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## Peer Interactions in Residential Youth Care: A Validation Study of the Peer Interactions in Residential Youth Care (PIRY) Questionnaire

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### ABSTRACT

Interactions among peers in residential youth care are an important dynamic factor affecting behavioral adjustment and treatment success. Assessment and monitoring of the quality of peer interactions are potentially important for promoting a positive peer culture at the living group, contributing to a positive social climate. However, currently, there are no measures available to assess peer interactions in residential youth care. The present study describes the development, construct validity, and reliability of the Peer Interactions in Residential Youth Care questionnaire (PIRY) in a sample of 345 adolescents (age  $M = 15.45$ ,  $SD = 1.59$ , 44.9% male) in the Netherlands. Confirmatory factor analysis of a two-factor model (peer support and acceptance, and relational aggression) showed a good fit to the data, and internal consistency reliabilities were good for both scales. Partial strict measurement invariance for gender was established, and no significant differences were found between boys and girls on latent factor means. The PIRY can be used in practice to assess and monitor both positive and negative peer interactions in residential youth care at the group level. Implications for research and practice are discussed.

### KEYWORDS

Peer interactions; relational aggression; residential youth care; group climate; group dynamics

### Practice implications

- The PIRY can be used in practice to assess and monitor supportive and negative peer interactions in residential living groups.
- Routine monitoring of the quality of peer interactions in living groups can be used in practice-oriented research.
- Routine monitoring of the quality of peer interactions can contribute to a positive social climate.

Treatment of youth who display psychosocial and behavioral problems sometimes takes place in residential care settings where they receive professional mental health care provided by a team of group workers (Kendrick, 2015; Whittaker et al., 2016). This type of treatment is aimed at providing a safe and stable living environment for youth. The living group in which youth are placed consists of 8 to 10 adolescents, supervised by a team of trained group workers providing group treatment (sociotherapy), constituting the primary social environment of youth placed in residential care. In the Netherlands, approximately 17,000 youth between 12 and 18 years live in institutions for residential care (Leloux-Opmeer et al., 2016).

It is well known that positive peer interactions, such as prosocial and supportive behavior, are associated with positive developmental outcomes, and that negative interactions, such as rejection and bullying, are associated with psychosocial and behavioral difficulties (Rubin et al., 2009). In residential care settings, especially in secure care, youth are often referred for conduct problems and deficits in aggression regulation, which can make it difficult for youth to engage in positive interactions and meaningful relationships with each other (van der Helm et al., 2013).

Interactions among youth are considered to be an important aspect of the social climate in residential youth care (Leipoldt et al., 2019). A positive social climate, characterized by a positive group atmosphere, support from staff, opportunities for growth and absence of repression, is associated with higher levels of treatment motivation and positive treatment outcomes (van der Helm et al., 2018; Eltink et al., 2020; Leipoldt et al., 2019). Leipoldt et al. (2019) found that a positive social climate is positively associated with active coping strategies and less aggressive behavior, bullying, and problems with solving social problems among youth in residential care settings. It is assumed that by providing a safe, structured, and supporting environment, in which a positive peer culture can be established consisting of trust and acceptance among youth, supportive behavior, and absence of antisocial behavior (aggressive behavior and bullying) can contribute to positive developmental outcomes after departure from the institution.

Recent research has pointed out that proper assessment and monitoring of the quality of the social climate can improve treatment efficacy by discussing various aspects of social climate with youth and professionals (Levrouw et al., 2018; Strijbosch et al., 2018). Also, Moore et al. (2019) state that residential care institutions should invest in a positive peer culture because positive interactions among youth in residential care play an important role in prevention of peer violence as well as providing support. However, to the best of our knowledge, no questionnaires are currently available to measure the quality of peer interactions in residential care, specifically focusing on prosocial and antisocial behavior among peers within the living group. The present study describes the development of a brief self-report questionnaire to measure the quality of peer interactions in residential youth care. Routine assessment and monitoring of the quality

of peer interactions in residential youth care can be used in practice-oriented research to promote positive peer interactions at the group, contributing to a positive social climate (Stams & Van der Helm, 2017).

### ***Peer Interactions in Residential Youth Care***

During adolescence, peer interactions become important for the development of identity and morality (Erikson, 1968; Rageliene, 2016), and the formation of intimate relationships and sexuality (Fortenberry, 2013). As adolescents tend to separate from their parents, their relationships with peers, belonging to a peer group, and social status become more important (Nawaz, 2011; Rageliene, 2016). Interactions with non-deviant peers are recognized as an important protective factor against violent and deviant behavior (Bender & Lösel, 1997; Lösel & Farrington, 2012), along with factors such as strong school bonding, a positive school climate, and living in a non-deprived and nonviolent neighborhood. The probability of violence decreases as the number of protective factors increases (a dose–response relationship) (Lösel & Farrington, 2012).

