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FEELING FOR AND WITHOUT OTHERS

Assessing the Relationship Between Empathy and Loneliness in Children and Adolescents

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ABSTRACT

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This study investigated the relation between empathy and loneliness in Finnish children and adolescents. Empathy refers to the ability to share and understand others' emotional states, and it can be divided into three main components. Affective empathy refers to an emotional response to another person's emotional display, cognitive empathy to understanding the perspective of the other person, and prosocial motivation to the tendency to support the other person one empathizes with. Loneliness refers to experienced deficiency in one's social relationships, and it can be divided into two dimensions: peer network and dyadic. Peer network loneliness means the absence of a social network, whereas dyadic loneliness means the absence of emotionally intimate, close attachment. My research question was whether peer network loneliness and dyadic loneliness can predict different empathy components. Based on previous research, my hypothesis was that both higher peer network and dyadic loneliness would predict lower scores for all three empathy components.

The data was collected as part of Tampere University's research project "Tunteet läpi elämän" in 2021 and 2022. The final sample consisted of 81 Finnish children and adolescents between 8 and 15 years old. Each participant filled out two self-report questionnaires; one to measure empathy (Empathy Questionnaire for Children and Adolescents, EmQue-CA) and one to measure loneliness (Peer Network and Dyadic Loneliness Scale, PNDLS). The association between empathy and loneliness scores was examined using linear regression analysis.

In line with my hypothesis, cognitive empathy and prosocial motivation were negatively associated with dyadic loneliness. However, the current study found no association between dyadic loneliness and affective empathy, nor between peer network loneliness and any empathy component.

The results of this study show that assessing empathy and loneliness as multidimensional constructs can provide a more comprehensive understanding of these two phenomena. The findings differed significantly based on the type of loneliness and the component of empathy. The findings of this study suggest that only dyadic loneliness is linked to empathy, and more specifically to the cognitive and prosocial components. Considerably more research on the topic is still needed, and in the future the association between empathy and loneliness should be studied more both in children and adults, without diminishing the multidimensionality of either phenomenon.

Keywords: empathy, loneliness, peer network, dyadic friendship

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1 INTRODUCTION

Humans are social beings by nature. Social relationships are fundamental to one's well-being, as social isolation and loneliness have consistently been linked to a variety of adverse phenomena, such as poorer overall health, sleep dysfunction, and more depressive symptoms in both adults and children (Cacioppo et al., 2002; Harris et al., 2013; Hawkley & Cacioppo, 2003). Worryingly, the Finnish School Health Promotion Study 2021 found youth loneliness rates to have increased; in grades 8 and 9 of basic education, already more than 20% of girls and around 10% of boys felt lonely (Helakorpi & Kivimäki, 2021). It is relevant to note that one can feel lonely in different ways, either by missing close emotional relationships (*emotional loneliness*) or the sense of belonging to a group (*social loneliness*) (Weiss, 1973). Therefore, the risk of experiencing loneliness does not exist solely for those with a complete lack of desired social relationships, but for a much larger number of people in different types of situations. For example, one might feel satisfied in regard to being part of a peer network but still experience devastating loneliness in terms of lacking emotionally intimate dyadic attachment.

Social competencies are needed to build both close relationships and social networks, and empathy, the ability to share and understand others' thoughts and feelings (Batson et al., 1987), can be seen as an important foundation for this. For instance, empathy development in adolescence has been found to predict social competencies in adulthood (Allemand et al., 2014) and the aim of many anti-bullying interventions is to promote empathy in students as it is a significant predictor of bullying and defending behavior (Garandeau et al., 2021). To gain insight into the roots of loneliness, it is important to understand how the building blocks of social relationships, such as empathy, relate to it. To date, there have been only a few studies on the relationship between empathy and loneliness. A negative association has been found across the adult lifespan (Beadle et al., 2012; Mwilambwe-Tshilobo et al., 2022), but there has been no previous research assessing the link between these two phenomena in childhood. Additionally, no previous studies have assessed this connection in a more comprehensive manner by separating both the two types of loneliness and different empathy components. This study set out to address this gap in current knowledge and thus investigates the possible link between different empathy components and both social and emotional loneliness in Finnish children between 8 and 15 years old.

1.1 Loneliness

Loneliness can be defined as a subjective negative experience of a discrepancy between desired and actual social relationships (Peplau & Perlman, 1982; Weiss, 1973). More specifically, it refers to an experienced deficiency in one's social relationships, the cognitive awareness of this state, and the consequent negative emotional reactions such as sadness, emptiness, or longing (Asher & Paquette, 2003). It is necessary to emphasize that loneliness is a subjective feeling; it is not directly related to the factual number of social interactions (Hu et al., 2020). Therefore, loneliness cannot be determined by an outside observer. One might "look lonely" but be fully satisfied with their social relationships. Likewise, one might seem socially connected yet feel immense loneliness.

