A Study on Empathy and Real-Life Attentional Control: An Interplay between Socio-Emotion and Cognitive Factors

By Dr. Kalpna Thakur

Abstract- Empathy is one of the important elements of social cognition and helping behavior. It is classified into two i.e., cognitive and affective facets. Cognitive empathy refers to the ability to comprehend others' thoughts and feelings, whereas affective empathy refers to the inclination to be impacted by others' emotions. Successful attentional control has been linked to higher cognitive empathy but lower affective empathy. We wanted to see if empathy has anything to do with real-life cognitive errors like attentional control. Using the widely-validated Cognitive Failures Questionnaire (CFQ) and the Questionnaire of Cognitive and Affective Empathy, we looked at the association between individual differences in the proneness to experience everyday cognitive failures and cognitive versus affective empathy in a sample of 384 people. We discovered qualitatively different associations between general cognitive failures and the two components of empathy, such that people with cognitive failures had a lower tendency to grasp others' perspectives but a higher feeling for others' emotions.

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1. Introduction

Adaptive human contact requires the ability to understand another person's perspective, including their ideas and feelings. This is especially true when another person's viewpoint differs from one's own. It enables a person, for example, to recognize that a buddy may find a topic uninteresting even if they find it fascinating. Although typical terminology for comparable if not isomorphic notions in the literature includes the theory of mind and mentalizing, we refer to this psychological process as cognitive empathy here (Quesque & Rossetti, 2020). Another significant part of empathy is experiencing another's feelings, such as becoming distressed while observing another person cry, which is comparable to emotional contagion effects, but with the knowledge that the source of the emotion is someone else (de Vignemont & Singer, 2006). We refer to this as affective empathy.

In healthy individuals, there is strong evidence that cognitive and affective empathy are distinct psychological processes with distinct neural networks (Cox et al., 2012; Kanske, Böckler, Trautwein, & Singer, 2015), and that they are all the more dissociated in terms of regions of damage and function lost after brain injury (Kanske, Böckler, Trautwein, & Singer, 2015; Shamay-Tsoory, Aharon-Peretz, & Perry, 2009). On the other hand, adaptive social behavior is the result of cognitive and affective empathy working together (Preckel, Kanske, & Singer, 2018). Understanding without feeling can lead to callous exploitation of others (e.g., extreme psychopathy; Lamm, Bukowski, & Silani, 2016), whereas feeling without understanding can lead to self-focused emotion management rather than compassion or assisting others (Weisz & Sikara, 2021). As a consequence, we'll look at the processes that lead to individual differences in cognitive and affective empathy.

Given the importance of cognitive and affective empathy in our relationships with others, it's crucial to understand how they work and, in particular, if any psychological processes support or are linked with their functioning. In terms of possible mechanisms, there's a case to be made that good attentional control is linked to a high level of cognitive empathy. From a functional standpoint, they both necessitate the capacity to change perspectives/points of emphasis. Three different lines of evidence support this reasoning. For starters, the functional magnetic resonance imaging (fMRI) studies indicate that the brain areas involved in their respective processes are similar: Tasks that require participants to shift their attention (i.e., gauge attentional control) activate the temporoparietal junction (TPJ) (Corbetta, Patel, & Shulman, 2008; Schuwerk, Schurz, Müller, Rupprecht, & Sommer, 2017). Second, in people with neuropsychological problems, attentional control, and cognitive empathy deficits frequently coexist (e.g., Fliss et al., 2016; Lin et al., 2021). Third, it was recently discovered that people who excel at aspects of attentional control such as switching between tasks efficiently and effectively, scored higher in cognitive empathy than people who did not (Goodhew et al., 2020; Goodhew & Edwards, 2021). This suggests that a high...
level of attentional control is associated with a high level of cognitive empathy.

While there is evidence that attentional control is linked to increased cognitive empathy, there is also evidence that it is linked to decreased affective empathy. The distinction between ‘bottom-up’ attentional orienting, which is driven by properties of the external environment (e.g., attention captured by an emotionally expressive face), and ‘top-down’ attentional orienting, which is driven by goal-execution (e.g., attention allocated only to green stimuli if these are task-relevant) is critical in attention (Awh, Belopolsky, & Theeuwes, 2012). Different people have different levels of balance between stimulus-driven and goal-driven aspects of attention. Heightened and rigid goal-driven attention may make a person impervious to signals of others' distress from a functional standpoint. Indeed, one theoretical interpretation proposes that psychopaths who lack affective empathy have extremely strict goal-driven attentional control (Lamm et al., 2016, Wolf et al., 2012). While the deficiencies associated with psychopathy are likely to extend beyond this attentional element (e.g., lower empathetic care for others), this correlation may indicate one extreme of a broader negative relationship between attentional control and affective empathy. Consistent with this, is a study that shows that Individuals who score better in the attentional focusing part of attentional control (i.e., the ability to focus in the face of distraction) report lower levels of affective empathy (Goodhew & Edwards, 2021). Consequently, a lack of attentional control is linked to a lack of affective empathy. Affective empathy may be adversely affected by attentional control. Alternatively, it has been shown elsewhere that affective empathy can inhibit cognitive empathy (Kanske, Böckler, Trautwein, Parianen Lesemann, & Singer, 2016). As a result, the causation for the attentional control-empathy relationship could be flipped, with high affective empathy impairing attentional control. We wanted to build on this previous study by looking into possible connections between components of cognitive functioning that have been tied to attentional control and have also been linked to real-world performance. While attentional control is an important part of how humans manage their resources, it may be seen as a subset of broader features of cognitive control that have been proven to be highly predictive of major real-world outcomes, ranging from the likelihood of vehicle accidents to life satisfaction. As a result, we examined these cognitive abilities to see if they were linked to better or worse cognitive and affective empathy.

