

## Cognition and Neurosciences

# The link between cognitive and affective empathy and interpersonal emotion regulation direction and strategies

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Interpersonal emotion regulation (ER) refers to the different processes aimed at changing the emotional states of others. Some authors have speculated about the pivotal role of empathy for interpersonal ER to happen. However, the very limited empirical evidence suggests that only cognitive empathy as opposed to affective empathy may be a necessary antecedent. As previous research only considered interpersonal affect improvement and showed mixed evidence for the regulation strategies, we aimed to address this gap in the current research. To that aim, 374 adults ( $M = 30.3$  years, 249 female) reported their tendency to engage in cognitive (perspective-taking) and affective empathy (empathic concern and personal distress) as well as their tendency to improve and worsen others' mood, and to use different regulation strategies (situation modification, attention deployment, cognitive change, and modulation of the emotional response) to change others' feelings. Results of the regression analyses showed that while affect improvement was not significantly predicted by any of the empathy variables, affect worsening was positively predicted by personal distress. Concerning the regulation strategies, while cognitive change and situation modification were positively predicted by personal distress, attention deployment was positively predicted by perspective-taking. Overall, the obtained results highlight the need to further investigate the link between empathy and ER and to carefully consider the methods selected for that purpose.

**Key words:** Interpersonal emotion regulation, cognitive empathy, affective empathy, regulation strategies.

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## INTRODUCTION

Most authors have studied emotion regulation (ER) as an intrinsic process, that is, people's tendency to use certain strategies to change their own emotional response (e.g., Gross, 2002). However, it is also necessary to look at the extrinsic domain (Nozaki & Mikolajczak, 2020), since we engage in social interactions that change other people's emotional responses on a daily basis. This process has been labeled interpersonal ER (Niven, Totterdell, Stride & Holman, 2011; Zaki & Williams, 2013). It is important to note that interpersonal ER is conceptualized in this paper as the active efforts to change others' emotions rather than using others as a strategy to modulate one's own emotions (Marroquín, 2011). In addition, although interpersonal ER has been defined as an interactive dynamic process between the agent (i.e., person changing the emotion) and the target (i.e., person who has an emotional response modulated) (e.g., Randall & Schoebi, 2018), in the current research we will focus exclusively on the agent of the regulation process. Finally, our focus will be on explicit or deliberate interpersonal emotion regulation rather than on emotional exchanges that happen at an implicit level where either the agent, the target or both might be unaware of their actions and their effect on the other (Koole & Roethermund, 2011).

When altering others' emotional states, two possible directions may take place. Agents can up-regulate others' positive emotions to improve others' mood (i.e., *affect improvement*). On the other hand, agents can up-regulate others' negative emotions to deteriorate their feelings (i.e., *affect worsening*). To both improve

and worsen others' emotions, agents can use a wide repertoire of regulation strategies (e.g., Niven, Totterdell & Holman, 2009). One of the most supported frameworks to study different regulation strategies is the Process Model of Emotion Regulation (Gross, 2002). According to this model, the emotional response might be impacted by antecedent focused strategies (e.g., by diverting the attention away from the situation) or by response-focused strategies (e.g., suppressing one's emotional response). Although this model was initially conceived to explain intrinsic or intrapersonal ER, some researchers argued that it could be potentially used to account for interpersonal ER as well (Williams, 2007). In fact, Little, Kluemper, Nelson, and Gooty (2012) designed and validated a measure to assess four of the five strategies suggested in the Process Model of Emotion Regulation. Specifically, the measure comprises *situation modification* (i.e., removing or altering a problem to reduce the emotional impact), *cognitive change* (i.e., reappraising a situation as more positive), *attention deployment* (i.e., directing the target's attention to something more pleasant) and *modulation of the emotional response* (i.e., suppressing the emotional responses).

As previously found in intrapersonal ER (Aldao & Nolen-Hoeksema, 2012; Gross & John, 2003), some interpersonal ER strategies have been associated with more adaptive outcomes than others. For example, cognitive change has been perceived as more efficacious to deal with others' stress (López-Pérez, 2018) and has been associated with more social competence (Kwon & López-Pérez, 2021). On the other hand, modulation of the emotional response has been negatively linked with lower trust in others (Little *et al.*, 2012). Hence, the tendency to use certain strategies may have implications for different domains.

