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Development and preliminary testing of the Dutch version of the Program for the Education and Enrichment of Relational Skills (PEERS®)

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ABSTRACT

The content of interventions targeting social behavior is sensitive to cultural differences in etiquette and societal customs. Here we describe (1) the process of linguistic and cultural adaptation of the PEERS® social skills program to the Dutch language and culture, and (2) the results from a preliminary adaptation test among 32 adolescents (12–18 years old) with autism spectrum disorder (ASD). Although some important cultural adaptations were made, the similarities in effective social behaviors across cultures were most striking. At post-test, autistic adolescents significantly improved their social skills knowledge. In addition, parent-reported and self-reported social engagement (hosted get-togethers) increased. Also, social skill impairment decreased according to parent-reports. Of the 32 adolescents who completed the program, 31% (n = 10) achieved a clinically significant change on the SRS-2 (ΔSRS-2 > 11.12). Future research examining the effectiveness of the Dutch version of PEERS® should include a larger randomized controlled trial, for which we provide several methodological considerations.

1. Introduction and rationale

The content of interventions targeting social behavior is sensitive to cultural differences in etiquette and societal customs. Widely varying meanings, interpretations and appreciation of social behaviors exist across cultures. While some behaviors are easily understood in one culture, they may be less common or even socially unacceptable in another (Van Widenfelt, Treffers, de Beurs, Siebelink, & Koudijs, 2005). As such, even though an intervention is evidence-based in one culture, this does not mean it works equally well in another culture. The need to translate and adapt interventions in the context of different cultures is also instigated by the need to comply with local care system practices and beliefs (Daley, 2002; Ravindran & Myers, 2012). Consequently, adaptation of

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treatment manuals and evaluation of such interventions is necessary.

The PEERS® parent assisted intervention is considered an evidence-based intervention. Its efficacy was initially established in autistic adolescents (N.B. we use 'autistic' based on the research by Kenny et al., 2015) in the USA for a variety of social-skills (Laugeson, Frankel, Mogil, & Dillon, 2009; Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012; Schohl et al., 2014). PEERS® has since been cross-culturally evaluated in several countries, such as South Korea (Yoo et al., 2014), Israel (Rabin, Israel-Yaacov, Laugeson, Mor-Snir, & Golan, 2018), Hong Kong (Shum et al., 2018), and Japan (Yamada et al., 2020). Interestingly, the cultural adaptations in these cultures were very similar. First, the examples of appropriate social groups, activities, and social networking sites were modified and adapted according to those common in the particular culture. Second, the jokes used in the behavioral rehearsal among adolescents in these cultures were replaced with culturally appropriate examples. Third, examples of local wordings for teasing comebacks, such as 'Whatever…', were incorporated as an appropriate response to verbal teasing. Despite these different customs and linguistic differences among the above-mentioned cultures, once culturally adapted, PEERS® appears to be effective in autistic adolescents.

Although the burgeoning research examining the cross-cultural validation of PEERS® is encouraging, the particular cultural modifications that were made in Korea, Israel, Hong Kong, and Japan are different from those needed in other parts of the world. The PEERS® intervention was not yet available in the Netherlands. Even though the Netherlands is located in the Western Europe region, each country still has quite different cultural etiquettes and societal customs. For example, Dutch people are quite direct in their verbal communication, but quite modest in their non-verbal presentation. Usually, they are also quite private when it comes to inviting people into their home. Therefore, when it comes to the rules described in PEERS®, at the start of get-together, there is no full tour through the home. Also, particular social activities that adolescents often do together in group is cycling to school together. Thus, such particular concrete examples need to be adapted/added to the Dutch manual. Responding to this need for such an adapted program within the Dutch mental healthcare system for autistic adolescents, translation and cultural adaption of the PEERS® intervention was strongly desired in the Netherlands.

The purpose of the current study was to describe the process of linguistic and cultural adaptation of the PEERS® program to the Dutch culture. Given the complex nature of cross cultural treatment validation research, guidelines and recommendations made by Barrera and colleagues were followed (Barrera & Castro, 2006; Barrera, Castro, Strycker, & Toobert, 2012). In line with these guidelines, we will begin by describing the *formative phase* (i.e. the processes of translation and adaptation), followed by describing the results from the *preliminary cultural adaptation test phase*, in 32 cognitively able adolescents, aged 12–18 years, diagnosed with ASD. We hypothesized that these adolescents will show significant positive changes in social skills knowledge, social engagement, and social skill impairment after intervention (Laugeson et al., 2012; Rabin et al., 2018; Schohl et al., 2014; Shum et al., 2018; Yoo et al., 2014).