Furthermore, it is not enough to examine this experienced deficiency in social relationships as a unidimensional phenomenon. Loneliness was first divided into two dimensions, social and emotional, by Weiss (1973). Social loneliness refers to the perceived absence of a social network, while emotional loneliness refers to the perceived absence of close, emotional attachment (Weiss, 1973). Although the names used for each dimension occasionally vary, previous research has established the existence of these two dimensions (Hoza et al., 2000; Junttila & Vauras, 2009; Maes et al., 2017). It is also important to note that social and emotional loneliness do not necessarily coincide (Salo et al., 2020); for example, one may have intimate close friendships, but simultaneously feel that they are not part of any group or peer network. In addition, Salo et al. (2020) have suggested that the longitudinal development of each type of loneliness is relatively independent of one another.

With the negative experience of not having the social relationships and support one desires come various adverse phenomena; in previous research, social isolation and loneliness have consistently been linked to a variety of health risks. In adults, loneliness has been associated with excessive stress reactivity (Cacioppo et al., 2002; Cacioppo & Hawkley, 2003), greater age-related increase in blood pressure (Cacioppo et al., 2002), sleep dysfunction (Cacioppo et al., 2002; Steptoe et al., 2004), and overall poorer health (Hawkley & Cacioppo, 2003). Similarly, in childhood, loneliness has been associated with more depressive symptoms, poorer general health, and more sleep difficulties, both in the form of taking longer to get to sleep and having more sleep disturbances (Harris et al., 2013). It has also been suggested that experiencing high levels of loneliness in middle childhood could prolong these health effects to last several years, even when the experienced loneliness reduces to a normal level in preadolescence (Harris et al., 2013). Thus, regarding loneliness in childhood, it is important to take the possible long-term adverse implications into account.

When considering children's social relationships and loneliness, it is also necessary to note the difference between these phenomena in childhood and adulthood. Children's social environment is typically much more closed off; their peer network and their close dyadic friendships often take place in the school context (Asher & Paquette, 2003). For adults, their social environment is generally more varied with work, romantic relationships, and more separate friendships from different contexts. Despite the perceived simplicity of children's social environments, loneliness has been proven a meaningful construct to study even in young children, particularly in the sense of peer acceptance versus rejection. Already at 5 to 6 years of age, children have a basic understanding of loneliness in terms of solitude and the following negative affective state (Cassidy & Asher, 1992). This refers more to the social dimension of loneliness, which is logical considering the socioemotional development in childhood. Before the need for emotional closeness, friendships are largely determined by whom one likes to play with, and thus loneliness predominantly means a lack of peers to play with (Asher & Paquette, 2003; Howes, 2009). The emotional closeness of children's dyadic friendships develops gradually during middle childhood and adolescence (Berndt, 2004). After this developmental milestone, it is not simple to determine which type of loneliness would be more significant to focus on. Experiencing high levels of stable peer network loneliness has been associated with depressive symptoms (Harris et al., 2013; Ladd & Ettekal, 2013). However, some studies (e.g. Nangle et al., 2003) have demonstrated that it is especially dyadic friendships that influence feelings of loneliness and depression most directly. Additionally, it is important to note that although peer acceptance and dyadic friendships are separate concepts, there is a strong connection. Popularity among peers also increases the likelihood of having dyadic relationships, as being generally liked by more people does provide a child with more opportunities to form friendships (Nangle et al., 2003).

A widely used tool for assessing loneliness in adults is the UCLA Loneliness Scale, which has high reliability and validity across different contexts (Russell, 1996). However, the UCLA Loneliness Scale assumes loneliness to be a unidimensional construct and does not differentiate between social and emotional loneliness. Hoza et al. (2000) developed the Peer Network and Dyadic Loneliness Scale (PNDLS), a self-report tool to measure children's loneliness in both social and emotional dimensions. This scale refers to the dimensions as peer network loneliness and dyadic loneliness, and I will be using these names throughout this thesis. The PNDLS consists of a total of 16 items evenly distributed between peer network loneliness and dyadic loneliness. The items were not placed in a specific context (e.g., school) to assess children's loneliness independent of setting. Junttila & Vauras (2009) introduced a modified and translated Finnish version of the PNDLS, which includes five items for each of the two loneliness subscales.

1.2 Empathy

Empathy is a complex construct, and several definitions have been used in previous research and literature. The great number of varying definitions of empathy reflects the construct's multidimensional nature. At a fundamental level, empathy can be defined as the ability to share and understand others' emotional states (Batson et al., 1987). For the past few decades, it has been established that empathy more precisely consists of both an affective and a cognitive component, and it is crucial to acknowledge both of these elements (Cuff et al., 2016; Davis, 1983; Jolliffe & Farrington, 2004). However, there is also a quite general agreement on an additional component, prosocial motivation, making empathy a concept made up of three components in total (Decety & Jackson, 2004). Firstly, an affective response to another person's emotional display; for example, feeling sad themselves when seeing another person display sadness. Secondly, a cognitive capacity to understand the perspective of the other person, such as understanding why a friend is sad. And thirdly, regulatory mechanisms that make the distinction between one's own and others' feelings. This third component is most often expected to lead to prosocial behavior, such as consoling or supporting the other person (Rieffe et al., 2010), and this third aspect of empathy can thus be measured straightforwardly as the intention to support or prosocial motivation (Overgaauw et al., 2017). Additionally, empathy and sympathy are two concepts that are sometimes confused and used interchangeably. To generalize, the affective response in empathy is thought to be similar to how the other person feels, whereas sympathy is thought to refer to an emotional response of concern for the other (Eisenberg et al., 2013).