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*Empathy and interpersonal emotion regulation*

Some theoretical models of interpersonal IER have suggested that the regulation process occurs once the agent recognizes and understands the emotion of the others (i.e., identification of the mental estate and emotions of others'; Nozaki & Mikolajczak, 2020; Reeck, Ames & Ochsner, 2016). This has led theoretical models to suggest that empathy might be an important antecedent of interpersonal ER (Zaki, 2020). This link has been supported by neuroscientific evidence showing that when engaging in interpersonal ER, people experience brain activation in areas linked to both cognitive and affective empathy (Hallam, Webb, Sheeran *et al.*, 2014).

Empathy is understood as the reactions of one individual to the observed experiences of another, implying cognitive aspects such as perspective-taking (i.e., people's tendency to put themselves in the others' shoes) and emotional responses such as empathic concern (i.e., other-oriented feelings of compassion) and personal distress (i.e., self-oriented feeling of anxiety and distress; Davis, 1983). Importantly, empathic concern and personal distress are qualitatively different emotional responses (for a review see Batson, 2010). Although both emerge when seeing another in need/distress, empathic concern involves focusing on the other's need, whereas personal distress triggers attention to one's own distress provoked by the suffering of the other. This difference has been documented using neuroscientific methods (Singer & Lamm, 2009) as well as in experimental studies evidencing differences in for example prosocial behaviour (Carrera, Oceja, Caballero, Muñoz, López-Pérez & Ambrona, 2012).

From the emotion dynamics perspective, the emotion of the agent can shape the emotion of the target (Sels, Ceulemans & Kuppens, 2018). This has been labeled emotional influencing (i.e., how emotions in one moment may predict other people's emotions (Kuppens & Verduyn, 2017). Following this, one may expect that cognitive and affective empathy may affect whether people want to improve or worsen someone else's mood and whether they may use a certain strategy to achieve this. For example, a study focused on dyadic interactions with romantic couples has shown that cognitive, but not affective empathy, is linked to more successful interpersonal ER (i.e., higher reduction of the partner's distress). This result is hypothesized to be due to cognitive empathy leading agents to select a potential regulation strategy that can reduce more effectively the distress of others by better understanding their potential emotional need (Levy-Gigi & Shamay-Tsoory, 2017). The importance of cognitive empathy for interpersonal emotion regulation has been highlighted in another study showing that cognitive empathy mediated the link between interpersonal ER and higher satisfaction in couples (Florea & Pășăreanu, 2019). It is important to note, that none of these studies evaluated the use of specific regulation strategies and focused exclusively on affect improvement in an experimental setting (i.e., how much distress a member of the couple could reduce in the other partner).

Studies looking at the use of specific strategies have been sparse. One study found that high variability in the use of interpersonal regulation strategies across different contexts and targets was negatively linked with empathic concern and personal distress. However, none of the specific regulation strategies on its own were significantly linked to either empathic concern or

personal distress (Niven, Macdonald & Holman, 2012). However, a different study found that both empathic concern and personal distress were positively linked with antecedent-focused strategies (i.e., situation modification, attention deployment, and cognitive change) and negatively linked with modulation of the emotional response (Little *et al.*, 2012). Overall, these studies seem to provide mixed evidence in regards to the possible association between empathy and interpersonal emotion regulation.

*The present research*

Although some theoretical models have suggested the important role of empathy for interpersonal ER to take place regardless of its adaptiveness (Nozaki & Mikolajczak, 2020; Reeck *et al.*, 2016; Zaki, 2020) the empirical evidence available is sparse, only targeting affect improvement (Levy-Gigi & Shamay-Tsoory, 2017) and with mixed evidence in regards to the associations between empathy and the specific regulation strategies (Little *et al.*, 2012; Niven *et al.*, 2012). This study aims to add to the previous limited research by considering regulators' tendency to engage not only in affect improvement but worsening and the use of specific regulation strategies. Looking beyond affect improvement is important because interpersonal emotional exchanges also include episodes in which agents/regulators may try to deteriorate others' feelings. In fact, previous research has shown that people are motivated to worsen others' emotions (López-Pérez, Hanoch & Gummerum, 2021; López-Pérez, Howells & Gummerum, 2017) and they may use different strategies for that purpose (Niven *et al.*, 2011). In fact, Zaki (2020) has argued that people can be driven by empathic motives when inducing emotions that may not necessarily match what the target wants to feel. Hence, it is important to understand how a tendency to engage in affect improvement and worsening may be shaped by the experience of empathy and whether certain strategies may be more associated with it than others. Furthermore, looking at different regulation strategies is important since they target the emotional response in different moments and they have been associated to distinct outcomes (e.g., Kwon & López-Pérez, 2021; Little *et al.*, 2012; López-Pérez *et al.*, 2017). In addition, previous research has provided mixed evidence in regards to the link with the different dimensions of empathy (Little *et al.*, 2012; Niven *et al.*, 2011). Finally, we argue it is important to look at the links between the study variables for different reasons. First, the obtained results can shed light into the link between empathy and interpersonal ER since most accounts have been at the theoretical level. Second, given that both empathy and interpersonal ER refer to socio-emotional competences, understanding their possible links can also lead to a better understanding of social deficits existing in some clinical conditions (Schipper & Petermann, 2013; Zaki, 2020).