Adolescents placed in residential care spend most of their time in the company of other adolescents. During their stay, positive interactions with other adolescents are often an important aspect of treatment, contributing to treatment aims and rehabilitation into society (Brendto et al., 2007). Social interactions among youth and between youth and staff in residential care can be understood as a series of transactional processes (Sameroff, 2009). For example, failure of youth to engage in positive interactions with each other might result in negative and more restrictive reactions from staff, which may hamper the development of supportive (therapeutic) relationships with staff. Also, youth's perception of staff members as unavailable and unresponsive may result in reluctance to ask for help when faced with bullying (Khoury-Kassabri & Attar-Schwartz, 2014). Subsequently, positive staff–youth relationships might positively affect relationships among youth (Worthington, 2003). When youth perceive staff as emotionally available and responsive to their needs, they will be more inclined to ask for help, for example, when in conflict with peers at the living group. Staff have an important role in fostering a positive peer culture; being emotionally available, sensitive, and responsive, but also providing structure and supervision can prevent negative behavior and bullying among youth (Moore et al., 2019).

The interactions among youth can be seen as a dynamic factor affecting treatment efficacy. First, adolescents showing antisocial behavior may negatively reinforce deviant behavior of their peers through deviancy training (De Haan et al., 2010; Dishion & Tipsord, 2011), which might result in a hostile attitude toward staff members who deliver therapy, negatively affecting both therapeutic alliance and treatment motivation (Roest et al., 2016). Second, adolescents showing prosocial behavior may positively affect treatment

motivation through peer support. Moreover, they may help their peers in practicing what they have learned in treatment. Thus, negative or positive peer interactions may have an effect on both individual and, in particular, group treatment (Brendto et al., 2007). Therefore, for example, the program EQUIP, which has been developed to increase moral development and reduce criminal offending, first of all, aims to build a positive peer group culture as a necessary condition for successful treatment of youth with complex needs, both in schools and residential institutions (Van Stam et al., 2014).

During adolescence, belonging to a (peer) group, being accepted by peers, and support from peers are found to be related to positive psychosocial outcomes (La Greca & Harrison, 2005; Heerde & Hemphill, 2018; Newman et al., 2007). In the literature, sense of group belonging and group identification are recognized as psychological constructs based on social identity theory (Kiesner et al., 2002; Newman et al., 2007; Tajfel & Turner, 1979; Tarrant, 2002). Peer acceptance can be defined as the extent to which peers are liked and welcomed to be part of a group (McDonald & Asher, 2018). Peer support refers to the process of giving and receiving emotional or practical support from shared experiences, in which peers face similar challenges or difficulties (Repper & Carter, 2011; Riessman, 1989). Informal peer support can be seen as a naturally occurring process of peer support (Davidson et al., 1999; Repper & Carter, 2011). The present study focuses on positive peer interactions in terms of youth's behaviors of peer acceptance and informal peer support in the context of residential youth care.

Although fewer studies have been conducted on peer support in residential youth care compared to studies on negative peer interactions, several studies have found that positive peer interactions can be an important protective factor and may prevent problem behaviors during residential treatment. Sekol (2013), Emond (2003), and Wulf-Ludden (2013) found that peers could support each other emotionally and give each other advice, helping each other to achieve their treatment goals. Cardoos et al. (2015) found that social preference (in terms of acceptance by peers) was associated with an increase in prosocial behavior after treatment. These studies indicate that peers can be effective reinforcers because they best understand each other's problems and situations, and that peer acceptance and peer support are beneficial for treatment success.

Studies on peer interactions among troubled youth often focus on negative influences that youth might have on each other. For example, there has been an ongoing debate about the extent to which youth in residential care learn criminal behavior from others during their stay, often referred to as peer contagion or deviancy training (Anderson, 1999; Bayer et al., 2009; Chein et al., 2011; Dishion et al., 1999; Dishion & Tipsord, 2011; Huefner et al., 2009; Weiss et al., 2005; Welsh & Rocque, 2014). Parhar et al. (2008) even argue that

deviancy training in secure residential care hampers positive treatment outcomes so badly that placement is best to be avoided altogether.