Empathy and its different components develop throughout childhood, from infancy to adolescence. The brain systems relevant to affective empathy develop earlier than the ones relevant to cognitive empathy, pointing to the cognitive component developing later than the affective component (Knafo et al., 2009). Additionally, there have been findings of positive correlations indicating moderate consistency between the two components (e.g., Knafo et al., 2009). Therefore, these different aspects can be viewed as connected through a shared underlying empathy disposition but also partially unique and separable as they are only moderately correlated and develop at different rates (Knafo et al, 2009). Nevertheless, a rudimentary level of empathy as a whole develops very early in childhood; already at the age of 2 years most children have the capacity for simple cognitive and emotional empathy, as well as for aiming to alleviate the other person's discomfort through their own behavior (Zahn-Waxler et al., 1992). By 4 to 5 years of age, children are typically able to take

another's perspective in false belief tasks, which is often seen as an indicator of having developed a theory of mind (Wellman et al., 2001). Theory of mind refers to having a representation of another's mind and mental state and being able to make predictions about their behavior based on this understanding (Premack & Woodruff, 1978). This ability to understand others' perspectives is essential for developing one's cognitive empathic capacities further and allows for more effective helping strategies, as the other person's situation is presumably viewed more accurately (McDonald & Messinger, 2011). Empathic capacities then keep developing in middle and late childhood, as well as in adolescence, due to developmental changes in cognition, socio-emotional skills, and moral reasoning (Eisenberg et al., 2013). In adolescence, particularly changes in moral reasoning, improvements in abstract thinking, and better emotion regulation abilities promote empathy development (Eisenberg et al., 2013).

There have been many different approaches to measuring empathy; the most common measures can be categorized into self-report, behavioral or neuroscientific approaches. Self-report questionnaires are perhaps the most commonly used tools, such as the Interpersonal Reactivity Index (IRI; Davis, 1983) and the Empathy Quotient (EQ; Baron-Cohen & Wheelwright, 2004). For assessing empathy in very young children (infants and toddlers) that are not capable of self-reporting, parent-report questionnaires can be used instead (Rieffe et al., 2010). Aside from different types of questionnaires, behavioral observational and physiological measures have also been utilized. In behavioral methods, participants often evaluate experimental stimuli, or their performance on tests is assessed (Neumann et al., 2015). For example, in the Picture Viewing Paradigms (PVP; Westbury & Neumann, 2008), participants are shown empathy-eliciting images and asked to rate their responses to each image. Regarding neuroscientific measures, neuroimaging such as fMRI has been used to study the neural systems for empathy, and affective and cognitive empathy have been found to activate separate brain networks (Nummenmaa et al., 2008; Richardson et al., 2018).

In this study, empathy was measured using the Empathy Questionnaire for Children and Adolescents (EmQue-CA), which is a modified version of the equivalent parent-report tool, the Empathy Questionnaire (EmQue; Rieffe et al. 2010). The EmQue-CA focuses on the previously mentioned three aspects of empathy: affective empathy (the extent to which one feels for the emotional state of the other person), cognitive empathy (the extent to which one understands why the other person feels the way they do) and intention to comfort (Overgaauw et al., 2017). The EmQue-CA is designed to assess empathy in children and adolescents with typical development, aged 10 years and older (Overgaauw et al., 2017).

1.3 The Relationship Between Empathy and Loneliness

Previous studies have found lonely people to have poorer social skills (Lodder et al., 2016; Segrin & Flora, 2000), but at the same time, loneliness is related to inaccurate perception of one's own social abilities; lonely people tend to perceive their social skills as poor even when rated as normal by others (Jones et al., 1981; Segrin & Kinney, 1995). This discrepancy could be explained by several different factors, such as lonely people having higher neuroticism and social anxiety (Beadle et al., 2012; Russell, 1996; Segrin & Kinney, 1995). However, this could also suggest lonely people are less accurate in perceiving the thoughts and feelings of others (Beadle et al., 2012); in other words, they have a lower level of *empathic accuracy*. Likewise, higher empathic accuracy is generally associated with positive relationship outcomes in adults, such as higher commitment and better dyadic adjustment (Ickes & Simpson, 2001), and more positive peer interaction in children (Dodge et al., 1985). On the contrary, Hu et al. (2020) pointed out how several studies support the idea that loneliness has a positive influence on sensitivity to social information, thus possibly enhancing empathy and socially skilled behavior. For instance, Gardner et al. (2005) demonstrated that lonely people have increased incidental recall of social events, as well as higher recognition of emotional vocal tones and emotional facial expressions.

