941	-.04	.830	-.08	.685	-.03	.891	-.02	.925	-.05	.828	-.01	.962	-.03	.890	-.07	.671	-.04	.838
Negative experience	12 (22.2)	.59	3.47	.001																		
Positive experience	42 77.8)	.56	7.97	< .001																		
Interaction Outg x Exp	54 (100)	1.01	2.82	.005	.94	.009	1.13	.002	1.02	.007	1.09	.003	1.14	.003	1.02	.005	1.00	.008	1.05	.002	1.03	.005

Notes. Design factors' codes, 0 = *positive*, 1 = *negative*. ^ identifies design parameters displaying some degree of covariation with outgroup valence and warranting control in tests of outgroup valence. ~ identifies design parameters displaying some degree of covariation with experience valence and warranting control in tests of experience valence. *N* = number of tests; *N*% = percentage of the 54 included tests. EType = type of experience. OType = Type of Outgroup. OBasis = basis of outgroup. Status = outgroup status. DV = type of DV. ACDV = affective-cognitive DV. Control = type of control. Time = time lapsed. Place = place of research.

Table 7a. Tests of Co-Variation Between Outgroup Valence and Additional Design Parameters

Design Factor	*Outgroup Valence*					
Design parameter / Levels	*Positive* *N/%*	*Negative* *N/%*	*Total* *N/%*	χ^2	*df*	Exact *p*
Type of Experience				2.78	2	.311
visual	0/0%	7/100%	7/100%			
audio	2/33.3%	4/66.6%	6/100%			
written	16/36.4%	28/63.6%	44/100%			
Type of Outgroup				8.82	4	.063
ethnic/national	4/25.0%	12/75.0%	16/100%			
aging/disability	0/0%	6/100%	6/100%			
student groups	3/42.9%	4/57.1%	7/100%			
occupations	8/61.5%	5/38.5%	13/100%			
other	3/25.0%	9/75.6%	12/100%			
Basis of Outgroup				8.24	2	.017
affective	6/21.4%	22/78.6%	28/100%			
cognitive	12/54.5%	10/45.5%	22/100%			
other	0/0%	4/100%	4/100%			
Outgroup Status				17.46	3	<.001
Lower status	1/4.5%	21/95.5%	22/100%			
Similar status	4/33.3%	8/66.7%	12/100%			
Higher status	6/60.0%	4/40%	10/100%			
unclassified	7/70%	3/30%	10/100%			