Findings from a study by Lee and Thompson (2008) suggest that youth's association with deviant peers during treatment is linked to problem behavior and that some youth may be more vulnerable to deviancy training than others. However, in their study, the majority of youth did not show an increase in problem behavior during treatment. Also, several other studies found that exposure to deviant peers during residential treatment was not related to increase in conduct behaviors (Huefner et al., 2009; Huefner & Ringle, 2012). A recent study by Huefner et al. (2018) in which both positive and negative peer influences in residential care were examined showed that positive peer influences were associated with lower rates of serious problem behavior. Furthermore, negative peer influences had a relatively greater impact on peers' serious behavior problems than did positive peer influences. Moreover, Huefner et al. (2018) found that caregiver experience reduced the impact of negative peer influence, but was not associated with positive peer influence. Other studies also found that caregiver experience, active monitoring, and supervision are important in preventing and reducing negative peer influences (i.e., peer contagion) (Gifford-Smith et al., 2005; Huefner & Ringle, 2012; Moore et al., 2019).

Another negative aspect of peer interactions in residential care settings is the occurrence of aggressive behavior among youth, such as peer violence and bullying (Mazzone et al., 2018; Sekol, 2016). Bullying refers to serious and repeated attacks, whereas peer violence is often episodic and may involve various degrees of severity (Barter et al., 2004; Mazzone et al., 2018). Barter et al. (2004) defined four types of violent peer behavior in residential youth care: physical aggression, nonphysical aggression, verbal attacks, and sexual abuse. Barter (2011) mentions another type of aggression; "non-contact attacks," such as invading personal space and harming personal belongings. Furthermore, several definitions for different aspects of nonphysical aggression are used in the literature, such as "verbal aggression," "indirect aggression," "social aggression," and "relational aggression" (Voulgaridou & Kokkinos, 2015). All definitions are characterized by the intention to emotionally harm others, to induce fear, and to take control over the behavior of others (Barter et al., 2004).

Barter et al. (2004) found that physical aggression was present in situations in which there was competition among adolescents. Also, boys used physical aggression as a form of retaliation to show peers that they can stand up for themselves and to protect themselves from further victimization (see also Anderson, 1999; De Jong, 2007). Nonphysical forms of violence are often used proactively (Merrell et al., 2006). Also, nonphysical violence is often used instrumentally to gain a higher social status within a group, for example, through rejecting and excluding others, or by embarrassing others by

spreading rumors and malicious gossip (Archer & Coyne, 2005; Card et al., 2008; Cheng et al., 2010; Griffin & Gross, 2004; Juvonen & Galván, 2008; Salmivalli, 2010). Of note, nonphysical kinds of aggression seem to have the most negative impact on adolescents' behavior in residential youth care (Barter, 2011; Barter et al., 2004; Bowie, 2010; Krabbendam, 2016). In the present study, we use the term relational aggression to refer to all kinds of nonphysical aggression.

Relational aggression has been found to be embedded in the peer culture in residential youth care (Mazzone et al., 2018). Several studies have found that residential youth care groups are often characterized by a certain level of peer hierarchy and that this hierarchy is part of the peer culture in residential groups (Mazzone et al., 2018; Sekol, 2013, 2016). In this hierarchy, youth at the top exert power over their peers by means of physical strength or manipulation, which increases the likelihood of bullying and make youth more vulnerable to acts of physical and relational aggression, through exclusion of certain group members, and spreading malicious gossip (Barter et al., 2004; Sekol, 2016). The establishment of a hierarchy in residential group care is problematic for peer acceptance and peer support because new youth at the living group can be viewed as a threat to the hierarchy rather than a new group member. Also, a high level of hierarchy fosters feelings of jealousy, distrust, and unsafety among youth.

### ***The Role of Gender in Peer Interactions in Residential Youth Care***

The display of aggressive behavior in groups is different between boys and girls. Boys are more competitive and more focused on establishing physical dominance, whereas girls are more focused on interpersonal concerns (Rose & Rudolph, 2006; Zimmer-Gembeck et al., 2013). Mathys et al. (2013) found that girls' peer interactions in residential youth care were characterized by feelings of insecurity and physical-, relational-, and verbal aggression. Attar-Schwartz and Khoury-Kassabri (2015) reported similar findings, such that girls in residential youth care were more susceptible to indirect (verbal-) violence than boys. Ford et al. (2012) emphasized that relational aggression (e.g., humiliating and rejecting peers) is an important negative coping strategy for girls, although gender differences in the prevalence of relational aggression are usually found to be small (Vagos et al., 2014; Voulgaridou & Kokkinos, 2015).