Previously, the direct link between empathy and loneliness had predominantly been assessed in younger adults (Davis, 1983; Kalliopuska, 1986). These older studies found a negative association between the two phenomena. However, it is relevant to note that these older studies did not use modern standard measures of loneliness; for example, Kalliopuska (1986) measured loneliness through open-ended questions. Nevertheless, more recent research has additionally established the same result of loneliness and empathy being inversely correlated, finding this negative association across the adult lifespan (Beadle et al., 2012; Mwilambwe-Tshilobo et al., 2022). There may also be differences between age groups; Mwilambwe-Tshilobo et al. (2022) found the negative associations between loneliness and empathy to be more robust for older adults than younger adults.

Partly conversely, Hu et al. (2020) found lonely people to be more likely to exhibit positive empathy but to avoid negative empathy. In other words, empathize more with others' positive feelings, but not negative ones. According to their explanation, loneliness increases the motivation for seeking social support while simultaneously minimizing the risk for negative emotional outcomes, which directs lonely people to empathize more with others' positive emotional states but not negative ones. This aspect makes the link between loneliness and overall empathy (both positive and negative)

slightly less straightforward. Nevertheless, most of the previous research provides support for a negative association.

1.4 Research Question and Hypothesis

Whilst some research has been carried out on the relationship between empathy and loneliness in adults, there have been no previous studies that have investigated this connection in children. Additionally, the relationships between empathy and different types of loneliness have not been investigated previously. Investigating these links is important to better understand how empathy, one building block of social relationships, relates to the experience of lacking either a peer network or close dyadic relationships already in childhood. A better understanding of the connection between these phenomena in children and adolescents can lay the foundation for further researching the roots of childhood loneliness and knowing whether it is something that could be influenced positively, for example through promoting empathy or social skills.

In this study, I investigate whether empathy is related to peer loneliness and dyadic loneliness in children between 8 and 15 years old. Based on previous research (Beadle et al., 2012; Davis, 1983; Kalliopuska, 1986; Mwilambwe-Tshilobo et al., 2022), I hypothesize that there is a negative association between empathy and loneliness, including both peer network loneliness and dyadic loneliness. To test this hypothesis, I will examine the relationship between different components of empathy and the two types of loneliness. Specifically, I will investigate whether affective empathy, cognitive empathy, and prosocial motivation are negatively associated with both peer network loneliness and dyadic loneliness in children. As there is no previous data on the relationship between these specific aspects of empathy and loneliness in children, my hypothesis is exploratory in nature. My research question and hypothesis are as follows:

Research question: Can peer network loneliness and dyadic loneliness predict different components of empathy in children between 8 and 15 years old?

a) Can peer network loneliness and dyadic loneliness predict **affective empathy**?
b) Can peer network loneliness and dyadic loneliness predict **cognitive empathy**?
c) Can peer network loneliness and dyadic loneliness predict **prosocial motivation**?

Hypothesis: Higher scores of peer network and dyadic loneliness predict a lower level of all empathy components.

2 METHODS

2.1 Participants and Procedure

The data used in this study was collected between 2021 and 2022 as part of the "Tunteet läpi elämän" research project (Academy of Finland, 2019–2022). Data collection was conducted in the facilities of Human Information Processing Laboratory at Tampere University. The participants were recruited through email lists and social media platforms, and their caregivers or they themselves signed up through an online form, after which they were contacted by phone to schedule an appointment at the laboratory. The sample used in this study (N=81, 46 females and 35 males) consisted of children and adolescents between 8 and 15 years old (m=10.73, SD= 2.04). The participants filled out both an empathy and a loneliness self-report questionnaire. For children younger than 10 years, the empathy questionnaire was filled out by a caregiver. The participants were all native Finnish speakers, and the questionnaires were thus conducted in Finnish.

Participation in this study was entirely voluntary, and discontinuing or withdrawing one's participation was possible at any point throughout the process. The participants and their guardians were first informed about the study and had the opportunity to ask questions before giving their informed consent. For children aged between 8 and 14, their caregivers consented to the study. In addition, the children themselves consented at the beginning of the study. For 15-year-old adolescents, their own consent was sufficient, but they were also asked to discuss their participation with their caregiver.

2.2 Measures

Empathy was measured using the Empathy Questionnaire for Children and Adolescents (EmQue-CA; Rieffe et al., 2010; Overgaauw et al., 2017). The EmQue-CA consists of a total of 18 items, distributed between the three different components of empathy. Each item is a statement targeting one aspect of empathy, and the responder rates the accuracy of the statement on a three-point scale (Not True – Sometimes True – Often True). The answers were scored correspondingly on a scale 0–1–2, and then a mean score (between 0 and 2) was calculated for each empathy component. The 18 items are distributed as follows: seven items targeting affective empathy (e.g., "If a friend is sad, I also feel sad", $\alpha = .749$), five items targeting cognitive empathy (e.g., "When a friend is angry, I tend to know why", $\alpha = .633$) and six items targeting prosocial motivation (e.g., "If a friend is sad, I want to do something to make it better", $\alpha = .825$). The items are presented in a mixed order in terms of targeted empathy component. As the EmQue-CA is designed to assess empathy in children aged 10 years and older, for participants aged 8 to 9 years their caregivers filled out a parent version of questionnaire instead. This parent questionnaire was fully equivalent to the self-report questionnaire, the only difference was the wording of the questions being directed towards the child (e.g., "When another child is sad, my child also feels sad").