2. Methods

2.1. Procedures & participants

2.1.1. Recruitment of participants

Data were collected between February 2015 and December 2016. PEERS® sessions were held at two locations of Yulius, a youth mental health institution in the Netherlands. Yulius is a mental health care center and provides, among other services, specialized autism services. Adolescents were recruited from the waiting list of referrals to Yulius in- and out-patient clinics by their coordinating psychologist/ psychiatrist/ pedagogue. After discussion in the multidisciplinary team meeting, potential participants were approached by their coordinating clinician who provided them an information brochure. If they showed interest and agreed to provide their contact information, a trained research assistant contacted them and assessed their eligibility. A total of 43 adolescents were initially recruited and found eligible for pre-assessment. Six adolescents dropped-out of the intervention, due to different personal circumstances, such as problems in the family and/or school situation, while five had incomplete SRS-2 data at pre-assessment. Therefore, 32 autistic adolescents, aged 12–18 years, were enrolled in the preliminary adaptation phase study (66 % male, $M = 14.22$ years, $SD = 1.56$).

Eight groups comprised of three to six participants (either parents or adolescents). Parents and adolescents participated in concurrent sessions within four consecutive 14- week shifts. Participants were assessed at baseline (week 1) and immediately after the 14-week intervention (week 14). Assessments were part of Routine Outcome Monitoring for which they and their parents had consented. Parents and adolescents were informed that they were free to withdraw from these assessments anytime.

2.1.2. The inclusion criteria

(1) Age between 12 and 18 years, (2) enrollment in secondary education, (3) a full IQ and Verbal IQ > 70, (4) a classification of pervasive developmental disorder-not otherwise specified (PDD-NOS), Asperger's disorder, or autistic disorder based on DSM-IV-TR, (5) proficiency in the Dutch language for participants as well as their parents, and (6) motivation to participate in the program and research. The motivation of the participants and their parents was assessed through telephonic screening by a trained research assistant. Exclusion criteria in this study included: (1) a history of major mental illness (e.g., schizophrenia, bipolar disorder, or other types of psychotic disorders), and (2) any visual, hearing or physical impairments that prohibited participation in the intervention.

All participants had an IQ ≥ 80 as this is the policy at Yulius Autism, patients with an IQ < 80 are treated in a different unit. Although the ADOS-2 and 3Di were part of the standard clinical procedure to come to a diagnosis, actual individual scores were not available, since there was no explicit consent to access this diagnostic information from the electronic patient file. Since the

participants were already in their adolescence, their DSM-classification had usually already taken place in their childhood. This was before 2013, when DSM-5 came out, therefore DSM-IV-TR classifications were made and used as an inclusion criterion.

2.1.3. PEERS® intervention

PEERS® consists of fourteen 90-minute sessions, delivered once a week (Laugeson & Frankel, 2010). Parents and adolescents attended separate concurrent sessions that instructed them on key elements about social skills, making and keeping friends as well as handling peer conflict and rejection. Each PEERS® session consists of a didactic lesson, targeting ecologically valid social skills for adolescents. PEERS® teaches the basics of conversation before progressing to more complex social topics, such as initiating contact with groups of peers, hosting get-togethers, and handling arguments and disagreements. In the adolescent group, didactic lessons include video demonstrations, which model inappropriate and appropriate social behaviours. Based on these demonstrations, utilizing Socratic questioning (triggering social cognition), the participants themselves establish rules regarding successful (i.e. ecologically valid) social skills, under supervision of at least one certified PEERS® trainer and a coach (eg. Master level psychology student). These skills are subsequently trained in behavioral rehearsals with performance feedback. Finally, homework assignments, i.e. behavioral exercises to be performed at home and school, are provided at the end of each session to ensure that adolescents apply newly acquired skills in their school environment and extracurricular activities.

