

Strategic Regulation of Empathy
Erika Weisz & Mina Cikara

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Authors' Affiliations:

Department of Psychology

Harvard University

Cambridge, MA 02143

Correspondence: eweisz@fas.harvard.edu (E. Weisz)

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Abstract

Empathy is an integral part of socio-emotional well-being, yet recent research has highlighted some of its downsides. Here we examine literature that establishes when, how much, and what aspects of empathy promote specific outcomes. After reviewing a theoretical framework which characterizes empathy as a suite of separable components, we examine evidence showing how dissociations of these components affect important socio-emotional outcomes and describe emerging evidence suggesting that these components can be independently and deliberately regulated. Finally, we advocate for an approach to a multi-component view of empathy which accounts for the interrelations among components. This perspective advances scientific conceptualization of empathy and offers suggestions for tailoring empathy to help people realize their social, emotional, and occupational goals.

Empathy: When, How Much, and Which Components?

One of our species' greatest assets is the imperative to connect with others, exercised regularly through our capacity for empathy. Empathy—the ability for one person (a perceiver) to share and understand the internal states of someone else (a target) impels us to care for our young, to cultivate and transmit knowledge, and to coordinate collective action toward shared goals [1]. Given its fundamental role in social functioning, it is no surprise that empathy is associated with adaptive outcomes such as increased emotional well-being [2], greater social connectedness [3,4], and better health [5]. Empathy also facilitates helping behavior, cooperation, and altruism [6,7].

Based on these findings, one might think society would be best served by increasing empathy across all individuals and contexts, but the available evidence paints a much more complicated picture. For example, some forms of empathy appear to increase risk for experiencing occupational exhaustion among clinicians [8,9]. Empathy for one's own group can exacerbate rather than mitigate hostility toward other groups [10]. And though empathy can motivate people to help others, it can paradoxically reduce the impact of aid by narrowing the focus of helpers' concern to proximal recipients instead of distal and needier ones [11]. Such findings have sparked recent debates challenging empathy's utility: are the benefits of empathy really worth the costs?

In this article, we discuss how—rather than undermining empathy's utility—evidence demonstrating its potential costs highlights the urgent need for a more nuanced approach to evaluating empathy and its outcomes. Here we aim to shift the debate from questions of empathy's virtue—whether it is helpful or harmful—to what could be a more productive inquiry: when, how much, and which components of empathy move us toward important goals (such as

increased well-being and relationship satisfaction) and away from undesired outcomes (such as burnout and discrimination)? After briefly establishing the separability of three empathy-related components (experience sharing, perspective-taking, and empathic concern), we review findings from four domains that have received considerable empirical attention—helping behavior, occupational burnout, relationship quality, and negotiation—to illustrate how specific components (rather than empathy as a whole) track important outcomes. We also evaluate research demonstrating how targeted regulation can change the extent to which people engage specific components of empathy and describe the socio-emotional benefits such interventions can produce. Finally, we explore the spontaneous co-activation of these components in an effort to characterize how they actually operate in the real world and advocate for a new approach to a multi-component view of empathy which accounts for the interrelations among components.

The Empathy Umbrella: Three Related but Distinct Components

Empathy is a multi-componential phenomenon, involving processes that allow people to share, understand, and respond to others' emotions. Although researchers do not always agree on the exact definition of empathy [12,13], many contend that it involves at least three components. First, empathy requires an affective component, known sometimes as affective empathy, emotion contagion, or experience sharing, whereby people vicariously feel others' emotional states. Second, empathy involves a cognitive component, known as theory of mind, mentalizing, cognitive empathy, or perspective-taking, whereby people consider others' thoughts and experiences. Finally, empathy involves a motivational component, which has been called compassion, prosocial concern, or empathic concern, which refers to the desire to promote others' well-being or alleviate their suffering [14–16].

If asked to recall a recent experience with empathy, many would report instances where they engaged all three components simultaneously. Consider a parent consoling their child after she got in a fight with a friend. The parent likely shares their child's pain, understands her distress, and feels motivated to help cheer her up. But the same parent's empathic response would likely be different if instead their child were upset because she couldn't have a second bowl of ice cream. The parent would understand why their child was distressed, and the parent would still want to cheer her up. But the parent likely would not share in their child's pain to the same extent in this latter scenario as they would have in the former.