II. Method

a) Sample and Procedure

The sample consisted of 384 participants from Himachal Pradesh University, India. The sample was in the age range of 20 to 30 years with the mean age being 25. Both male (203) and (181) female participants were included in the study. A convenient sampling technique was used. Informed consent for participation was taken from the participants. The authors reported the study's purpose and importance to the participants. The researchers informed all of the volunteers that their identities and responses would remain anonymous. The questionnaires were given to the participants after this. The present research was approved by the Ethics Committee of the University.

b) Measures

Cognitive Failures Questionnaire (CFQ) (Broadbent et al., 1982):

The CFQ has 25 questions with five options per question ranging from Never (0) to Very Often (4) when it comes to undergoing these errors. While the CFQ has traditionally been treated as a single concept, a more recent factor analysis suggests that the CFQ is comprised of three factors: forgetfulness, distractibility, and false triggering (Rast, Zimprich, Van Boxtel, & Jolles, 2009). Furthermore, there is evidence that these variables have substantially different associations with cognitive functioning (Thomson & Goodhew, 2021). The significance of these subscales was considered in the present study. Each subscale contains 8 items from the original CFQ.

Questionnaire of Cognitive and Affective Empathy (Reniers et al., 2011): There are 31 items in total. There were 19 and 12 items for measuring Cognitive Empathy and affective empathy, respectively. Respondents had to select one of four response options ranging from Strongly Agree (4) to Strongly Disagree (1) to indicate their level of agreement with each question.

III. Results

a) Descriptive Statistics

Table 1: Descriptive Statistics for each of the scales used

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forgetfulness</td>
<td>15.67</td>
<td>3.89</td>
<td>.76</td>
</tr>
<tr>
<td>Distractibility</td>
<td>15.56</td>
<td>3.79</td>
<td>.68</td>
</tr>
<tr>
<td>False Triggering</td>
<td>11.72</td>
<td>4.21</td>
<td>.74</td>
</tr>
<tr>
<td>CFQ Total</td>
<td>44.39</td>
<td>12.23</td>
<td>.89</td>
</tr>
<tr>
<td>Cognitive empathy</td>
<td>54.48</td>
<td>8.21</td>
<td>.88</td>
</tr>
<tr>
<td>Affective empathy</td>
<td>33.68</td>
<td>5.51</td>
<td>.76</td>
</tr>
</tbody>
</table>
b) The association between cognitive failure and empathy

A Pearson Product Moment correlation coefficient of $r (437) = -0.30$, $p < 0.001$, demonstrated a negative association between Cognitive Failures and Cognitive Empathy. This indicates that those who are prone to cognitive failures have a harder time understanding the thoughts, feelings, and perspectives of others. Cognitive Failures and Affective Empathy, on the other hand, had a positive connection $r (437) = 0.39$, $p < 0.001$. This suggests that those who have cognitive errors are more likely to report feeling other people's emotions.

Following that, we wanted to see how the two components of empathy interacted with cognitive errors. We used a linear multiple regression using CFQ scores as the criterion and Cognitive Empathy and Affective Empathy as predictors to achieve this. Overall, there was a significant model (Adjusted-$R^2 = 0.21$, $p < 0.001$). Affective Empathy was a positive predictor ($\beta = 0.39$, $p < 0.001$), whereas Cognitive Empathy was a negative predictor ($\beta = -0.30$, $p < 0.001$).