Peer support is also affected by gender. Girls are more inclined than boys to go to peers for emotional support (Barter et al., 2004). These findings could be explained by Taylor's "tend and befriend" hypothesis (Taylor, 2006; Taylor et al., 2000). Also, women reduce stress more often than men by seeking and giving emotional support. They rely on others in stressful circumstances as a way to reduce stress (Cardoso et al., 2013). Mathys et al. (2013) found girls in residential youth care to be extra receptive for positive (peer-) relationships,

a finding that has also been reported for incarcerated adult females (Slotboom et al., 2011), which can be explained by girl's tendency to engage in interpersonal relationships (Buhrmester & Furman, 1987). Girls' orientation toward engaging in interpersonal relationships might also be associated with deviancy-training through reinforcement of a friend's behavior. De Haan et al. (2010) studied the process of deviant talk in a sample of girls, focusing on deviant (rule-breaking) talk in dyads. De Haan et al. (2010) found that in non-delinquent, delinquent, and mixed dyads, deviant talk occurred through reinforcement of their interaction partner's rule-breaking talk during the conversation.

### ***Measuring Peer Interactions in Residential Youth Care***

Youth's experiences with peers can be measured in different ways, depending on the type of experience, and the level of analysis (Fabes et al., 2008; Rubin et al., 2009). In the present study, we focus on interactions between youth at a group level, by focusing on interactions with their peers at the living group. Several self-report and other-report measures are available to measure interactions with peers (e.g., Social Skills Rating System [SSRS], Gresham & Elliot, 1990; Interpersonal Competence Scale, Cairns et al., 1995). However, these measures focus on individual interpersonal skills and competencies in general and are therefore not suited to assess peer interactions at the group level. To measure the quality of peer relationships, the Network Relationship Inventory (NRI, Furman & Buhrmeister, 2009) may be used, but this measure focuses on interactions at a dyadic level and does not address interactions among youth in a group setting. Furthermore, sociometric methods can be used to assess the sociometric status of youth in peer groups and to gain insight into positive and negative links between group members (Cillessen, 2008). Magalhães and Calheiros (2015a, 2015b) have adapted such measures for use in residential care, which focus on the youth's perception of the group in which they receive treatment during their stay and their sense of group identification. These measures do not focus on interactions among youth at the living group, but rather on perceived attributes of the group to which they belong, based on a social identity framework.

Recently, various measures to assess group climate in residential (youth) care have been developed. Tonkin (2015) identified three questionnaires for use in adolescents in secure facilities: the Correctional Institutions Environment Scale (CIES), the Ward Atmosphere Scale (WAS), and the Prison Group Climate Instrument (PGCI). These measures address peer interactions to some extent. However, none of these questionnaires or any other to our knowledge measure both positive and negative peer interactions in (secure-) residential youth care.



To measure the quality of peer interactions in residential group care by means of a self-report questionnaire, it is important to address positive (prosocial) as well as negative (antisocial) peer interactions, and to take into account the group context by focusing on interactions among peers at the living group. The aim of the present study was to develop and validate a self-report questionnaire that measures positive peer interactions (behaviors indicating peer acceptance, mutual trust, and peer support) and negative interactions (behaviors indicating acts of relational aggression, exclusion and rejection of peers, and deviancy training) in residential youth care. Another aim of the study was to examine measurement invariance for gender, to investigate whether the measure was suitable for both boys and girls.

## **Method**

### ***Participants***

The study was conducted in 12 different organizations that provide residential youth care for adolescents with serious behavior problems in the Netherlands. In total, 609 adolescents were treated at the time of the study. A total of 345 youth participated in the study (response rate of 57%). The sample consisted of  $N = 345$  adolescents (44.9% male,  $M$  age = 15.45,  $SD = 1.59$ ,  $Min = 10$ ,  $Max = 23$ ). Adolescents represented 64 different living groups, and consisted of boys-only ( $n = 34$ , 9.9%), girls-only ( $n = 82$ , 23.8%), and mixed-gender groups ( $n = 228$ , 66.3%). Of the participating adolescents, 162 (47%) were placed in secure facilities and 183 (53%) were placed in open facilities.

### ***Procedure***

Data were collected between March 2015 and January 2016, as part of an ongoing practice-oriented research project on group climate in the participating organizations. The parents or guardians of the participants agreed to the participation of their child or pupil when the child entered the residential facility and the participants were informed about the study through an information letter that was attached to the questionnaire. The adolescents signed an informed consent form prior to filling out the questionnaire. The participants took part voluntarily and anonymously and gave permission that the data could be used for scientific purposes. A research assistant issued the questionnaires to the groups and were collected after the participants completed the questionnaires. In two organizations, the researchers themselves handed the questionnaires to the participants. The adolescents filled out the questionnaire by themselves, without assistance from group workers or researchers. The study met all criteria (such as informed consent,

data storage, and anonymity) as stated in the Netherlands Code of Conduct for Research Integrity (2018).