In this research, we hypothesized a priori that cognitive empathy (i.e., perspective-taking) and one aspect of emotional empathy (i.e., empathic concern) would be positively linked to affect improvement and the regulation strategies of situation modification, attentional deployment, and cognitive change, since these constructs have been defined as adaptive in previous research (Batson, 2010; Gross, 2002; Little *et al.*, 2012). On the

other hand, we also hypothesized a priori that personal distress would be positively linked to affect worsening and the regulation strategy of modification of the emotional response as these have been defined as mainly maladaptive responses (Levy-Gigi & Shamay-Tsoory, 2017), since affect worsening can be done for hedonic reasons to hurt others (Niven *et al.*, 2011) and that personal distress can trigger enhanced distress and avoidance (Lishner, Batson & Huss, 2011). Finally, given that some research has found that perspective-taking has also triggered affect worsening in others (López-Pérez *et al.*, 2017) and this link has also been suggested at a theoretical level (Zaki, 2020), we evaluated from an exploratory approach whether perspective-taking was positively linked to affect worsening.

## METHOD

### Participants

An estimated sample of 133 was determined with G\*power (Faul, Erdfelder, Lang & Buchner, 2007). Sample size was determined considering previous research looking at the link between empathy and interpersonal regulation strategies ( $\rho_{H1} = 0.24$ , Little *et al.*, 2012) and a power = 0.80, and  $\alpha = 0.05$ . We recruited 374 ( $M = 30.30$  years,  $SD = 9.96$ ; 123 [32.9%] male, 249 [66.6%] female; 2 [0.5%] cases marked other) participants. One hundred twenty-four participants were recruited at two of the authors' institutions and were awarded a course credit. Furthermore, 250 were recruited through Mturk and were compensated with \$0.20. The study received ethical approval at two of the authors' institution.

### Measures

Interpersonal Reactivity Index (IRI) (Davis, 1983). This 28-item questionnaire evaluates people's tendency to engage in Perspective Taking (e.g., "sometimes try to understand my friends better by imagining how things look from their perspective";  $\alpha = 0.64$ ), Empathic Concern (e.g., "often have tender, concerned feelings for people less fortunate than me";  $\alpha = 0.71$ ), and Personal Distress (e.g., "I try to look at everybody's side of a disagreement before I make a decision,"  $\alpha = 0.63$ ) in a five-point Likert scale (1 = does not describe me well to 5 = describes me very well). The scale of Fantasy was not included as it did not fit the purpose of the study.

The Emotional Regulation of Others and Self-scale (EROS) (Niven *et al.*, 2011). This 20-item questionnaire evaluates people's tendency to improve and worsen their own and others' emotions on a five-point Likert scale (1 = not at all to 5 = a great deal). In the present study, we only used the interpersonal subscales to measure people's tendency to engage in interpersonal Affect Improvement (e.g., "I gave someone helpful advice to

try to improve how they felt";  $\alpha = 0.82$ ) and Affect Worsening (e.g., "I told someone about their shortcomings";  $\alpha = 0.86$ ).

The Interpersonal Emotion Management Scale (IEM) (Little *et al.*, 2012). This 20-item questionnaire evaluates in a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree) whether people use the following strategies to change others' emotions: Situation Modification (e.g., "I work out plans to remove the negative aspects of situations";  $\alpha = 0.82$ ), Attention Deployment (e.g., "When a situation is unpleasant to others, I refocus them by discussing positive issues";  $\alpha = 0.80$ ), Cognitive Change (e.g., "When I want others to feel more positive emotions, I put their problems into perspective";  $\alpha = 0.81$ ) and Modulation of the Emotional Response (e.g., "I encourage others not to express their emotions";  $\alpha = 0.93$ ).