That a parent can have different empathic responses to their child depending on circumstance illustrates the inherent flexibility of empathy. Empathy is context-dependent [17] and sensitive to motivations and goals [18–20]. Consequently, it shifts across situations and can deliberately be changed through experimental manipulations and psychological interventions [21,22]. Although experience sharing, perspective-taking and empathic concern can and often do occur together, they appear somewhat dissociable. Many of the most frequently-used empathy inventories find evidence for separability among empathy-related components. For example, factor analyses of items included in the Interpersonal Reactivity Index—a commonly used self-report measure of empathy—suggest constructs like empathic concern and perspective-taking are distinct from one another [23]. Similarly, recent work has evaluated latent structures of another popular empathy scale, the Jefferson Scale of Empathy [24]. These efforts have revealed a three-factor structure consisting of walking in a patient's shoes, perspective-taking, and compassionate care, a structure bearing resemblance to that of experience sharing, perspective-taking and empathic concern. Supporting this observation, several studies find that experience sharing,

perspective-taking and empathic concern engage different neural substrates [25–30], see **Figure 1A**. And critically, the dissociation of these components yield distinct socio-emotional outcomes.

Empathy in Context: Different Situations Require Different Components

A considerable portion of research on empathy-related outcomes investigates empathy as a whole. However, there are at least four domains where researchers have examined how individual components of empathy—rather than empathy as a whole—yield different outcomes. These domains include helping, occupational burnout, relationship satisfaction, and negotiation. In this section, we briefly examine how contributions of experience sharing, perspective-taking and empathic concern can differentially affect outcomes in these four domains (see **Table 1** and **Table S1** for additional study descriptions). Although much of this work is based on individual difference measures, we endeavor to highlight cases where specific constructs are manipulated.

Helping Behavior

Decades of research demonstrate an association between empathy and helping behavior [31,32]. Empathy facilitates cooperation and coordinated action between parties [33,34] and predicts costly helping, even between strangers [7,35]. However, empathy can also inhibit helping behavior by constraining the scope of need to which perceivers are sensitive [36] and can even exacerbate existing problems in intergroup relations by driving discrimination [10] and polarization [37]. Given these complexities, it may therefore be more fruitful to examine which empathy-related components facilitate or inhibit helping, rather than considering the relationship between helping and empathy as a whole.

Generally speaking, empathic concern appears to be a highly reliable predictor of helping [38–41]. For example, trait empathic concern predicts generosity of contributions to public goods in economic games [42]. Trait empathic concern is also associated with one’s willingness to provide costly help to a stranger [7].

Experimentally-induced perspective-taking has also been linked to helping behavior [43–45], although it seems to show greater sensitivity to context (whereas empathic concern may be more robust). For example, a recent meta-analysis examined supportive expressions between colleagues, and found that although perspective-taking and empathic concern both predicted supporting one’s coworkers, empathic concern was a stronger predictor than perspective-taking. What’s more, empathic concern facilitated bidirectional benefits between coworkers irrespective of their power (e.g., a supervisor and their employee), unlike perspective-taking which was most beneficial when the perceiver had more power than the target [46]. Finally, some evidence suggests that the kind of perspective-taking in which one engages (imagining how another person feels versus imagining how you would feel in their position) affects important motivational precursors to helping [43]. It is possible that outcomes of perspective-taking depend on whether adopting another’s perspective makes an individual feel threatened [47,48], though more research is needed to decisively address this hypothesis.

Experience sharing also has a somewhat inconsistent relationship with helping (though see **Box 1**). Vicariously feeling someone else’s emotions sometimes can serve as a catalyst for prosocial behavior [35,49]. But experiencing others’ pain can also induce personal distress, a self-oriented feeling that motivates perceivers to attend to and alleviate their own suffering instead of a target’s suffering [50,51]. Personal distress can drive perceivers to avoid targets’ suffering, precluding opportunities for helping altogether [52,53].

Some have speculated that there may be a ‘Goldilocks’ level of distress in response to suffering [54], such that too little might render apathy where as too much creates avoidance. It is also possible that individual differences (such as one’s perceived ability to help) or features of context (such as one’s familiarity with the environment) moderate this relationship [55,56]. Recent research has identified yet another moderator of the relationship between experience sharing and helping: emotion regulation, or the ability to exercise willful control over one’s own emotional reactivity [57]. People who are better able to regulate their emotions may be less vulnerable to personal distress and its negative consequences when vicariously experiencing others’ emotions [58,59]. As such, experience sharing may not be so detrimental for these individuals, although additional research is needed to address this question.

Occupational Burnout

Professional caregiving relationships—such as that between a doctor and patient, or between a social worker and a client—have been of great interest to empathy researchers because this is an area in which contradictory findings abound. Although patients reliably benefit from having highly empathic doctors [60,61], it is not clear whether doctors benefit from having high levels of empathy for their patients. Some studies demonstrate a negative association between empathy and burnout among healthcare professionals [62], yet other research demonstrates the opposite: rather than buffering against burnout, empathy may actually increase it [8,9,63]. In caregiving occupations, it is possible that the magnitude of suffering overwhelms practitioners, and that down-regulating empathy is an effort to protect against burning out [64]. Supporting this idea, many studies demonstrate that empathy declines during medical training [65,66].