In the parent group, the majority of the session is devoted to discussing the previous week's homework assignment. The trainer troubleshoots any problems that arose while adolescents completed the assignment, again ensuring that the acquired skills are successfully applied. The parent trainer also reviews concepts from the didactic lesson, so the parents understand what their adolescent is learning. This allows parents to serve as a social coach for their child (Laugeson et al., 2009). To close each session, adolescents and their parents reunite to schedule the upcoming homework assignment. The parent trainers were a psychologist and a social worker with at least 2 years of experience working with ASD families.

Treatment fidelity was established by the use of a manual by the group leaders. Adherence to this manual was monitored by coaches in both groups, ensuring that each participant received the same instructions and exercises regardless of group. Treatment fidelity was monitored during clinician team (intervision) meetings before and after each session. Treatment compliance with regard to homework completion and attendance were noted during sessions. The participants were only allowed to be absent maximally 2 out of 14 sessions or miss the homework completion maximally 2 times. However, quantitative data of treatment fidelity and compliance have not been collected.

The current study covers a formative phase (phase 1) (Barrera & Castro, 2006) and a preliminary adaptation test phase (PAT; phase 2), the latter includes treatment outcome results. The iterative steps (spirals), illustrated in Fig. 1, describe the process undertaken by our research, development & education (RDE) team as well as the stakeholders surveyed (i.e. users [autistic adolescents, neurotypical peers, parents, teachers] and providers [clinicians]). The results of both phases also provided additional feedback to amend the translation and revise the typos of the Dutch manual.

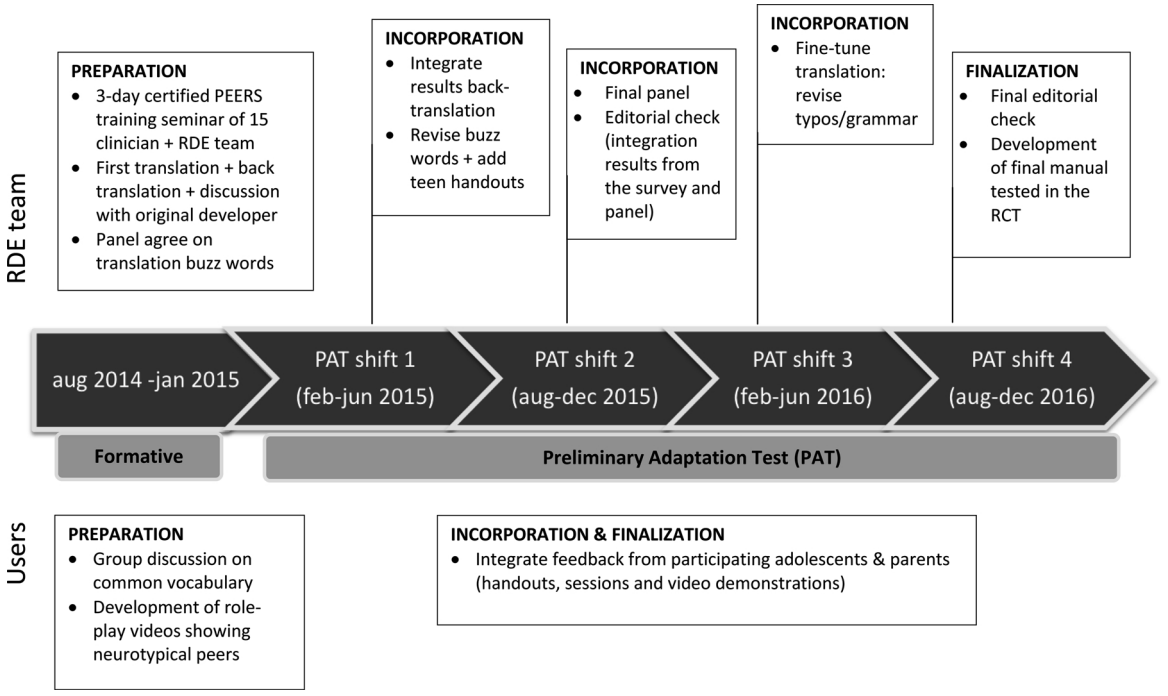

Fig. 1. Overview of the formative phase and preliminary adaptation test (PAT) phases.

Table 1
Cultural adaptations to the Dutch version of the PEERS® treatment manual per session.