### Data analysis approach

To evaluate the link between cognitive and affective empathy we first conducted correlational analyses. In addition, we ran a multivariate regression analysis considering the regulation strategies (situation modification, attentional deployment, cognitive change, modifying the emotional response) and affect improvement and worsening as outcomes, and cognitive (i.e., perspective-taking) and affective empathy (i.e., empathic concern and personal distress) as predictors. We also controlled for age and sex since some research has shown they can play an important role in both empathy and interpersonal ER (Rosen, Brand & Kalbe, 2016). All these variables were entered as predictors at the same time without following a stepwise procedure.

The analyses were run in Mplus 8 (Muthén & Muthén, 1997–2018) using maximum likelihood restricted (MLR) to account for the ordinal nature of the scales and lack of normality of the sample. Multicollinearity was evaluated in SPSS 24 considering the Variance Inflation Factor (VIF) test. Significant findings were considered at  $p < 0.05$  without any adjustment. However, given that the regression analyses included six outcomes, we also indicated in the Tables what values would not be significant if adjusting the  $p$ -value following a Bonferroni correction ( $p < 0.01$ ). We followed this approach of reporting both (significance without and with adjustment) given that adjusting the  $p$ -value has received some criticism due to the possibility of increasing type II errors (e.g., Feise, 2002).

## RESULTS

Samples did not differ in the study variables and hence they were merged. The results showed that affect improvement was positively linked to perspective-taking and empathic concern. Furthermore, affect worsening was negatively linked with perspective-taking and empathic concern and positively with personal distress (Table 1). For the use of interpersonal ER strategies, results showed that both perspective-taking and empathic concern were linked to situation modification, attention

Table 1. Descriptive statistics and correlations between the variables in the study

	Mean	SD	2	3	4	5	6	7	8	9
1. Perspective Taking	3.51	0.57	0.56**	-0.09	0.41**	-0.24**	0.36**	0.30**	0.26**	-0.28**
2. Empathic Concern	3.54	0.67	1	-0.24**	0.49**	-0.51**	0.23**	0.26**	0.16**	-0.55**
3. Personal Distress	3.18	0.75		1	0.09	0.57**	0.28**	0.28**	0.31**	0.57**
4. Affect Improvement	3.93	0.66			1	-0.13*	0.53**	0.54**	0.45**	-0.09
5. Affect Worsening	2.57	1.19				1	0.19**	0.09	0.23**	0.76**
6. Situation Modification	4.93	0.98					1	0.74**	0.66**	0.25**
7. Attentional Deployment	5.02	1.00						1	0.65**	0.17**
8. Cognitive Change	4.88	1.04							1	0.29**
9. Modifying Emotional Response	3.56	1.79								1

\* $p < 0.05$

\*\* $p < 0.01$ .

deployment and negatively linked to modulation of emotional response, whereas cognitive change was positively linked with perspective-taking and personal distress. Finally, personal distress was linked with the tendency to use all the interpersonal ER strategies, that is, situation modification, attention deployment, cognitive change, and modulation of the emotional response (Table 1).

Results of the regression analyses showed that while affect improvement was not significantly predicted by any of the empathy variables, affect worsening was positively predicted by personal distress. Concerning the regulation strategies, cognitive change and situation modification were positively predicted by personal distress, attention deployment was positively predicted by perspective-taking (Table 2).

Both sex and age were significant predictors for all the interpersonal ER scales except for attention deployment, as only age was significant (Table 2).  $R^2$  was high and significant, ranging from 24.2% to 62.7% denoting a strong relationship among the constructs. Finally, there was no multicollinearity as evidenced in the VIF values (Table 2).

DISCUSSION

Theoretical models suggested that empathy was an important antecedent of interpersonal ER since regulators or agents need to understand first how the target might feel before deciding to change the other person’s emotions and use any regulation strategy (Nozaki & Mikolajczak, 2020; Reeck *et al.*, 2016; Zaki, 2020). One of the studies that has directly evaluated such link showed that only cognitive but not affective empathy was linked with affect improvement (Levy-Gigi & Shamay-Tsoory, 2017). The important role of cognitive empathy was also shown by a different study which suggested that cognitive empathy acted as a mediator between interpersonal emotion regulation and couple’s levels of satisfaction (Floean & Păsărelu, 2019) In regards to the regulation strategies, there is mixed evidence with some research showing significant links between empathy and affect improvement and worsening (e.g., Little *et al.*, 2012) and other showing non-significant links (e.g., Niven *et al.*, 2012). Given that previous research did not target affect worsening and the mixed evidence available in regards to

the link with the specific regulation strategies, we conducted this study to address those gaps.