Research among caregiving professionals often examines empathy as a monolith: collapsing across experience sharing, perspective-taking and empathic concern in medicine,

therapy, and social work. However, recent discourse emphasizes the importance of disambiguating components of empathy in clinical contexts [67–69], and a growing body of research examines how specific components of empathy predict burnout. Although this literature is somewhat small, conclusions appear fairly consistent across studies. For instance, multiple studies find that experience sharing—particularly when it elicits personal distress—may increase risk for burnout [70–72]. Conversely, empathic concern is associated with reduced risk of burnout for both for practitioners and medical students [9,72,73]. Perspective-taking also appears to be negatively associated with burnout [71,72]. More research is needed to establish the reliability of these findings, though these studies provide a promising start to this inquiry.

Relationship Quality

Recent findings suggest that empathy components track important relationship outcomes across the lifespan. Children of parents who score higher on measures of global empathy have better emotion regulation skills than children of parents who score lower. They also show lower rates of systemic inflammation, suggesting that empathy in the parent-child relationship confers measurable psychological and physiological benefits to children [74]. In adulthood, global empathy is associated with satisfaction in romantic relationships [75]. Unfortunately, the relational benefits of empathy are not universal and are sensitive to context. Among parents for example, high levels of trait empathy are associated with greater psychological well-being, but also with high levels of chronic inflammation [74]. By looking at individual components of empathy (rather than empathy as a whole), researchers may be better positioned to understand how empathy can support relationships without incurring personal or relational costs.

As is the case in research on helping and occupational burnout, trait empathic concern is often associated with positive outcomes in relationships. Empathic concern tracks the ability to

forge and nurture friendships [3]. People who score higher on measures of empathic concern have larger networks of friends and maintain more close relationships than those scoring lower [4]. They also occupy more central positions and are more valued within these networks [3,76].

Perspective-taking also carries benefits in close relationships. It is positively associated with efforts to reconcile (rather than retaliate) during conflict [77] and is a necessary component of empathic accuracy (the ability to accurately infer others emotions), which tracks satisfaction in romantic relationships [75]. However, relational outcomes of perspective-taking appear more context-sensitive than outcomes of empathic concern. For instance, if one's romantic partner is entertaining thoughts or feelings which, if inferred accurately, could threaten the relationship (e.g., "we should break up"), perspective-taking may not be beneficial [78].

Experience sharing is an important predictor of outcomes in close relationships, but again, depends on when and how it is engaged. Sharing a partner's emotional states tracks satisfaction in romantic relationships [79,80]. However, romantic partners whose moods and cortisol levels are tightly correlated report greater marital dissatisfaction, perhaps due to difficulty disengaging with each others' negative moods [81,82]. Experience sharing exhibits conditional utility in the parent-child relationship as well. Although sharing affect can help a parent attend to their child's needs, matching a child's affect exactly (e.g., distress in response to a child's distress) can lead to worse outcomes for the child including difficulty with social adjustment and regulatory control [83] and manifest in symptoms of depression and anxiety [84].

Negotiation

Unlike helping behavior, relationship quality, and occupational burnout, the association between empathy and negotiation presents an interesting problem, because the goals of one party are often not aligned or may even be antithetical to the goals of another. However, similar to the

previous examples described in this section, sensitivity to context and underlying motivations of both perceiver and target can help provide insight into which empathy-related components might improve outcomes during negotiation.

Taking the perspective of the opposing party is often strategically beneficial in negotiation. Supporting this idea, one experiment found that perspective-taking—whether measured or manipulated—improved participants’ ability to create and claim resources during a hypothetical negotiation over the sale of gas in which the buyer’s reservation price (the maximum she was authorized to pay) was lower than the seller’s reservation price (the minimum she was willing to accept). Empathic concern, on the other hand, actually undermined success in this negotiation, marking a case in which empathic concern is counter-productive [85]. But there are many ways to negotiate, and it is possible that empathic concern may have its utility elsewhere in negotiation. For example, another experiment found that measures and manipulations of empathic concern—not perspective-taking—tracked success in strategic interactions that required relationship formation (such as building coalitions or alliances) [86].

Implementing Strategic Regulation

The studies reviewed thus far have established that experience sharing, perspective-taking, and empathic concern have unique predictive power for important behavioral outcomes in specific relational contexts. Although people differ in their tendencies to engage specific components of empathy, these tendencies can be overridden as illustrated in some of the experiments referenced above. This observation introduces an exciting possibility: could individuals willfully exert control over specific components of empathy in service of their social, emotional and occupational goals (see Figure 1B)? And if so, would such deliberate regulation of

empathy impart lasting changes in people's social and emotional lives in the real world?

Findings from two literatures—meditation and emotion regulation—suggest that the answer could be yes.