Session	Topic	Content	Changes to the Dutch version
1 – 3	Teen activity: Jeopardy	The game	Jeopardy is a well-known game in America, but not in The Netherlands. Therefore, it was replaced by a quiz with questions about the other group members, such as "What is < NAME's > favorite sport?"
3	Choosing appropriate friends	Identifying different peer groups/ crowds	Some American examples of peer groups/crowds are not common in the Netherlands, while others exist that are not mentioned yet. Non-common groups such as cheerleaders, student council kids, choir/ chorus, pep squad, detention club/slackers, wannabe gangbangers/taggers, hippies/granolas/ROTC were replaced by more common groups that were mentioned in focus groups with Dutch adolescents and their teachers, such as smokers, hipsters, farmers, and horse lovers.
4	Choosing appropriate friends	List of recreational and leisure activities as a source of friendship	The list of recreational and leisure activities was not much different from American examples. Yet, activities such as boy scouts and girl scouts were combined because in the Netherlands boys and girls are not separated. YMCA/ YWCA and 4-H were left out because the adolescents were not familiar with these terms.
8	Get together	Beginning of the get-together	The word 'short' was added to the tour at the beginning of a get-together, as it is not common in The Netherlands to give a whole home tour. Usually only the location of living room and toilet are mentioned.
13	Handling rumors and gossip	Strategies for handling rumors and gossip	This didactic is changed regarding structure and content. As for structure, the strategies are first demonstrated (rather than explained) showing the videos that clarify denial (getting upset) versus invalidation (acting amazed/indifferent). As for content, rather than the American formulation of "***acting amazed*** anyone would believe or care about the gossip", in Netherlands, adolescents receive the instruction to "***act indifferent***", so to look unmoved, like they don't care, stay casual, lay low, and avoid drawing attention to oneself.

2.1.4. Phase 1: formative

2.1.4.1. Input from users. To improve the fit between the treatment manual and the local context, the translation and cultural adaptation process was initiated with a survey inventory which was administered to 70 adolescents, aged 12–18 years, and their teachers from special and regular education settings. The aim was to identify common vocabulary used by Dutch adolescents. These adolescents were recruited from secondary schools in the catchment area of Yulius youth mental health services (the province of South Holland). The inventory assessed 14 key constructs from PEERS®, common topics of interest in conversations, locations and methods for making friends, common peer groups and crowds inside and outside of school, activities and pastimes spent with friends, topics of conversations, commonly used applications of electronic communication and social networking, strategies for handling disagreements, and common responses to teasing. Based on the results of this inventory, the original English translation of the manual was modified to create a culturally adapted Dutch version of the PEERS® Treatment Manual. Table 1 provides an overview of the most substantial adaptations.

The most striking cultural adaptation concerned session 13 on handling rumors and gossip. In the US, adolescents are instructed to avoid trying to disprove the gossip, not get upset, or confront the gossiper. American adolescents were asked to ***act amazed*** to show no one would believe or care about the gossip. In the Netherlands, adolescents receive the same didactic (i.e. avoid trying to disprove the gossip, not get upset or confront the gossiper). However, instead of acting *amazed*, they were instructed to ***act indifferent***, like to stay casual, lay low, and avoid drawing attention to oneself. While the expressive non-verbal behavior of acting amazed is prototypical for USA west-coast behavior, less expressive, indifferent behavior is more in line with Dutch cultural mores.

2.1.4.2. RDE team. With the input of the users, the English American version of the PEERS® Treatment Manual (Laugeson & Frankel, 2010) was further translated into Dutch and culturally adapted by a team of 15 mental health care professionals. All professionals were experienced in working with children and autistic adolescents and their parents and received a three-day certified training course on PEERS® by the original developer; dr. Elizabeth Laugeson. Clinicians were involved in several panel discussions to reach consensus on translation and adaptation issues (including the input from the users). A back translation was performed on the handouts, covering the core content of each session. The text in the chapters of the manual was based on these thoroughly translated handouts.

2.1.5. Phase 2: preliminary adaptation test

2.1.5.1. Input from users. To further optimize the manual, adolescents and parents provided regular and immediate feedback through the completion of feedback forms that were distributed and collected at each session. This feedback was incorporated in the handouts, sessions and video demonstration (see Fig. 1).