### **Measures**

Peer Interactions in Residential Youth care questionnaire (PIRY). This questionnaire was developed to measure peer interactions in residential youth care in terms of positive (prosocial) interactions – including peer acceptance, mutual trust, and peer support – and negative (antisocial) interactions – including relational aggression, exclusion, rejection of peers, and deviancy training. The PIRY was modeled after a French measure of group climate developed for justice-involved girls (Questionnaire de Climat de Groupe en Center de Réadaptation [QCGCR], Mathys et al., 2013). Items referring to peer (group) interactions were adapted for youth of both sexes, in particular items of the scale for Peer relation (e.g., “I can ask the girls in my unit for help when I need it” and “I have warm and friendly relationships with the girls in the unit”).

The initial item pool contained 34 items indicative of negative (19 items) and positive (15 items) peer interactions. Examples of negative interactions are threatening of peers, learning deviant behavior from peers, excluding peers during group activities, behaving in a certain way to get accepted by peers, and jealous behavior. Two sample items of this scale are “Adolescents threaten each other here” and “Youth learn bad things from each other”. Positive interactions were, for example, correcting each other when misbehaving, telling secrets to each other, giving each other advice, acceptance of new group members, and making friends. Two sample items of this scale are “We accept each other as we are” and “Other youth try to help me with problems.”

The items are brief statements of low cognitive complexity so that they can be understood by adolescents with mild intellectual disabilities. Items are rated on a 5-point Likert type scale ranging from 1 = “I do not agree” to 5 = “I totally agree.” Face validity of the items was examined through discussion of the items with an expert panel, consisting of three professionals working with youth in residential care as well as six researchers in the field of residential youth care, who gave feedback on the items, specifically whether items would be suitable for boys as well as for girls, and whether the items were suitable for adolescents with a mild intellectual disability.

A total of 18 items of the 34 items were retained. Items were excluded based on content (e.g., items did not refer to interactions among peers), complexity (e.g., items were too long or ambiguously worded), and relevance (e.g., items referring to situations that were not applicable to some institutions). Examples of items that were excluded were “I try my best to be nice to others at the group,” “Since my arrival at the group, other youth have been nice to me,” and “I cannot be myself at the group, others do not accept me as I am.” This

process resulted in a short questionnaire that fits to the limited attention span and cognitive limitations of adolescents in residential youth care. Also, the questionnaire was discussed with youth in several living groups. During this session, youth were asked for feedback on the items. The participants had no problems understanding the items and filling out the questionnaire *Prison Group Climate Inventory* (PGCI). The PGCI was developed by Van der Helm et al. (2011) and consists of 36 items rated on a 5-point Likert scale, ranging from 1 = “I do not agree” to 5 “I totally agree.” The PGCI measures four dimensions of group climate: Repression, Support (from group workers), Growth, and Group atmosphere. Initially, the PGCI was developed for use in prison settings and secure care settings, but an adapted version (referred to as the Group Climate Instrument [GCI]) can also be used in open residential settings. In the present study, the scale Group atmosphere (seven items) was used. This scale measures youth’s perspective of group atmosphere in terms of how adolescents treat and trust each other, feelings of safety toward each other, being able to get peace of mind, and whether there is enough fresh air and daylight. The scale consists of seven items. An example item of the Group atmosphere scale is: “We trust each other here.” Reliability of the scale in the present study was  $\alpha = .80$ .

### **Statistical Analyses**

First, assumptions were checked (missing data and normality). Also, intraclass correlations (ICCs) of the items were computed, to examine the amount of variability between groups, and the degree of non-independence of the data (Raudenbush & Bryk, 2002).

A Confirmatory Factor Analysis was conducted to examine construct validity. Mplus software version 6.11 was used to conduct the analyses (Muthén & Muthén, 1998–2010). A two-factor model was specified in which each item loaded on only one factor. The robust maximum likelihood estimation procedure (MLR) was chosen to estimate the model. Modification indices were used to improve model fit. Items that did not load significantly on their respective factor or cross-loading items were removed from the model. The “type = complex” in Mplus was used to account for nested data (youth clustered within groups) and correct standard errors, using group as a cluster variable. We considered multilevel factor analysis (MCFA) to examine the factor structure at both the within- and between-group level. However, the sample size was relatively small.

Multiple group CFA was conducted to test measurement invariance for gender. We followed the procedures outlined by Van de Schoot et al. (2012). First, an unconstrained model was fitted to examine configural invariance. In this model, factor variances were fixed to 1 and factor means were fixed to 0 in each group for identification, and all item loadings, intercepts, and residual

variances were freely estimated. Next, a model was fitted with loadings constrained to be equal across groups (metric invariance). The factor variances were fixed to 1 in the reference group (boys) and were freely estimated in the other group, while the factor means were held equal across groups. Third, a model was fitted with loadings and intercepts constrained to be equal across groups to examine scalar invariance. In the reference group, the factor variances and means were fixed to 1 and 0, respectively, but freely estimated in the other group. Finally, strict invariance was examined, by holding the residuals equal across groups.