Loneliness was measured with the modified Finnish version (Junttila & Vauras, 2009) of the Peer Network and Dyadic Loneliness Scale (PNDLS; Hoza et al., 2000), which is a self-report tool that measures peer network and dyadic loneliness in children as two separate dimensions. In the Finnish PNDLS there are 10 items in total, five of which target peer network loneliness and the other five dyadic loneliness. The items are presented as paired statements, such as "Some kids feel like they really fit in with other kids *but* Other kids don't feel like they fit in very well with other kids" for peer network loneliness ($\alpha = .763$) and "Some kids have someone their age who is a really close friend *but* Other kids don't have anybody their age who is a really close friend" for dyadic loneliness ($\alpha = .561$). From these paired statements the participants were first asked to choose which of these two types of kids they were most like, and then to rate whether the description fit them "quite well" or "very well". Each item was scored between 1 (very low loneliness) and 4 (very high loneliness), and therefore, for both subscales the minimum score was 5 and the maximum score was 20. All the participants filled out this questionnaire themselves.

2.3 Data Analysis

The data was analyzed using the R statistical software (v4.1.2; R Core Team, 2021). The reliability coefficients of different subscales were calculated using the package *ltm* (Rizopoulos, 2006), multicollinearity was assessed using the package *car* (Fox & Weisberg, 2019), and the results were visualized using the package *ggplot2* (Wickham, 2016). For my research question on whether peer network loneliness and dyadic loneliness can predict the different aspects of empathy, I used three separate linear regression models to analyze this relation for all three empathy components individually. I built the regression models in the following way: peer network loneliness and dyadic loneliness were the explanatory variables in all three models, and each empathy component (affective empathy, cognitive empathy, and prosocial motivation) was set to be the dependent variable in its own model. Multicollinearity was checked using the variance inflation factor, and the explanatory variables did not correlate with one another (*VIF*=1.057). Before building the models, the correlation between age and each empathy component was also assessed, but as age was not related to any of the empathy scores, it was not included in the regression models as a control variable. When assessing the assumptions for linear regression, one outlier was noticed to distort the results. This outlier was then removed from the data before proceeding with the analysis. In addition, the EmQue scores were missing from six participants and the PNDLS scores were missing from four other participants. To not further reduce the sample size by 10 participants, these missing scores were replaced with mean values.

3 RESULTS

3.1 Descriptive Statistics

On average, the participants in this sample scored relatively high within all empathy components. For affective empathy, the participants' scores ranged between 0.43 and 1.86 (M = 1.22, SD = 0.36). For cognitive empathy, the scores ranged between 0.40 and 2.00 (M = 1.52, SD = 0.33). For prosocial motivation, the scores varied between 0.50 and 2.00 (M = 1.60, SD = 0.41). At the same time, the

participants scored relatively low in both peer network loneliness (M = 8.04, SD = 2.93) and dyadic loneliness (M = 7.74, SD = 2.34), with the scores ranging between 5 and 18 for peer network loneliness and 5 and 14 for dyadic loneliness.

3.2 The Relationship Between Empathy and Loneliness

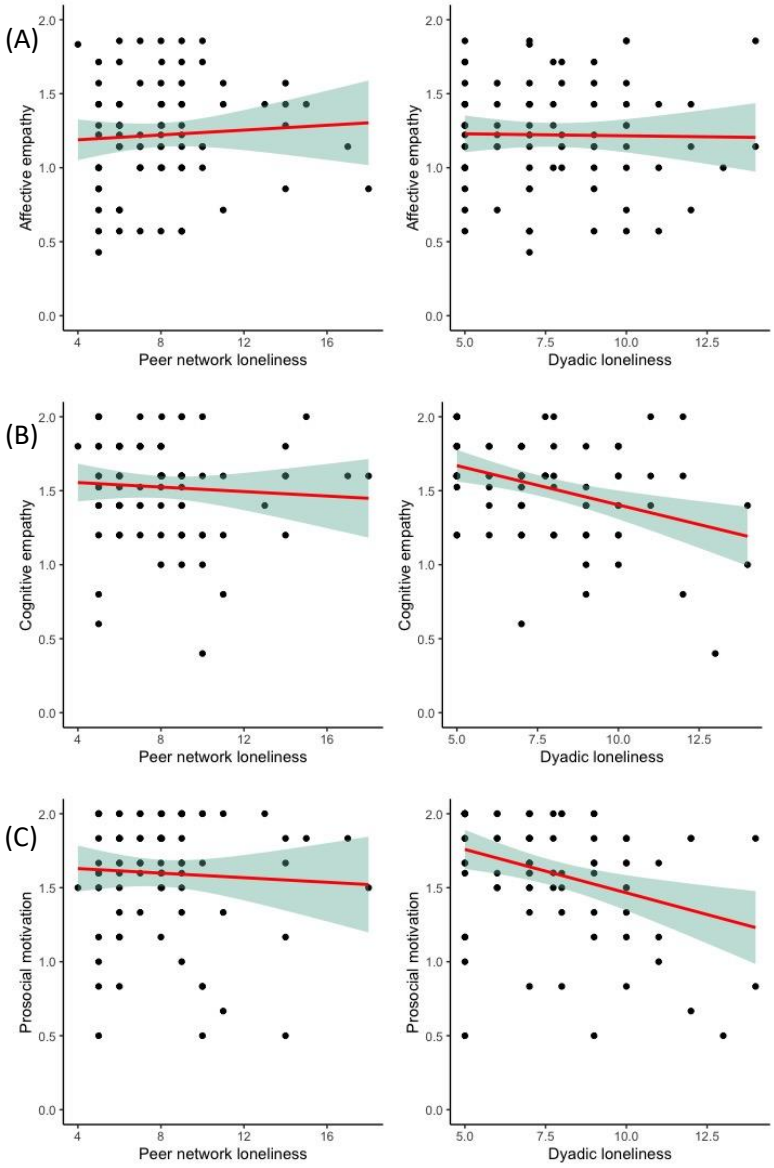
The first model examines the relationship between peer network loneliness and affective empathy, as well as the relationship between dyadic loneliness and affective empathy (Figure 1.A). According to this model (adjusted R^2 = −.02, $F(2, 77) = 0.22$, p = .805), peer network loneliness did not predict affective empathy, β = 0.009, p = .524, and neither did dyadic loneliness, β = −0.005, p = .766.