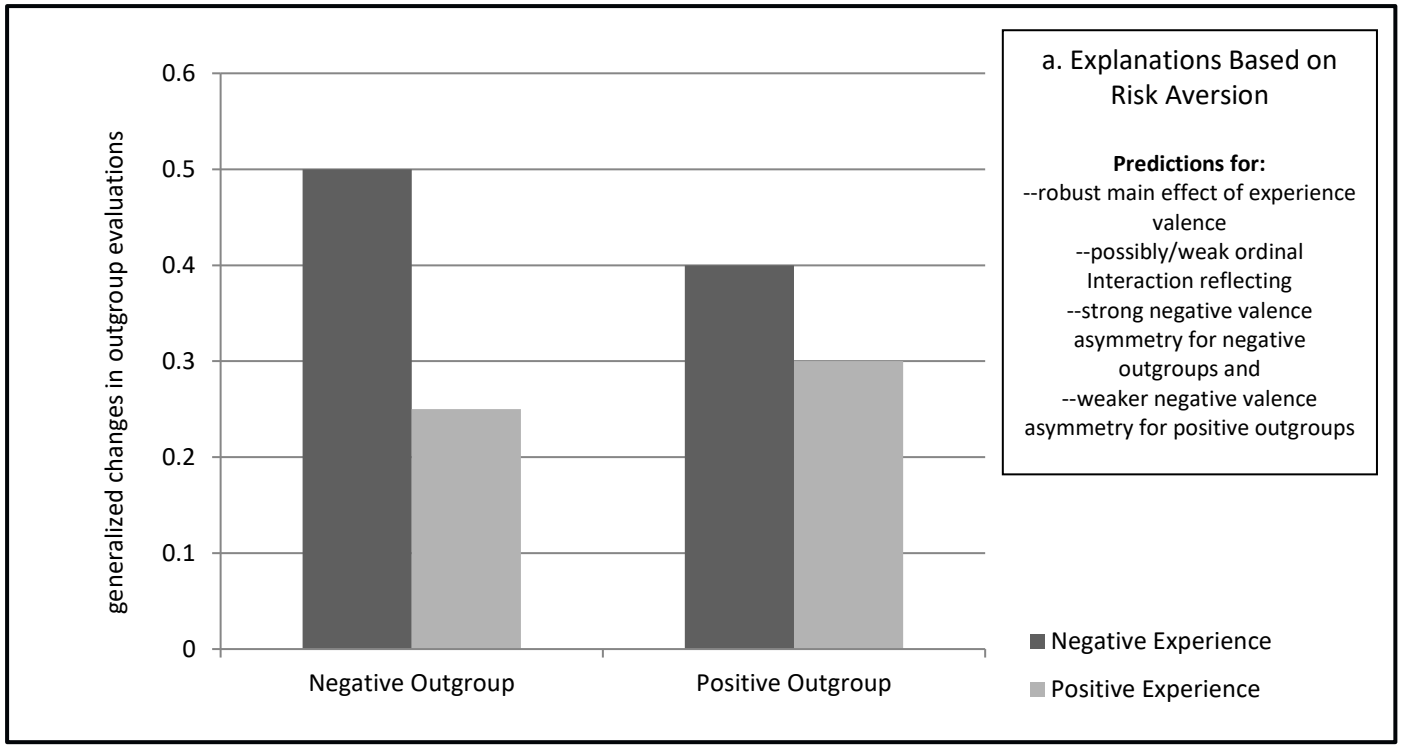
Type of DV				3.04	2	.271
stereotypicality	11/36.7%	19/63.3%	30/100%			
dispersion	3/60%	2/40%	5/100%			
prejudice	4/21.1%	15/78.9%	19/100%			
Affect-Cogn DV				1.99	1	.229
affective	4/21.1%	15/78.9%	19/100%			
cognitive	14/40%	21/60%	35/100%			
Type of Control				3.67	2	.159
no exp control	14/40%	21/60%	35/100%			
confirming control	3/37.5%	5/62.5%	8/100%			
baseline w/s control	1/9.1%	10/90.9%	11/100%			
Time Lapsed				1.56	2	.574
Immediate	16/37.5%	27/62.8%	43/100%			
minor/separate study	1/25%	3/75%	4/100%			
delayed	1/14	6/85.7%	7/100%			
Place of Research				1.94	2	.422
USA	9/29%	22/71%	31/100%			
UK	3/27	8/72.7	11/1			
Other Europe	6/50%	6/50%	12/100%			

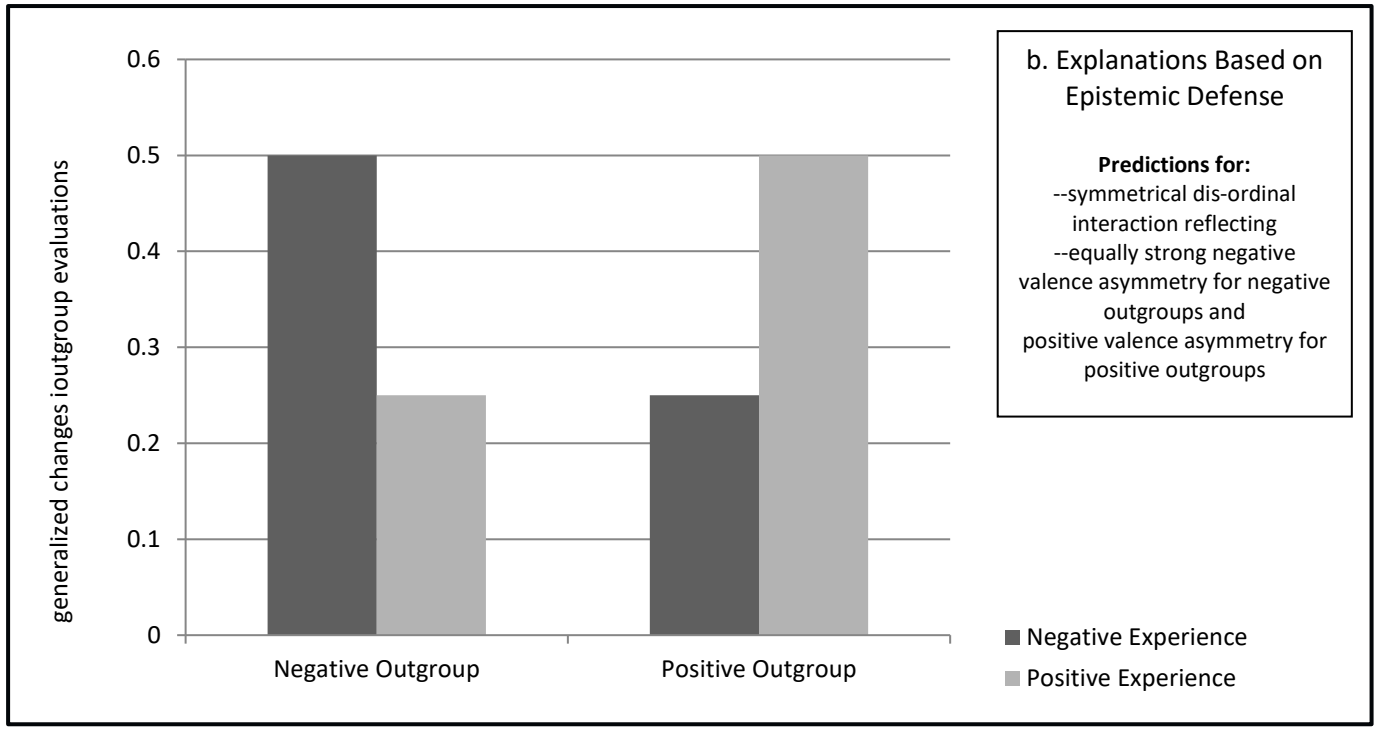
Table 7b. Tests of Co-Variation Between Experience Valence and Additional Design Parameters