In regard to the regulation direction (improvement or worsening of others’ affect), the findings showed unexpected results since affect improvement was not significantly predicted by any empathy variables. Previous research found that perspective-taking (cognitive empathy) was positively linked to higher efficacy at improving another person’s emotions (Levy-Gigi & Shamay-Tsoory, 2017) but in this study perspective-taking was not a significant predictor of affect improvement. These conflicting findings may be due to methodological differences as the way that affect improvement was conceptualized was completely different (i.e., situational reports of improved distress by a partner vs. tendency to improve others’ emotions) and reported by different informants (i.e., target vs. agent) in both studies. On the other hand, affect worsening was positively predicted by personal distress. We hypothesized this possible link given that both constructs can refer to maladaptive outcomes (Niven *et al.*, 2011). In addition, this link might be explained by the fact that the agent’s and the target’s emotion might get synchronized (Valdesolo & DeSteno, 2011); that is, when worsening the emotions of the target the agent might also experience distress. However, we did not find any links with cognitive empathy (perspective-taking). Previous research showed that when people were experimentally induced to a perspective-taking condition (i.e., putting themselves in the shoes of the other participant) they were more willing to worsen others’ emotions for altruistic reasons (i.e., to improve others’ well-being in the long-term; López-Pérez *et al.*, 2017). The lack of significant links between personal distress and perspective-taking might be again due to how both constructs have been assessed in previous research and the current study. Overall, these findings highlight the importance of considering personal tendencies beyond experimental measures to understand what the possible links between the constructs can be.

Concerning the link with the regulation strategies, cognitive change and situation modification were positively predicted by personal distress. This result was not in line with our hypotheses since we expected a positive relation with empathic concern instead as they referred to adaptive constructs. A possible *post-hoc* explanation for this finding is that since personal distress can

Table 2. Multivariate regression

Predictors	Affect improvement		Affect worsening		Situation modification		Attentional deployment		Cognitive change		Modifying emotional response		VIF
	Estimate	<i>p</i>	Estimate	<i>p</i>	Estimate	<i>p</i>	Estimate	<i>p</i>	Estimate	<i>p</i>	Estimate	<i>p</i>	
Perspective-taking	-0.018	0.71	0.085	0.13	0.042	0.48	<b>0.151</b>	<b>&lt;0.001</b>	0.003	0.96	0.034	0.54	1.47
Empathic concern	0.023	0.62	-0.013	0.77	0.059	0.18	0.035	0.23	0.009	0.86	0.076	0.07	1.52
Personal distress	-0.024	0.24	<b>0.094</b>	<b>0.04<sup>b</sup></b>	0.067	0.06	0.003	0.85	<b>0.186</b>	<b>0.03<sup>b</sup></b>	<b>0.092</b>	<b>0.04<sup>b</sup></b>	1.12
Sex <sup>a</sup>	<b>-0.573</b>	<b>0.001</b>	<b>0.540</b>	<b>&lt;0.001</b>	<b>0.478</b>	<b>&lt;0.001</b>	<b>-0.043</b>	<b>0.20</b>	<b>0.422</b>	<b>&lt;0.001</b>	<b>0.442</b>	<b>&lt;0.001</b>	1.02
Age	<b>0.320</b>	<b>0.001</b>	<b>0.161</b>	<b>0.001</b>	<b>0.327</b>	<b>&lt;0.001</b>	<b>0.725</b>	<b>&lt;0.001</b>	<b>-0.177</b>	<b>&lt;0.001</b>	<b>-0.462</b>	<b>&lt;0.001</b>	1.08
$R^2$	0.387	<0.001	0.323	<0.001	0.306	<0.001	0.627	<0.001	0.242	<0.001	0.460	<0.001	-

Notes: Significant findings are highlighted in bold.

<sup>a</sup>1 = men, 2 = women.

<sup>b</sup>Non-significant values if adjusting the *p*-value.

trigger extreme negative emotional responses in the regulator (Batson, 2010) this may lead the regulator to activate regulation strategies that would directly and actively change the emotion of the target either by altering aspects of the situation (i.e., situation modification) or the way the target may think about it (i.e., cognitive change). These active efforts can possibly be done by the regulators in order to reduce not only the target's distress but their own. We suggest this possibility as previous experimental studies looking at prosocial behaviour showed how people who experienced high personal distress engaged in such behaviour to reduce their own distress (Batson, Fultz & Schoenrade, 1987; Lishner *et al.*, 2011). On the other hand, the strategy of attention deployment was positively predicted by perspective-taking. This result seems in line with previous research highlighting the pivotal role of cognitive empathy for interpersonal ER (Levy-Gigi & Shamay-Tsoory, 2017). Despite this, future research is needed to see whether this potential link is also apparent when relying on experimental approaches.