Figure 1: Association between CFQ (Total) and Cognitive Empathy

Figure 2: Association between CFQ (Total) and Affective Empathy
c) The role of CFQ subscales in the association between cognition and empathy

To determine the unique associations between these factors, we ran two multiple regression analyses, with the three CFQ subscales as predictors in both models and the criterion for one was Cognitive Empathy, while the other was Affective Empathy. When Cognitive Empathy was used as the criterion, the entire model was significant (Adjusted-$R^2 = 0.11$, p.001). Forgetfulness was shown to be positively associated with Cognitive Empathy ($\beta = 0.32$, p =.001), whereas Distractions was found to be negatively related ($\beta =- 0.39$, p =.001) and False Triggering was found to be unrelated ($\beta = 0.15$, p =.059). There was a significant overall model (Adjusted-$R^2 = 0.11$, p.001) when Affective Empathy was entered as the criterion, although none of the components were uniquely correlated to Affective Empathy ($\beta = 0.11$, $\beta = 0.12$, $\beta = 0.11$, $p =.227$, $p =.081$, $p =.173$ for Forgetfulness, Distraction and False Triggering respectively).

IV. DISCUSSION

The CFQ-empathy correlations were shown to be more nuanced when the three subcomponents of the CFQ (Rast et al., 2009) were considered. This distinction appeared to be of little use in the case of Affective Empathy, as all three components appeared to contribute to explaining this element of empathy via shared variance. However, for Cognitive Empathy, the different subcomponents yielded unique relationships. Individuals prone to Distractions had lower Cognitive Empathy, but those prone to Forgetfulness had higher Cognitive Empathy. In comparison, when CFQ was considered a unitary construct, there was a negative association between Cognitive Empathy and CFQ. Distractions was linked to a decrease in Cognitive Empathy.

Many of the Distractions issues are related to socio-emotional cognitive errors including failing to hear someone speak to you, losing your temper, or unintentionally insulting someone. According to one theory, many of these cognitive mistakes could be the result of a failure to acquire another person's beliefs, feelings, and perspectives. For example, failure to grasp the views of individuals with whom one interacts can lead to losing one’s anger. Inadequate and/or unavailable cognitive resources may be to blame for the inability to participate in cognitive empathy. Considering someone’s perspective necessitates the ability to construct and maintain two unique cognitive representations at the same time, as well as the agility to move between them. From a cognitive standpoint, this is a challenging demand that will almost certainly necessitate efficient cognitive control. It has been shown that, although having fully established cognitive empathy capability, adult participants do not always use it in their thinking (Keysar, Lin, & Barr, 2003). One of the factors that could influence whether people participate in cognitive empathy in a particular scenario is the availability of cognitive resources. The availability of such resources will most likely be determined by the interaction between an individual’s existing capability (e.g., working memory capacity), the situation (how much these resources are being strained), and their affective empathy level (see Kanske et al., 2016).

It was surprising to find a positive correlation between forgetfulness and cognitive empathy. This factor is defined by Rast et al. (2009) as the proclivity to let go or lose track of things, including intentions. Perhaps because intention-focused behavior typically leads to self-focused thoughts and actions, people who have a shakier grasp on their intentions are better able to engage with the people they meet. It’s also worth noting that this factor predicts better visual search performance (Thomson & Goodhew, 2021), implying that forgetful people are successful in some cognitive contexts. Most importantly, the current study demonstrates the criticality of not classifying cognitive failures as a single entity, as is common in the literature, since that can obscure and mislead about if and how CFQ is associated with performance. If only the total score is considered, subfactors with markedly distinct associations with other variables may average out to a mistaken absence of an overall association.

We do not believe that the negative association between Cognitive Failures and Affective Empathy indicates good cognitive control, which makes one less likely to make common cognitive errors, and makes you cold and unhelpful, because, as discussed earlier, adaptive socio-emotional function and helping social behavior are dependent on the interaction of empathy's cognitive and affective components (Weisz & Cikara, 2021). When a person sees a friend in tears, for example, they may become preoccupied with their distress rather than validating the friend’s feelings or seeking to understand their friend’s perspective and how to help them. As a result, if a sufficient level of affective empathy is met, increasing affective empathy beyond that level may be harmful (Preckel et al., 2018; Weisz & Cikara, 2021). This may be especially the case if affective empathy is not accompanied by an appropriate degree of cognitive empathy – for example, in the situation above, having trouble understanding the source of the distress may make the individual more prone to maladaptive helping behaviors and self-focused emotion regulation. Furthermore, empathic concern (Weisz & Cikara, 2021) is likely to be another significant predictor. As a result, more research is needed to determine the optimal balance of the various aspects of empathy that lead to sympathy and help. The current results suggest that cognitive variables are significant predictors of individual variation in empathy's various components.
V. Conclusion

To conclude, people who are susceptible to distractibility-related cognitive errors have a poor understanding of others’ perspectives, whereas people more prone to goal-related failures have a better understanding. Individuals who are susceptible to cognitive failure have a higher likelihood of being swayed by others around them.

Declaration

Conflict of Interest: There is no conflict of interest.

Data availability statement: All data generated and analyzed during this study are available from the corresponding author on reasonable request.

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Neuroscience, 11(9), 1383–1392. https://doi.org/10.1093/scan/nsw052