Model fit was evaluated by using the following fit indices; comparative fit index (CFI), Tucker–Lewis index (TLI), the root mean square residual (RMSEA), and the standardized root mean residual (SRMR). Cutoff values CFI >.95, TLI >.95, and RMSEA <.05 are required for good model fit, and CFI >.90, TLI >.90, and RMSEA <.08 are indicative of acceptable model fit (Hu & Bentler, 1999; Kline, 2016). Also, change in CFI ( $\Delta$  CFI) was used to examine change in model fit of multiple group analyses. A change in CFI by .01 or more is indicative of non-invariance between groups (Cheung & Rensvold, 2002).

Reliability analyses (Cronbach’s alpha) were conducted to assess the reliability of the factors.

Finally, concurrent validity was examined by calculating correlations between the factors Peer support and acceptance and Relational aggression, and the scale Group atmosphere of the PGCI. Concurrent validity is demonstrated when Peer support and acceptance correlate positively with the Group Atmosphere scale, and when Relational aggression is inversely related or unrelated to the Group atmosphere scale.

## Results

### *Descriptive Statistics*

Descriptive statistics of all items are depicted in Table 1. Skewness and kurtosis values for all items were within an acceptable range. ICCs ranged between .05 and .25.

### *Construct Validity and Reliability*

A CFA was conducted in which a two-factor model was specified, consisting of Peer support and acceptance (eight items) and Relational aggression (10 items). Initial fit of the model was mediocre:  $\chi^2_{134} = 297.45$ ;  $p < .001$ , CFI = .904, TLI = .890, RMSEA = .059 (90% CI = .050, .069). After deleting three items of the factor Peer support and acceptance (“When youth behave

**Table 1.** Means, standard deviations, range, skewness, kurtosis, and intraclass correlation coefficients of the items.

	<i>M</i>	<i>SD</i>	Range	Skewness	Kurtosis	ICC
Youth threaten each other here	2.63	1.35	4.00	0.31	-1.09	.16
Youth learn bad things from each other	2.89	1.22	4.00	0.03	-0.83	.06
Youth behave tough to get accepted into the group	3.44	1.32	4.00	-0.60	-0.78	.12
Youth gossip a lot here	3.67	1.31	4.00	0.25	-0.85	.25
Youth here are excluded from the group	2.66	1.25	4.00	0.06	-1.09	.10
Someone creates a bad atmosphere	2.95	1.33	4.00	0.25	-1.26	.11
Someone here acts bossy	2.73	1.45	4.00	-0.11	-0.76	.15
Other youth are often in a bad mood	3.03	1.19	4.00	0.13	-1.06	.08
Youth act jealously here	2.81	1.30	4.00	-0.37	-0.94	.05
Youth provoke each other here	3.34	1.32	4.00	-0.42	-0.90	.16
Youth give each other advice on how to deal with problems	3.12	1.23	4.00	-0.26	-0.78	.20
Other youth try to help me with problems	3.03	1.26	4.00	-0.21	-0.94	.15
There is someone here to whom I can tell my secrets	3.23	1.59	4.00	-0.27	-1.49	.10
We make sure that new youth here feel comfortable	3.61	1.20	4.00	-0.66	-0.34	.18
It is easy to make friends here	3.37	1.26	4.00	-0.37	-0.76	.05

disrespectfully, we say something about it,” “At the group, we accept each other as we are,” and “At the group, we discuss relationship problems”) with low factor loadings (<.30), and correlating residual variances of similarly worded items (e.g., “Youth give each other advice on how to deal with problems” and “Other youth try to help me with problems”), the model showed a good fit to the data:  $\chi^2_{87} = 117.51$ , TLI = .978, CFI = .973, RMSEA = .032 (90% CI = .014,.046). Standardized factor loadings ranged from .48 to .66 for peer support and acceptance, and from .56 to .76 for relational aggression.

Reliability was good, with Cronbach’s alpha for “peer support and acceptance”  $\alpha = .72$ , and “relational aggression”  $\alpha = .90$ . The factors were significantly and negatively correlated ( $r = -.242$ ,  $p = .001$ ). These findings imply that both constructs have only 6% of shared variance and can be seen as distinct constructs.

### Measurement Invariance

Next, we tested for measurement invariance for gender (Table 2). A model without constraints across groups displayed a good fit (Model 1: configural invariance). Model 2, representing metric invariance, demonstrated a good fit.