Meditation

Meditation practices—including but not limited to mindfulness meditation and loving-kindness meditation—are often used to change experiences of empathy [54,87]. Recent evidence suggests that targeted meditation exercises could be used to increase specific components of empathy rather than changing empathy as a whole. Loving-kindness meditation practiced over three months affects experiences of empathic concern and even increases cortical volume in brain regions associated with empathic concern. Conversely, meditation exercises based in thought observation (also practiced over three months) improves performance on perspective-taking tasks and increases cortical volume in brain regions known to support perspective-taking [88,89]. Shorter-term meditation can also affect empathy-related components. One experiment found that a minutes-long mindfulness meditation fostered empathic concern and increased helping behavior toward an ostracized stranger [41].

While meditation appears to be a potential lever by which to change empathy-related components, we would be remiss if we did not also highlight contrary evidence. A recent meta-analysis indicates that outcomes of meditation studies may be qualified by aspects of research design, such as the operationalization of prosociality or whether the meditation teacher was a co-author in the published study [90]. Future research will need to resolve these challenges and determine the extent to which benefits reflect methodological features of an experiment. Additionally, future research should examine whether the benefits of meditation on empathy-

related outcomes are “dose dependent”, such that more training creates proportionately greater benefits (see Outstanding Questions).

Emotion Regulation

Emotion regulation also plays an important role in determining key outcomes related to empathy, particularly those that relate to experience sharing. For instance, experience sharing may not be detrimental in caregiving-related occupational settings so long as individuals can regulate their emotions. In line with this prediction, among social workers emotion regulation was negatively associated with occupational burnout, perhaps due to an improved sense of efficacy [91]. Whereas unbridled experience sharing might be a liability in this context, the capacity to feel with a patient while also regulating one’s vicarious emotions could be an asset.

Emotion regulation skills appear relevant to other outcomes, including relational outcomes [84,92] and helping. Vicarious responses to others’ suffering can be overwhelming among individuals who have low regulatory control over their emotions. This experience can culminate in high rates of personal distress, which can motivate people to attend to their own vicarious pain rather than alleviate a target’s suffering. Conversely, individuals who are better able to regulate their emotions experience less personal distress and may therefore be more inclined to help targets in need [93–95].

These observations have led researchers to leverage emotion regulation strategies to affect specific components of empathy and drive particular outcomes. For instance, engaging in suppression—but not reappraisal—decreases the amount of empathic concern perceivers experience for needy targets, and also reduces their willingness to engage in altruistic behavior [58]. And specifically, emotion reappraisals that encourage people to reflect on how they could help others reduced negative and increase positive affect in empathic responding. This in turn

was associated with increased altruistic behavior [96]. Determining which regulatory strategies reliably predict specific outcomes is an exciting avenue for future research.

Further Considerations

Though experiments in meditation and emotion regulation stem from somewhat disparate literatures, it is worth mentioning that they appear similar to each other another in practice and may rely on similar mechanisms. For example, emotion regulation has been identified as a “core component” of mindfulness meditation which could underlie many of the benefits of this practice [97]. Other work categorizes mindfulness as a specific emotion regulation strategy [98]. Thus these literatures may be targeting similar mechanisms [99], however the exact extent or nature of their similarity remains an open question.

Finally, before deliberately increasing the experience of a particular empathy-related component with strategies from the meditation or emotion regulation literatures, it is important to thoroughly characterize the extent to which individuals spontaneously engage components at baseline. For example, a recent study [100] suggests that empathic concern may be the default response to others’ suffering, rather than the product of an experimental manipulation. Classic perspective-taking experiments demonstrate that participants instructed to take the perspective of a suffering target report greater empathic concern for them than participants instructed to remain objective [31]. However, it appears that this difference is driven by a suppression of empathic concern among participants asked to remain objective (i.e., those in the control condition), rather than an increase in empathic concern among participants asked to take the target’s perspective [100]. Such findings remind researchers that it is of critical importance to first characterize the extent to which individuals spontaneously engage different components across contexts, and only

then make adjustments. Equipped with this information, researchers would be well positioned to target specific components through training or intervention.

Understanding Spontaneous Co-activation of Components

The previous sections have established that empathy-related components can dissociate, and presented evidence suggesting that they can be differentially affected by interventions that leverage mindfulness and emotion regulation. However, one remaining question at the heart of strategic regulation efforts relates to the dissociability of these components in the real world. Evidence examining the interrelations of these components suggests that while they can be separated, they actually co-occur quite often in more ecologically valid tasks and settings. To advance inquiry surrounding how specific components of empathy can be regulated to promote certain goals, researchers first must characterize how components co-occur or separate on their own. In this section, we therefore review the growing body of evidence examining the spontaneous co-occurrences of empathy-related components and their behavioral consequences.

As mentioned previously, inventories such as the Interpersonal Reactivity Index and Jefferson Scale of Empathy show conceptual independence of empathy-related components. However, actual experiences of empathy-related components as captured by self-report are not independent of one another. Empathic concern and perspective-taking are correlated with each other in analyses of the Interpersonal Reactivity Index (Pearson's r values between .30 and .38 across samples [101]). Similarly, factors comprising the Jefferson Scale of Empathy also appear to be correlated with one another [24].