The second model examines the relationship between peer network loneliness and cognitive empathy, as well as the relationship between dyadic loneliness and cognitive empathy (Figure 1.B). According to this model (adjusted R^2 = .12, $F(2, 77) = 6.19$, p = .003), peer network loneliness did not predict cognitive empathy, β = 0.002, p = .847, but dyadic loneliness did significantly predict cognitive empathy, β = −0.054, p < .001.

The third model examines the relationship between peer network loneliness and prosocial motivation, as well as the relationship between dyadic loneliness and prosocial motivation (Figure 1.C). According to this model (adjusted R^2 = .09, $F(2, 77) = 4.99$, p = .009), peer network loneliness did not predict prosocial motivation, β = 0.003, p = .826, but dyadic loneliness did significantly predict prosocial motivation, β = −0.059, p = .003.

Figure 1

The Relationship Between the Three Components of Empathy and the Two Types of Loneliness



Note. A) Relationship between affective empathy and peer network loneliness and dyadic loneliness. The fitted regression model was: affective empathy = 1.19 + 0.01 * peer network loneliness - 0.01 * dyadic loneliness. B) Relationship between cognitive empathy and peer network loneliness and dyadic loneliness. The fitted regression model was: cognitive empathy = 1.92 + 0.00* peer network loneliness – 0.05 * dyadic loneliness. C) Relationship between prosocial motivation and peer network loneliness and dyadic loneliness. The fitted regression model was: prosocial motivation = 2.03 + 0.00 * peer network loneliness – 0.06 * dyadic loneliness.

4 DISCUSSION

The aim of this study was to examine the relationship between the three different components of empathy and the two types of loneliness in children and adolescents. More specifically, I investigated whether peer network loneliness and dyadic loneliness could predict affective empathy, cognitive empathy, and prosocial motivation. Both loneliness and empathy were measured using previously validated self-report questionnaires, the PNDLS and the EmQue-CA. The data was collected as part of the "Tunteet läpi elämän" research project, and my final sample consisted of 81 participants between the ages of 8 and 15. Based on previous very limited research, my exploratory hypothesis was that higher scores of peer network and dyadic loneliness would predict a lower level of all empathy components. The results showed that cognitive empathy and prosocial motivation, but not affective empathy, were negatively associated with dyadic loneliness. However, the current study found no association between peer network loneliness and any component of empathy. In this section, the findings of this study are discussed further, with a focus on providing potential explanations for the results, examining the limitations of the study, and presenting suggestions for future research in this area.

4.1 The Negative Relationship Between Empathy and Loneliness

The results of the current study suggest a negative relationship between cognitive empathy and dyadic loneliness. This means that children who experienced high dyadic loneliness, a lack of close friendships, tended to score lower on cognitive empathy. This result reflects that of Beadle et al. (2012), who also found a negative connection between cognitive empathy and overall loneliness in adults. At the same time, the results of this study did not reveal a statistically significant connection between cognitive empathy and peer network loneliness. A possible explanation for this is lower cognitive empathy leading to socioemotional challenges that are specific to dyadic friendships. If a child has a low level of cognitive empathy, they struggle to understand others' emotions. This likely leads to difficulties with offering emotional support to others, which can then rather straightforwardly hinder the formation and maintenance of emotionally close friendships. If one feels that their emotions and thoughts are not understood by someone, it is unlikely that they would form and

maintain a close dyadic friendship with this person. At the same time, such deficiency in understanding the emotions and perspectives of others may more easily go unnoticed in group settings and as a part of a social network. Social perspective-taking has consistently been found to predict higher dyadic friendship quality, as determined by, for instance, validation and caring, intimate exchange and conflict resolution (Chow et al., 2013; Smith & Rose, 2011; Soenens et al., 2007). Correspondingly, Meuwese et al. (2017) found cognitive empathy to be significantly correlated with quality of dyadic friendships, but neither likeability nor perceived popularity as rated by peers.