**Table 2.** Fit statistics CFA models PIRY.

	$\chi^2$	df	$p \chi^2/df$	RMSEA	SRMR	TLI	CFI	$\Delta$ CFI
Initial	144.634	87	<.001 1.662	.044	.050	.962	.968	-
Configural	257.087	174	<.001 1.478	.053	.059	.946	.956	-
Metric	265.114	187	<.001 1.952	.049	.062	.953	.958	.002
Scalar	280.437	200	<.001 1.402	.048	.063	.955	.957	.001
Strict	315.875	215	<.001 1.469	.052	.074	.947	.946	.011
Partial strict	300.431	213	<.001 1.410	.049	.070	.954	.953	.004

$\chi^2$  = Chisquare; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

**Table 3.** Means, standard deviations, and differences between boys and girls in relational aggression items.

	Boys ( <i>n</i> = 155)		Girls ( <i>n</i> = 190)		<i>t</i> (df)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Relational aggression	2.92	0.88	3.09	0.98	-1.669 (343)
Youth threaten each other here	2.63	1.27	2.92	1.21	-0.039 (343)
Youth learn bad things from each other	2.85	1.24	3.53	1.29	-0.485 (343)
Youth behave tough to get accepted into the group	3.34	1.35	3.84	1.28	-1.292 (343)
Youth gossip a lot here	3.46	1.32	2.77	1.26	-2.700 (343)**
Youth here are excluded from the group	2.51	1.21	3.05	1.33	-1.966 (343)
Someone creates a bad atmosphere	2.83	1.32	2.84	1.41	-1.544 (343)
Someone here acts bossy	2.59	1.48	3.05	1.17	-1.559 (343)
Other youth are often in a bad mood	2.99	1.22	2.89	1.33	-0.457 (343)
Youth act jealously here	2.70	1.26	3.37	1.29	-1.324 (343)
Youth provoke each other here	3.30	1.35	2.63	1.41	-0.457 (343)

\*\*  $p < .01$ .

**Table 4.** Means, standard deviations, and differences between boys and girls in peer support and acceptance items.

	Boys ( <i>n</i> = 155)		Girls ( <i>n</i> = 190)		<i>t</i> (df)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Peer support and acceptance	3.23	0.85	3.31	0.94	-0.820 (343)
Youth give each other advice on how to deal with problems	3.15	1.20	3.10	1.26	-0.558 (343)
Other youth try to help me with problems	2.99	1.26	3.06	1.26	-0.893 (343)
There is someone here to whom I can tell my secrets	3.05	1.57	3.37	1.60	-1.913 (343)
We make sure that new youth here feel comfortable	3.59	1.13	3.63	1.26	-0.252 (343)
It is easy to make friends here	3.36	1.23	3.37	1.28	-0.091 (343)

The change in CFI ( $<0.01$ ) suggested that there was no significant deterioration in model fit compared to Model 1. Model 3, representing scalar invariance, demonstrated no significant deterioration in model fit across models. Because scalar invariance allows meaningful comparison of latent factor means, we tested differences in mean factor scores between boys and girls, however, no significant differences were found. Model 4, representing strict invariance, indicated significant deterioration in model fit. Partial strict invariance was demonstrated after freeing the residual variances of the items “Youth behave tough to get accepted into the group” and “Youth provoke each other here.”

We also tested for differences between boys and girls on individual items. A significantly higher score was found for girls compared to boys on the item “Adolescents here gossip a lot” ( $t(266) = 2.700, p = .007$ ). Regarding the factor Peer support and acceptance, no significant differences were found.

### Concurrent Validity

To examine concurrent validity, the correlations between the two factors and the scale Group atmosphere of the PGCII were calculated. Both peer support and acceptance ( $r = .402, p < .001$ ) and relational aggression ( $r = -.405,$

$p < .001$ ) were significantly correlated with group atmosphere in the expected direction. These results indicate that a positive group atmosphere is associated with higher levels of peer support and acceptance, and lower levels of relational aggression, respectively.

## Discussion

The purpose of this study was to examine the construct validity and reliability of a self-report questionnaire to assess peer interactions in residential youth care (PIRY). The PIRY was developed as a brief measure to assess both positive and negative peer interactions in residential youth care. The proposed two-factor model (consisting of peer support and acceptance, and relational aggression) showed a good fit to the data. Reliability analyses indicated that both factors had good reliability. Also, partial strict invariance was demonstrated for gender, meaning that the PIRY can be used in boys as well as girls.

Most studies on peer interactions focus on the processes and mechanisms through which youth influence each other's behavior (modeling, differential reinforcement, imitation) (e.g., Burgess & Akers, 1966; De Haan et al., 2010; Sijtsema & Lindenberg, 2018; Thornberry, 1998), or whether youth associate with and develop friendships with peers who display similar behavior (social preference, selection) (e.g., Kornienko et al., 2018; Magalhães & Calheiros, 2015a, 2015b; Tarrant, 2002). Also, studies on peer interactions mostly focus on the negative influences of peers, resulting in deviant or criminal behavior, alcohol/drug use, or school dropout (Dishion & Tipsord, 2011).