These findings reinforce that idea that components, while separable, may often be co-activated. As such, examining interactions of these components may provide important insight

into how empathy can be regulated strategically. For example, one study found that the interaction of self-reported empathic concern and self-reported perspective-taking predicted occupational burnout, suggesting that perspective-taking decreases burnout specifically when respondents are also experiencing empathic concern [71]. Another recent study demonstrated that a perspective-taking manipulation increased both empathic concern for a target and willingness to behave altruistically for their benefit [102].

Component interrelation is also reflected in brain activity. Several studies suggest the presence of an interaction between “bottom-up”, reflexive aspects of empathy (such as experience sharing) and “top-down”, deliberative aspects of empathy (such as perspective-taking, [103]. For example, inferring whether or not a target is in pain can activate brain regions associated with both experience sharing and perspective-taking [104]. Similarly, processing complex social interactions and moral reasoning involves the simultaneous activation of neural substrates that support both experience sharing and perspective-taking [105–108].

These and other studies have lead researchers to speculate that socio-emotional functioning relies not just on the recruitment of non-overlapping networks, but also on their interactions with one another [109]. Though few in number, studies explicitly examining interactive effects among components show that their co-occurrence can have unique predictive power for behavior beyond that contributed by separate components alone. For instance, empathic accuracy—which is thought to involve both experience sharing and perspective-taking [107]—facilitates responsiveness between romantic partners. However, this effect is moderated by empathic concern. Empathic accuracy increased responsiveness among individuals reporting high levels of empathic concern, but had the opposite effect for those reporting low levels of empathic concern, decreasing their responsiveness [110]. Because

experience sharing and perspective-taking support empathic accuracy, these findings could be interpreted to suggest that experience sharing, perspective-taking, and empathic concern interact to facilitate complex social inferences and subsequent responding. Intriguingly, recent work finds that individuals exhibiting atrophy in brain regions associated with experience sharing (e.g., right insula) performed worse on an empathic accuracy task as compared to healthy controls [111]. Thus, it is possible that components such as experience sharing and perspective-taking interact to help people accurately infer others' emotions in highly naturalistic paradigms, and perhaps both experience sharing and perspective-taking are required to support complex socio-emotional inferences. This insight is highly relevant to strategic empathy regulation efforts, because addressing components in isolation through meditation or emotion-regulation based strategies may not produce the desired effect when outcomes rely on the interaction of components.

In light of the evidence we've just reviewed, ongoing efforts to alter experiences of empathy components through meditation or emotion regulation exercises must account for the fact that these components tend to track with one another and perhaps even depend on each other. In some instances it may be more productive to train multiple components at once (for example, empathic concern and perspective-taking) in pursuit of specific outcomes.

These studies also highlight many questions about what benefits or drawbacks are created when components occur in isolation or simultaneously. For example, they raise important questions about the structural and temporal relationship of these components to one another. Answering these questions represents a critical step toward understanding how empathy can be regulated in service of specific goals. For example, some research suggests that perspective-taking alone is not enough to elicit prosocial behavior; rather, perspective-taking affects helping

through shared emotion [31]. As such, it may be particularly fruitful for researchers to test competing structural models that assume different functional relations among the three components (see **Box 2**).

Concluding Remarks

Early research on empathy regarded it as a monolithic construct. This characterization ultimately gave rise to a second wave of empathy-related research, which explicitly examined dissociations among empathy-related components. Subsequently, researchers noticed that individual components held different predictive power over key outcomes such as helping and occupational burnout. As described above, however, there are many instances in which these components track together in the real world, suggesting that although they can dissociate, they often operate in tandem.

Because empathy-related components rely on separable neural systems, the field of social neuroscience has already made significant progress toward the goal of characterizing instances when components do (or do not) track together. For example, although affective and cognitive channels can independently contribute to judgments of others emotional states [27,30], they also operate in synchrony during more naturalistic socio-emotional tasks [107]. However, far more behavioral research is needed to characterize the co-occurrence of components in people's everyday social interactions. Because people differ in their tendencies to engage distinct components of empathy [101], a better understanding of the separability and interrelations of these components in real-world social scenarios can help tailor empathy-training programs to promote desirable outcomes. Empathy-training efforts are on average effective (Hedges' $g = 0.51$) but generally intervene on empathy as a whole (rather than specific components) [112].

Therefore, characterizing the separability and interrelations of components could better inform research as to when and for whom particular interventions are most likely to improve social and emotional functioning (such as improving relations between groups) or where they might inadvertently do harm (such as exacerbating tension between groups) in future research [21,113]).