The results of this study similarly demonstrated a negative association between prosocial motivation and dyadic loneliness, but not peer network loneliness. Thus, children who experienced higher dyadic loneliness tended to score lower on prosocial motivation, but the same connection was not found for peer network loneliness. As for cognitive empathy, the explanation may be found in the different nature of dyadic relationships and peer network relationships. Prosocial motivation is directly about acting in accordance with one's empathic concern for the other person, thus most often referring to offering emotional support in negatively experienced situations. Peer network relationships most likely require such empathic support skills considerably less compared to close dyadic friendships. Considering that school is the main social environment for children and adolescents, most peer interactions facilitated by this environment are likely quite surface-level and in the context of either classroom discussions or short free periods in between classes. It is also necessary to note that, unlike the widely established concepts of affective and cognitive empathy, the exact definition of this third empathy component still varies. It is generally agreed to be the regulatory mechanism to make the distinction between one's own and others' feelings (Decety & Jackson, 2004), which often leads to empathic concern or helping the person. As Overgaauw et al. (2017) were the first to include this third component in a questionnaire (the EmQue-CA) directly as "prosocial motivation", the tendency to actually support the person one empathizes with, there is no previous research to compare these results to.

The findings differing so significantly based on the loneliness type is particularly noteworthy; while dyadic loneliness predicted two out of three empathy components, peer network loneliness predicted none. This finding reflected a previous proposition by Nangle et al. (2003) that it is especially dyadic friendships that connect to feelings of loneliness more strongly. This is not to say that dyadic loneliness would necessarily be a matter of higher severity, but it is logical that empathy, as a competence related to emotions, is more linked to the emotional dimension of loneliness than it is to the lack of being included in a social network. The PNDLS items that target peer network loneliness measure feelings of inclusion and fitting in within peer networks (e.g., "Some kids feel like they really fit in with other kids" and "Some kids hardly ever feel accepted by others

their age"). Therefore, peer network loneliness is very much about whether a child is included and liked by their peers collectively. Group acceptance and the level of experienced peer network loneliness might thus be more based on general social skills and likeability rather than empathic skills and emotional competencies. While dyadic friendships are based on intimacy, cooperation, and trust, group acceptance is all about how the peer group perceives the child (Gifford-Smith & Brownell, 2003). This perception and the child's sociometric status can largely depend on other things than their socio-emotional skills: for example, athletic and academic ability as well as attractiveness are important determinants of peer popularity (LaFontana & Cillessen, 2002).

Based on the findings of this study, there is no evidence to support the hypothesis that there is a connection between affective empathy and either dyadic or peer network loneliness. My hypothesis of a negative association was based on Beadle et al.'s (2012) finding that emotional reactivity was negatively correlated with overall loneliness in adults, as measured by the UCLA Loneliness questionnaire. The reason for why this same effect was not observed in this study could simply be the small sample size and random variance, or the biased sample; on average, the participants scored rather high for all empathy components and rather low for both loneliness types. Additionally, the difference could also be related to the variation of the items in different empathy questionnaires. Beadle et al. (2012) used the EQ (Baron-Cohen & Wheelwright, 2004), and its factor emotional reactivity refers to emotional contagion equivalent to affective empathy in the EmQue-CA. However, the EmQue-CA items include some rather strong claims (e.g., "When a friend cries, I cry myself" and "If a friend is laughing, I also laugh"), while the EQ keeps to less bold items (e.g., "I get upset if I see people suffering on news programmes" and "Seeing people cry doesn't really upset me"). Although feeling upset when you see a friend cry, or happy when you see them laugh, surely taps into the tendency to have an emotional reaction to others' emotions, it is a much higher requirement for this emotional reaction to go as far as actually crying or laughing oneself. Therefore, it could be that the affective empathy measured by EmQue-CA requires much stronger emotional contagion, which may not play such an important role in social relationships. Alternatively, an explanation for the difference could also be the participants' age; Beadle et al. (2012) studied adults aged between 18 and 81, while the current study explored the same phenomena in children and adolescents.

An explanation may also be found in the nature of affective empathy itself. As affective empathy refers to the similar affective response elicited by another person's emotional display (Decety & Jackson, 2004), it has been found to predict greater affective distress (Powell, 2018). This personal distress has even been described as "the self-focused form of empathy", as it directs one's attention to their own state of distress while excluding attention to the other person's emotions

(Eisenberg & Fabes, 1992, as cited in Smith & Rose, 2011). In the case of affective empathy leading to personal distress, it is also expected to be inversely associated with prosocial behavior; a person experiencing personal distress is likely more motivated to escape contact with the person eliciting this affective state, and thus not help the other person if they can get out of the situation instead (Eisenberg et al., 2013). Correspondingly, emotion regulation seems to be an important moderator for the positive association between affective empathy and experienced personal distress (Powell, 2018). Therefore, it may be that affective empathy likely directs a person to concentrate more on their own feelings and thus does not lead to being present for the other person and offering emotional support. This could especially be the case for children and adolescents, as their emotion regulation skills are still significantly developing compared to adults.