The PIRY measures positive peer interactions in terms of peer support and acceptance, characterized by adolescents helping each other, providing each other emotional support, and accepting new group members. These behaviors are indicative of prosocial interactions among peers in the context of residential youth care, which are essential in building a positive peer culture in which youth feel accepted, safe, and in which youth can give and receive emotional and practical support (Brendto et al., 2007; Repper & Carter, 2011). The PIRY also measures negative peer interactions, specifically relational aggressive behavior: excluding peers from the group, gossip, youth acting dominant, and threatening and provoking each other. These behaviors are indicative of antisocial interactions among youth at the living group, and are detrimental to a safe and supporting environment, and may lead to bullying behavior (Barter et al., 2004; Mazzone et al., 2018; Salmivalli, 2010; Sekol, 2016).

By measuring youths' interactions with peers at the living group, the PIRY focuses on an important aspect of the social climate in residential youth care. Several measures that assess social climate are aimed at capturing youths' perception of the overall social climate, in which interactions with peers are embedded in factors such as safety (EssenCes) or group atmosphere (PGCI).

Moreover, the items included in the PIRY address behaviors that have actually occurred, according to youth. Existing scales that measure constructs that are related to peer interactions, such as sense of belonging to a group (peer acceptance) and social preference, are often based on sociometric approaches, such as peer nominations (Cillessen, 2008).

Recently, several measures have been developed to assess aspects of group dynamics in the context of residential care, such as group identification (Magalhães & Calheiros, 2015a) and group perception (Magalhães & Calheiros, 2015b). These measures assess either youth's perception of certain characteristics of the group, which can be ultimately characterized as a positive or negative perception, or youth's desire to belong to the group. The PIRY is therefore a new self-report measure that takes a different approach to measure peer interactions in residential youth care. The PIRY can be used in future research to assess peer interactions in residential youth care.

An important methodological limitation is that we used conventional single-level CFA to examine the factor structure of the PIRY. It can be argued that perceptions of peer interactions vary across individuals, and groups vary in the average level of positive and negative peer interactions. Therefore, multilevel confirmatory factor analysis (MCFA) is required. An important advantage of MCFA is that the factor structure of a measure can be examined at both the within-group level and the between-group level (Muthén, 1994). However, in the present study, the sample size was insufficient to conduct MCFA. Another limitation is that only self-report ratings of peer interactions were used and no other measures of peer support or relational aggression were used; hence, convergent validity of the PIRY scores could not be examined. Finally, due to the cross-sectional nature of the study, it is unclear whether the PIRY can be used to measure positive and negative peer interactions throughout time.

Future studies should focus on examining test re-test reliability of the PIRY by examining the stability of the PIRY scores throughout a short period of time. In the present study, the relation between peer interactions and group atmosphere was examined. Concurrent validity could be further investigated by examining the relation between peer interactions and occurrence of aggressive incidents at the living group. Predictive validity could be established by examining the relation between peer interactions and youth's level of behavioral adjustment at the end of treatment. Future studies should also include data from other sources, such as observational data or information from staff on the quality of the interactions between peers at the living group. By examining quality of peer interactions at the living group from different perspectives, such as staff ratings and observational data (e.g., incident reports), convergent validity of the PIRY can be examined. Furthermore, future research should focus on studying antecedents of peer support in residential youth care, such as youth's sense of belonging and group identification, and factors associated with



transactional processes in the context of residential care, such as support from group workers. Future research should address how these constructs are related to gain a better understanding of how peer support in residential care can be fostered. Limited research is available on this subject compared to negative interactions and aggressive behavior in residential care.

The present study provides preliminary evidence for the construct validity and reliability of the PIRY, which can be used as an instrument to measure both positive and negative peer interactions in residential youth care at the group level. The PIRY can be used in practice-oriented research in residential youth care to improve the quality of the social environment through monitoring positive and negative peer interactions and, subsequently, the provision of continuous feedback to group workers (Stams & Van der Helm, 2017). Results from the PIRY may be used as input for a discussion between staff and youth about how youth experience interactions with their peers at the living group. Group workers in residential care have the important task to nurture a culture in which youth feel safe, accepted, promoting mutual trust, peer support, and healthy peer relationships (Worthington, 2003). It is important that residential youth care facilities undertake efforts to invest in a positive peer culture through which a therapeutic environment can be established, which contributes to positive developmental outcomes of at-risk youth.

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## Data Statement

Raw data were generated at 12 Dutch residential youth care centers. Derived data supporting the findings of this study are available from the first author [JS] on request.

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