The goal of this review has been to evaluate the burgeoning literature on how components of empathy—in isolation or in concert—differentially affect key outcomes including prosocial behavior, relationship quality, occupational burnout, and negotiation. As such, an important takeaway from this review is that components of empathy could be leveraged to facilitate attainment of important goals. A second takeaway is that in order to effectively intervene on empathy in service of promoting specific outcomes, it is important to understand how these components track together (or not) in people’s everyday experiences. Relatedly, the field of empathy would benefit from thoroughly characterizing the structural and temporal relationships among these components to better understand how they work together (or in isolation) to drive key outcomes (see **Outstanding Questions**).

Thus it is no surprise that there has been a growing momentum in research which explicitly examines the spontaneous separation or co-occurrence of dissociable empathy-related components. Several social neuroscience studies have indicated that this is an important aspect of empathy-related inquiry, however comparatively fewer behavioral experiments (including both laboratory and field studies) specifically explore subcomponents’ dissociability. As such, this is a promising direction for empathy-related research in behavioral and naturalistic contexts. Such inquiries are positioned to make incredibly important discoveries about when and for whom specific empathic components reliably predict behavioral outcomes, and to provide insight

into how empathy can be regulated to help people realize critical social, emotional and occupational goals.

Table 1. Examples of studies demonstrating associations between components of empathy and key outcomes

Outcome	Component	Studies	Direction
Helping	Empathic Concern	[7,38–42,50]	Facilitates helping
	Perspective-Taking	[44,45,114]	Facilitates helping
	Experience Sharing	[7,49] [52,115]	Facilitates helping Inhibits helping
Occupational Burnout	Empathic Concern	[9,71,73,116]	Reduces risk of burnout
	Perspective-Taking	[71,116,117]	Reduces risk of burnout
	Experience Sharing	[9,70,72,73]	Increases risk of burnout
Improve Relationship Quality	Empathic concern	[3,4,76,77]	Promotes relationship quality
	Perspective-Taking	[75,118] [78]	Promotes relationship quality Undermines relationship quality
	Experience sharing	[79,80] [81,83,84]	Promotes relationship quality Undermines relationship quality
Negotiation	Empathic Concern	[86] [85]	Facilitates negotiation success Inhibits negotiation success
	Perspective-Taking	[46,119]	Facilitates negotiation success

This table shows examples of studies demonstrating associations between components of empathy (empathic concern, perspective-taking, and experience sharing) and key outcomes (helping, burnout, relationship quality, and negotiation). Note that this table is not intended to be an exhaustive list of research in these domains, but rather illustrate the nuanced relationships between empathy-related constructs and these outcomes. See **Table S1** for study descriptions.

Box 1. When experience sharing is instrumental

Experience sharing specifically refers to vicariously feeling someone else's emotions, and appears to be a separate construct from related phenomena such as behavioral contagion [42]. Of the three components of empathy described in this paper, experience sharing is most frequently predictive of negative outcomes (such as occupational burnout). Such associations lie at the heart of arguments against empathy [11]. However, this is not to say that experience sharing is fundamentally detrimental; on the contrary, experience sharing is an essential aspect of our social functioning. Human beings feel “a species-unique motivation to share emotions, experience, and activities with other persons” [120]. The imperative to share experiences with others can feel effortless and is evident even in our earliest days [121]. As such, it is no surprise that vicariously experiencing others' affective states is a cornerstone of our social functioning and can be associated with important outcomes such as helping behavior [122].

Experience sharing tracks relationship quality at the dyadic level. Emotional convergence—or the tendency for one to modulate his own emotions to better approximate those of an interaction partner—is associated with higher levels of relationship satisfaction [123]. Experience sharing also facilitates group efforts which require coordinated action toward specific goals that would be difficult or impossible for individuals to achieve on their own. For instance, people who share in others' outrage are more likely to engage in collective action [124–126]. Experience sharing can even track workplace benefits, such as occupational commitment and employee satisfaction, and enhance the performance of teams and groups in some contexts [127,128].

Finally, experience sharing can occur almost automatically compared to other components of empathy (such as perspective-taking) which can sometimes require more focused

attention [103]. This means that experience sharing can rapidly engender helping behavior, but—as others have noted—also means that experience sharing may be sensitive to bias [11]. For instance, similar brain regions are activated when a perceiver observes a target is in pain as when a perceiver experiences pain firsthand, which could illustrate the reflexive nature of experience sharing [129]. However, the degree of magnitude of this neural activity differs based on the similarity of perceiver and target. For example, neural activity is greater when a perceiver and target share—versus differ in—race [130]. Because such neural activity is associated with helping, race-based attenuation in neural activity is thought to signify decreased motivation to help different (compared to similar) targets [131].

Experience sharing is an essential aspect of social functioning. However, like perspective-taking and empathic concern, the utility of experience sharing is context-sensitive and susceptible to bias, and could require moderating influence of abilities such as emotion regulation to increase desirable and reduce undesirable outcomes. Future work should therefore seek to understand when and how experience sharing can be regulated in service of specific goals.