Design Factor	Exemplar Valence					
Design parameter / Levels	*Positive* *N/%*	*Negative* *N/%*	*Total* *N/%*	χ^2	*df*	Exact *p*
Type of Experience				4.56	2	.131
visual	4/80.0	1/20.0	5/100%			
audio	2/40%	3/60%	5/100%			
written	36/81.8%	8/18.2%	44/100%			
Type of Outgroup				8.19	4	.082
ethnic/national	13/81.3%	3/18.8%	16/100%			
aging/disability	6/100%	0/0%	6/100%			
student groups	7/100%	0/0%	7/100%			
occupations	7.53/8%	6/46/2%	13/100%			
other	9/75%	3/25%	12/100%			
Basis of Outgroup				2.62	2	.269
affective	23/82.1%	5/17.9%	28/100%			
cognitive	15/68.2%	7/31.8%	22/100%			
unclassified	4/100%	0/0%	4/100%			
Outgroup Status				3.73	3	.332
lower status	18/81.8%	4/18.2%	22/100%			
similar status	11/91.7%	1/8/3%	12/100%			
higher status	7/70.0%	3/30%	10/100%			

unclassified	6/60%	4/40%	10/100%			
Type of DV				8.21	2	.016
stereotypicality	19/63.3%	11/36.7%	30/100%			
dispersion	5/100%	0/0%	5/100%			
prejudice	18/94.7%	1/5.3%	19/100%			
Affect-Cogn DV				4.88	1	.039
affective	18/94.7%	1/5.3%	19/100%			
cognitive	24/68.6%	11/31.4%	35/100%			
Type of Control				1.38	2	.562
no exp control	26/74.3%	9/25.7%	35/100%			
confirming control	6/75.0%	2/25.0%	8/100%			
baseline w/s control	10/90.9%	1/9.1%	11/100%			
Time Lapse				3.81	2	.164
Immediate	33/76.7%	10/23.3%	43/100%			
minor /separatestudy	2/50%	2/50%	4/100%			
delayed	7/100%	0/0%	7/100%			
Place of Research				5.16	2	.064
USA	21/67.7%	10/32.3%	31/100%			
UK	11/100%	0/0%	11/100%			
Other Europe	10/83.3%	2/16.7%	12/100%			

Figures


generalized changes in outgroup evaluations
0.6
0.5
0.4
0.3
0.2
0.1
0
Negative Outgroup
Positive Outgroup
Negative Experience
Positive Experience
a. Explanations Based on Risk Aversion
Predictions for:
--robust main effect of experience valence
--possibly/weak ordinal Interaction reflecting
--strong negative valence asymmetry for negative outgroups and
--weaker negative valence asymmetry for positive outgroups


0.6
0.5
0.4
0.3
0.2
0.1
0
generalized changes ioutgroup evaluations
Negative Outgroup
Positive Outgroup
b. Explanations Based on Epistemic Defense
Predictions for:
--symmetrical dis-ordinal interaction reflecting
--equally strong negative valence asymmetry for negative outgroups and
positive valence asymmetry for positive outgroups
Negative Experience
Positive Experience