Surprisingly, empathic concern did not show any significant relation. Although previous research found links between empathic concern and regulation strategies (López-Pérez & Ambrona, 2015), they evaluated empathic concern as an emotional response rather than as a dispositional tendency and they focused on intrapersonal rather than interpersonal regulation strategies, which may explain the lack of associations found. Despite this, future research should evaluate whether the lack of associations obtained in this study is replicated.

Sex and age were included in the models for adjustment as previous research found mixed effects (Baez *et al.*, 2017; Michalska, Kinzler & Decety, 2013). Our results showed that these variables had a significant effect on the link between ER and empathy and hence should be considered in future studies. Specifically, age was a positive predictor for a higher tendency to engage in interpersonal affect improvement and worsening, as well as the use of situation modification and attentional deployment and lower use of cognitive change and modulation of the emotional response. The higher tendency to engage in interpersonal affect improvement with age might be explained following the socioemotional selectivity theory in which older individuals try to maximize positive emotions (Carstensen, Isaacowitz & Charles, 1999). On the other hand, the higher tendency to engage more in interpersonal affect worsening could be potentially explained by people seeking to engage in more social interactions (regardless of their emotional valence) with age to try to compensate for the lack of it (Cornwell, 2011). The positive link between age and situation of modification and attentional deployment and negative link with cognitive change might be due to the fact that with age, people experience a cognitive decline. This cognitive decline might lead people to use less cognitive demanding strategies (e.g., diverting attention) in order to attain ER (e.g., Scheibe, Sheppes & Staudinger, 2015; Sims, Hogan & Carstensen, 2015; Verhaeghen & Hertzog, 2014). Finally, the negative link with modulation of the emotional response might be due to the fact that this strategy maximizes or maintains negative emotions, which is the opposite people try to achieve as they get older (Carstensen *et al.*, 1999). Finally, in regard to gender, results showed that while women scored higher in affect worsening and the use of different regulation strategies,

men scored higher in affect improvement. Previous research in regards to gender differences in interpersonal ER has shown mixed findings (e.g., Kwon & López-Pérez, 2021; López-Pérez, Morillo & Wilson, 2019) with some studies reporting no differences and other studies suggesting that women/girls tended to engage more in interpersonal ER. The use of regulation strategies seems to support such findings but the tendency to engage in affect worsening and improving do not go in line with such results. Hence, future research should investigate this further.

#### *Limitations and future research*

Although our study aimed to address an important gap in research, it is not without limitations. First, our study is cross-sectional and we cannot make causal inferences about the effect of cognitive and affective empathy on the direction and interpersonal regulation strategies. Hence, future research would benefit from using an experimental or longitudinal approach to evaluate the causal links. Second, our data was collected considering only the agent's perspective (i.e., propensity to experience cognitive and affective empathy and to engage in interpersonal ER) and relied on the use of self-reports. Given the dynamic nature of the interpersonal ER process (Reeck *et al.*, 2016), future research would benefit from collecting dyadic data from both the agent and the target to understand the effect of experiencing either empathic concern or personal distress when aiming to address the target's emotional needs. In addition, the use of performance measures for both empathy and interpersonal ER could provide evidence with higher ecological validity. In this sense, the measures used in the study assumed that interpersonal ER changed for example the emotion of the target (i.e., improving or worsening) but without having the target's perspective we cannot be sure whether people's propensity to engage in interpersonal affect improvement or worsening do materialize in any emotional changes in the target. Finally, when evaluating the regulation strategy, the questionnaire used did not differentiate as to whether they were used for improving or worsening the target's emotions. Given that these strategies can be potentially used for both (Niven *et al.*, 2011), future research should take a more nuanced approach to better understand the possible links between the study variables.

#### CONCLUSIONS

Interpersonal ER is an important process given its social implications and hence more research is needed to better understand this process and the link with other socio-emotional skills. This study has shown some divergent findings compared to previous studies. Hence, future research should consider the methods used as this can lead to very different results. Although there are still pending questions in regards to the links between the constructs explored, we hope this will open the path to future studies to disentangle the links between empathy and interpersonal ER.

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## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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