4.2 The Strengths and Limitations of This Study

The key strength of the current study is its exploratory achievement; it is one of the first to provide insight into the connection between empathy and loneliness without needlessly simplifying either one of the phenomena into a unidimensional construct. Although previous research has established two different types of loneliness to exist and empathy to consist of different components, there was no previous data on the relationship between these phenomena in equivalent detail. This study thus had a rather comprehensive approach by specifically investigating both two different types of loneliness and all three different empathy components. Furthermore, this was the first study to investigate the link between these phenomena in children and adolescents, as previously the link between empathy and loneliness has only been studied in adults. The sample also consisted of children of a wide age range from 8 to 15 years old, therefore covering most of the different ages through primary and lower secondary education. In addition, this study used modern self-report measures, the PNDLS and the EmQue-CA, that previous research has deemed to have high reliability and validity.

The generalizability of these results is subject to some limitations. First, as participants were recruited through advertising to parents on email lists and social media, it is likely that the sample selected this way does not adequately represent the target population of Finnish children between 8 and 15 years. The parents that are interested in having their children participate in scientific research tend to be more highly educated themselves and to show interest in this research project specifically, one might be interested in emotions and social skills in general, which could affect the

way they teach children socio-emotional competencies. Compared to validation studies of the used measures (Overgaauw et al., 2017; Junttila & Vauras, 2009), the mean scores of our sample were higher for all three empathy components and lower for both loneliness types. This is likely due to the sample selection not leading to an accurate representation of the population, and the small size of the sample can also play a role.

Second, the internal consistency for some parts of the measures was surprisingly low. For dyadic loneliness, the reliability coefficient (Cronbach's alpha) was only .56. However, in comparison to this study, the PNDLS has previously obtained an alpha of .84 for dyadic loneliness (Hoza et al., 2000), and also the Finnish version of the PNDLS has previously measured alphas between .77 and .83 depending on the age of the participants (Junttila & Vauras, 2009). Likewise, Cronbach's alpha for cognitive empathy was only .63, compared to the original .70 measured by Overgaauw et al. (2017). As both the PNDLS and the EmQue-CA have previously been shown to be valid and reliable measures, the explanation for these weaker reliability coefficients is likely the small sample size.

Third, some choices made during the data analysis can also affect the generalizability of the results. For the younger participants aged between 8 and 9 years old, their caregivers filled out a parent version of the empathy questionnaire as the EmQue-CA is meant for children aged 10 years and older. While analyzing the data, this was not taken into account by, for example, separating the participants into two groups depending on age. The self-report empathy scores and parent-report empathy scores were thus treated as equal, which could affect the validity of the results. Additionally, mean values were used to replace missing EmQue or PNDLS scores for a total of 10 participants. Although this was done in an effort to not reduce the sample size, it does mean that over a tenth of the participants then had either their empathy or loneliness score replaced with a mean value.

4.3 Suggestions for Further Research

Currently, a very limited number of previous studies exist on the link between loneliness and empathy, so considerably more research is needed. Ensuring larger and more representative samples would allow for greater generalizability of results. While the negative association between empathy and loneliness has been established for adults (Beadle et al., 2012; Mwilambwe-Tshilobo et al., 2022), there has been no previous research on this topic in children and adolescents. Thus, larger studies

targeting these phenomena at different ages throughout childhood and adolescence are needed. Comparisons between age groups in cross-sectional studies and especially longitudinal studies could also provide useful information on how the link between loneliness and empathy either changes or stabilizes across different developmental periods. This knowledge could be useful for planning prevention or intervention measures and finding the most optimal timing for implementation.

The results of this study show that assessing loneliness and empathy as unidimensional constructs does not necessarily provide accurate enough information, as findings differed significantly based on the type of loneliness and the component of empathy. Future studies should be conducted without diminishing the multidimensionality of either phenomenon. Considering the found gap in the predicting value of peer network and dyadic loneliness, especially differentiating these two separate dimensions of loneliness should be a point of interest both with children and adults. The studies focusing on loneliness in adulthood most often use the UCLA Loneliness Scale (Russell, 1996), which, despite its high reliability and validity, does not separate the two loneliness types. While different components of empathy are often taken into account in at least some manner, more emphasis should be put on the separate loneliness types to establish a better understanding of the phenomenon.

4.4 Conclusion

This study investigated the relationship between empathy and loneliness in children and adolescents, revealing the limitations of assessing these complex phenomena as unidimensional constructs. Although the study's findings require further research, they suggest that the cognitive and prosocial components of empathy are more closely linked to loneliness, and that the connection seems to exist more specifically between empathy and dyadic loneliness, but not peer network loneliness. These insights could inform the development of prevention and intervention measures to address loneliness and lack of close friends, particularly during childhood and adolescence. Both experienced loneliness in childhood and empathy development in adolescence have been demonstrated to carry long-term effects (Allemand et al., 2014; Harris et al., 2013), and social competencies develop significantly during childhood and adolescence. This time period could therefore be crucial for implementing prevention and intervention measures aiming to reduce loneliness by, for example, increasing relevant aspects of empathy and promoting social skills.

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