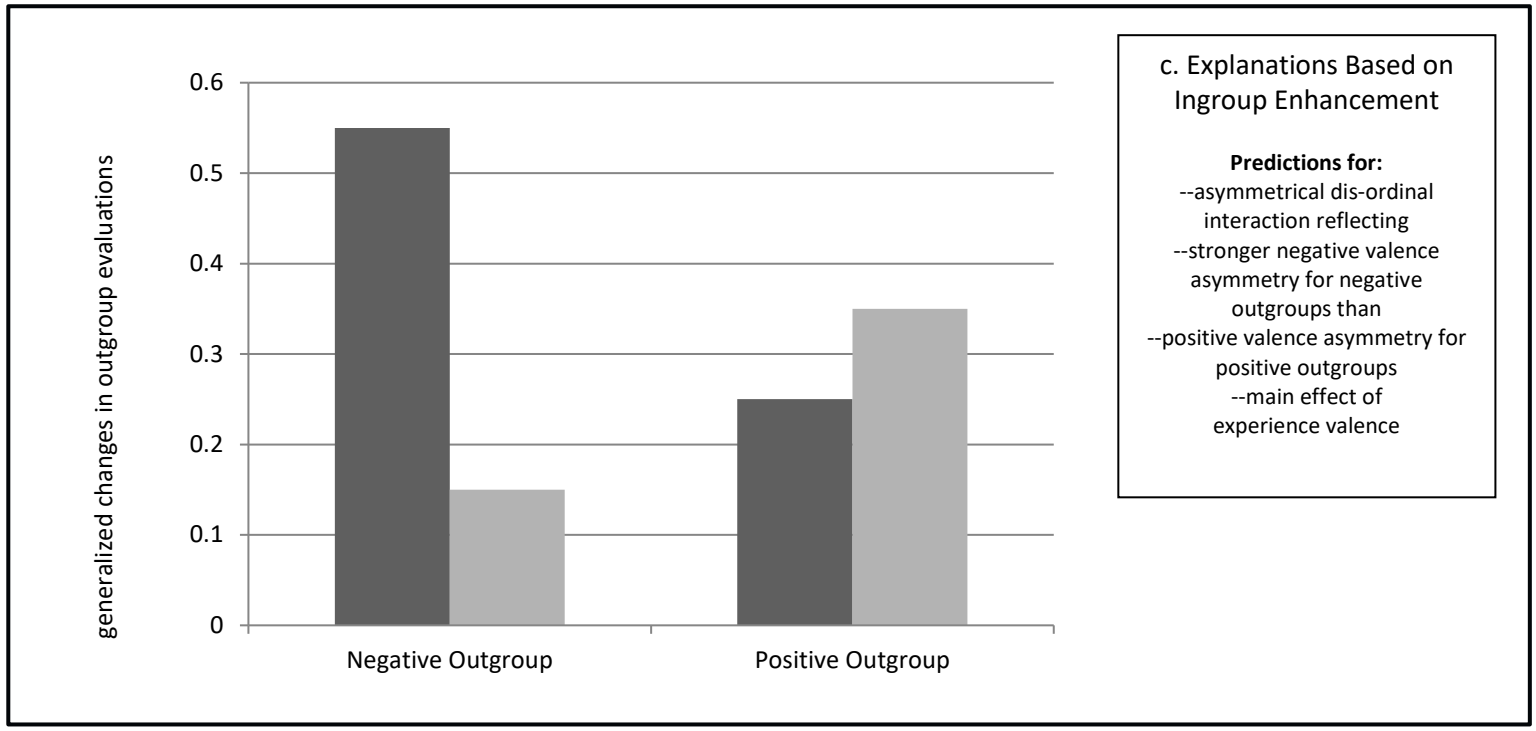


Figure 1. Pattern of *predicted* generalized changes in outgroup evaluations of negative and positive outgroups, after novel negative or positive experiences with outgroup members, according to accounts with a focus on risk aversion (pane a.), epistemic defense (pane b.), and ingroup enhancement (pane c.). Zero on the y-axis indicates baseline outgroup evaluations prior to or without novel experience; the higher the values the larger the absolute change in outgroup evaluations after novel experience in the direction of the novel experience. Risk aversion explanations predict a main effect of experience valence and a (weak) ordinal outgroup valence by experience valence interaction. Epistemic defense explanations predict a symmetrical, dis-ordinal outgroup valence by experience valence interaction. Ingroup enhancement explanations predict a main effect of experience valence and an asymmetrical dis-ordinal outgroup valence by experience valence interaction.