Box 2. Evidence for a hierarchical structure of components

Are empathy components experienced simultaneously in time? Or do some components elicit one another? Is there evidence for a hierarchical relationship among them? This line of inquiry has important implications for questions about strategic regulation specifically, but also the field of empathy research more generally.

Experience sharing is sometimes characterized as a lower-order, “bottom-up” and perspective-taking as a more “top-down” and deliberative aspect of empathy [103,104,132]. Empathic concern is sometimes characterized as a motivational state through which experience sharing and perspective-taking affect prosocial behavior [16,26]. There are also notable differences in the effort required to experience each component, which offers some insight into structural relationships among them. For instance, experience sharing is thought to occur almost reflexively, whereas perspective-taking can involve directed attention and effort [103,133], though cf. [134].

Evidence elucidating the structural and temporal relationships of these constructs is limited. However, researchers can gain traction on this question by considering the amount of evidence available for different structural models. Three such models include: (1) a lateral model, in which components exist independently on the same plane and contribute equally to particular outcomes (**Figure IA**), (2) an interactive model, in which experience sharing and perspective-taking interact to elicit changes in empathic concern (**Figure IB**), and (3) a nested model in which experience sharing and perspective-taking can interact independently or interactively to drive higher motivational states such as empathic concern, or bypass empathic concern to produce behavior (**Figure IC**).

Thus far evidence suggests that the nested model (as shown in **Figure IC**) may be the closest depiction of the actual states of the interrelations. Existing work also demonstrates a link between experience sharing and empathic concern [49], and a link between perspective-taking and empathic concern [102]. Furthermore, several studies find that complex social interactions and moral reasoning recruit brain regions related to perspective-taking and experience sharing [107,108]. Such observations have given rise to theories implying a spontaneous interdependence of bottom-up processes involved in experience sharing (such as matching perception and action) and top-down processes (such as contextual appraisal) under a larger framework of empathy [132]. However, there are also instances in which perspective-taking and experience sharing elicit behavioral outcomes while bypassing prosocial motivation (for instance, when experience sharing leads to helping, but as an attempt to attenuate one's personal distress, [135]). Nevertheless the structure of the components in spontaneous empathy is far from settled and is an exciting area for future inquiry.