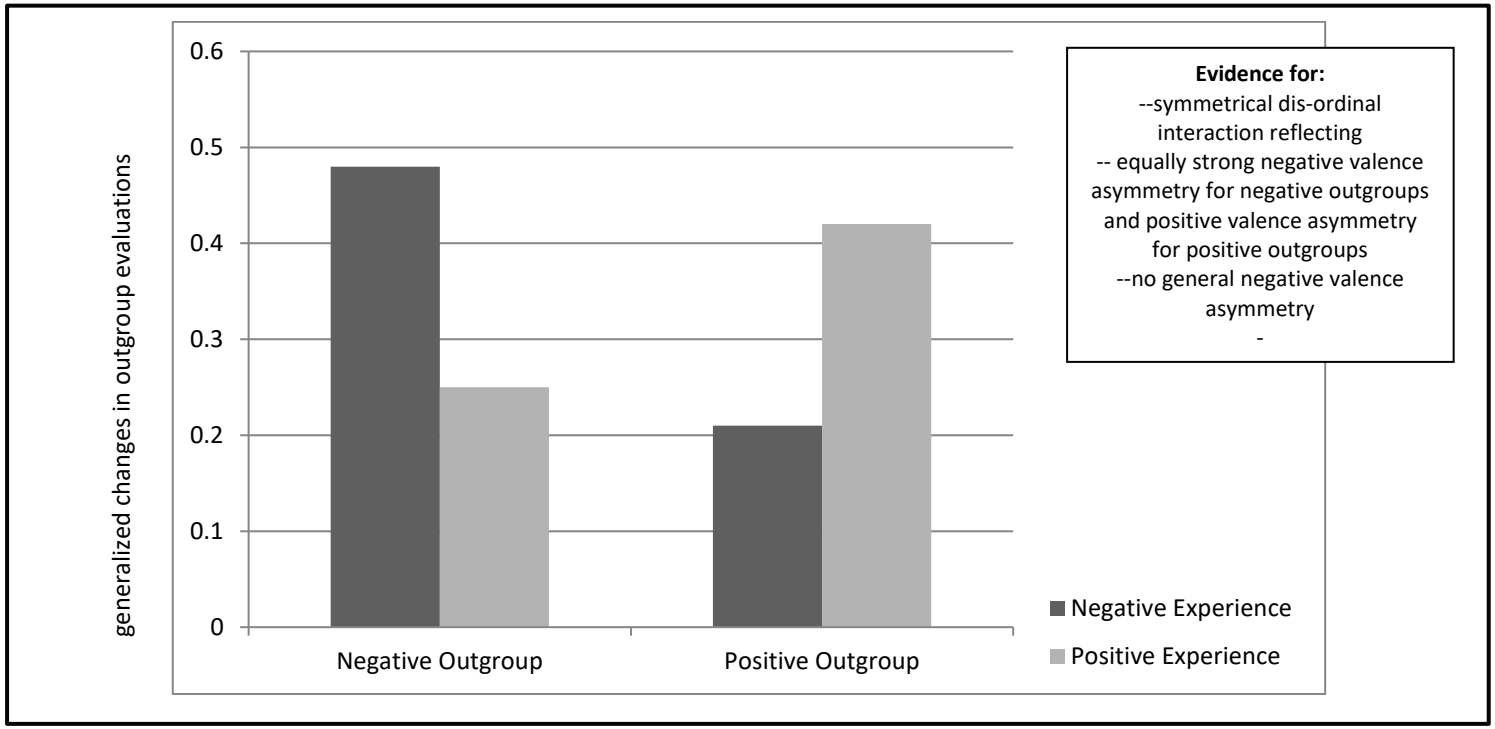


Figure 2. Pattern of *obtained* meta-analytical generalized changes in outgroup evaluations of negative and positive outgroups, after novel negative or positive experiences with outgroup members most consistent with epistemic defense explanations and least consistent with risk aversion. Effects are expressed as Hedges and Olkin's *r*s (standardized; range -1/+1) and indicate changes in outgroup evaluations in the direction of the novel outgroup experience as compared to control (value of 0 on the y-axis) prior to or without novel experience.