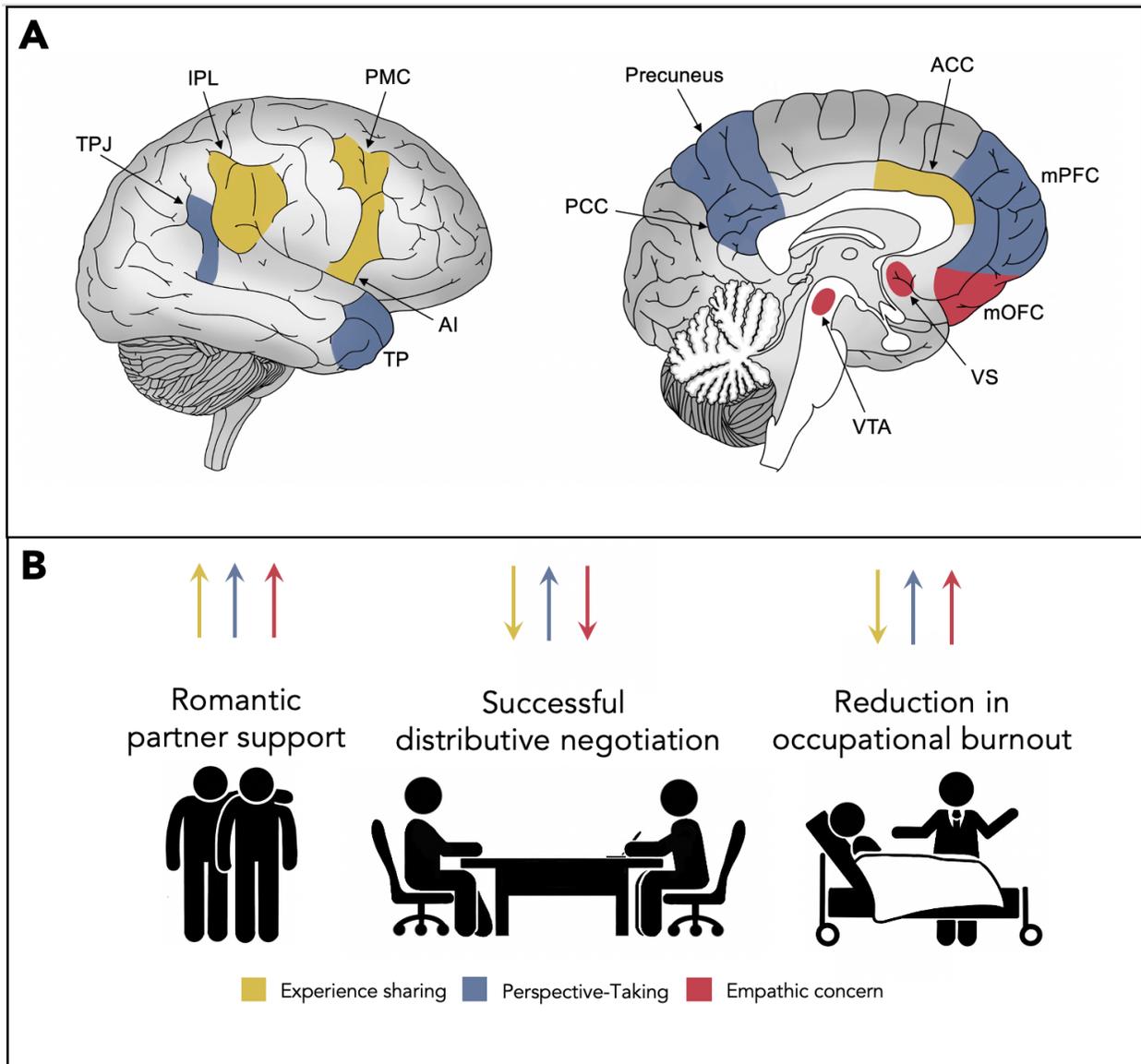


Figure 1. Three separable components of empathy. (A) Reproduced from [26]. Brain regions associated with experience sharing (yellow), perspective-taking (blue), and empathic concern (red). TPJ, temporoparietal junction; IPL, inferior parietal lobule; PMC, premotor cortex; TP, temporal pole; AI, anterior insula; PCC, posterior cingulate cortex; ACC, anterior cingulate cortex; mPFC, medial prefrontal cortex; mOFC, medial orbitofrontal cortex; VS, ventral striatum; VTA, ventral tegmental area. (B) Empathy is flexible, and people can differentially engage specific components across contexts. People appear to be able to up-regulate some components while down-regulating others, depicted here by the changing directions of the arrows across three contexts. The “formulas” shown here can produce the accompanying benefit, though see the following section, ‘Empathy in Context: Different Situations Require Different Components’, for counterexamples.

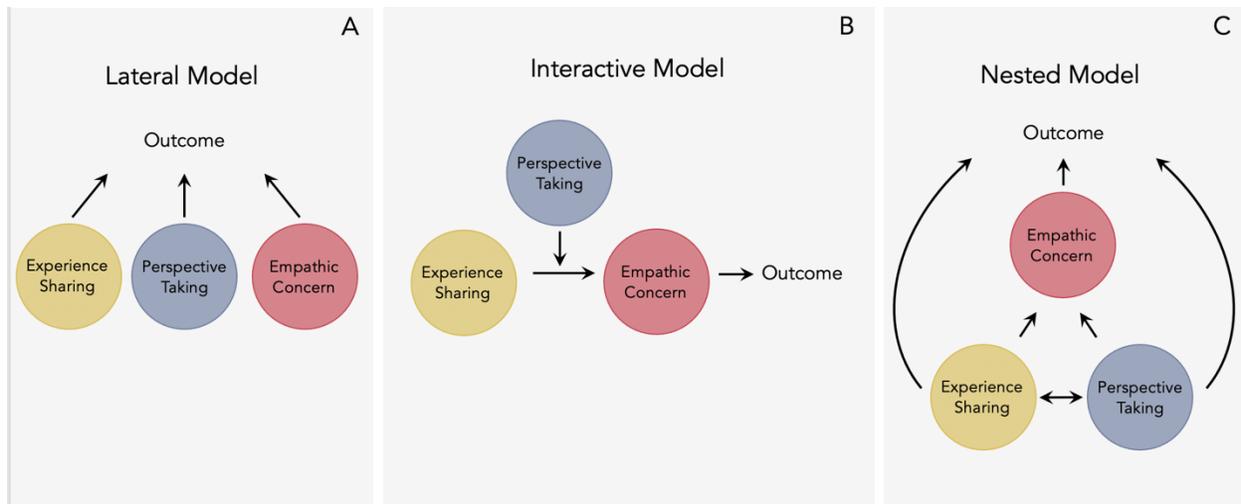


Figure I (Box 2). Potential structural models for empathy-related components. Panel A depicts a lateral model in which components exist independently on the same plane and contribute equally to particular outcomes. Panel B depicts an interactive model, in which experience sharing and perspective taking interact to elicit changes in empathic concern. Panel C depicts a nested model in which components flexibly interact to elicit one another. Note that in the nested model experience sharing and perspective taking can interact to produce empathic concern and subsequent behaviors, but need not do so (unlike in the interactive model).

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