2.1.5.2. RDE team. A total of 19 professionals (coaches, $n = 10$; clinicians, $n = 9$) involved in the implementation of the PEERS® program then gave their feedback to the translated version. The aim was to elicit their views on the culturally adapted manual, discuss the results of the preliminary adaptation test phase and identify their supervision needs. The treatment team took part in the

feedback sessions. Note-takers (GJ & SJ) transcribed the proceedings and suggestions. Information and suggestions derived from the sessions, which warranted changes to the manual, were discussed in regular RDE team meetings. The results were collated into a comprehensive translation log sheet which included the rationale for the adaptations and were incorporated in the manual. Three independent translators (GJ, SJ & KGL), who were the coordinators of the RDE team, carried out the reconciliation and final editorial checks. Substantive changes and concerns were discussed in video meetings and through e-mails with the original developer, which resulted in an optimized, adapted Dutch PEERS® manual. At the conclusion of two additional cycles of the adaptation test phase, a final editorial check was completed to eliminate any remaining inconsistencies. Apart from these changes, the overall structure and components of each training session were maintained.

Below, we elaborate on the measures administered to parents and adolescents pre- and post-intervention to assess treatment outcome. Parents and adolescents completed the questionnaires on paper, while clinicians were available to answer any questions. The data was collected on site by a trained research assistant.

3. Measures

3.1. Social skills knowledge

The *Test of Adolescent Social Skills Knowledge* (TASSK: Laugeson & Frankel, 2010) is a criterion-based measure. It consists of 26 items, which assess participants' knowledge of the specific social skills that are taught during the PEERS® program. The test includes sentence stems related to the didactic lessons. Adolescents are asked to choose the best option from two possible answers. The items were derived from key elements of each of the 13 didactic lessons. Scores range between 0–26 with higher scores reflecting a higher level of knowledge regarding adolescent social skills. The test is sensitive to PEERS® treatment effects and has a Cronbach's alpha of 0.56 (Laugeson & Frankel, 2010). The relative low Cronbach's alpha was due to the large domain of questions in the scale (Laugeson & Frankel, 2012). The English version of the TASSK was translated into Dutch, back-translated into English by a bilingual translator and then reviewed and edited again by the Dutch PEERS® research group. The Cronbach's alpha for TASSK in the current study is unfortunately not available, since clinicians only entered total scores in the data file.

3.2. Social engagement

The *Quality of Socialization Questionnaire* (QSQ: Laugeson & Frankel, 2010) is a 12-item self-report and parent-report measure to assess the frequency of the adolescent's hosted and invited get-togethers with peers over the previous month, number of peers involved, and the level of conflict during the most recent get-together. Hosted get-together means that the adolescent with ASD invites someone to their own home, while invited get-together means that the adolescent with ASD gets invited by a peer. The test was developed through factor analysis on data of 175 boys and girls (Laugeson et al., 2009). The QSQ was translated to the Dutch language by (GJ), back-translated (expert), reviewed (KGL) and optimized (GJ). We added the phrase 'face-to-face' for the hosted and invited get-togethers to rule out digital get-togethers, which were not the primary target of the intervention. For our current sample, the QSQ-A has a Cronbach's alpha of 0.45 and the QSQ-P has a Cronbach's alpha of 0.61. The low Cronbach's alpha was caused by an adaption of the questionnaire halfway through the pilot. Participants understood the question-topic of 'meeting with peers' differently; some participants understood it as meeting face-to-face and outside of school, while others also considered meeting at school after class as a meeting or online facetiming/Skype as 'meeting'. This confusion was clarified in the introduction text of the questionnaire some time halfway the pilot.

3.3. Social skill impairment

The *Social Responsiveness Scale*-2 (SRS-2; Constantino & Gruber, 2012) is a 65-item autism screening questionnaire. It assesses social responsiveness on a 4-point Likert scale ranging from 0 (not true) to 3 (almost always true). Total scores range from 0 to 195 with higher scores indicating greater severity of social impairments related to ASD (Constantino & Gruber, 2012). The SRS-2 is completed by parents and is used for children aged 4–18 years, providing information for specific behavioral domains including social awareness, social cognition, social communication, social motivation, and autistic mannerisms. In contrast to the TASSK and QSQ, we used the already existing Dutch translation of the SRS-2. Consistent with the validation studies in other countries, the Dutch version of the parent reported SRS-2 demonstrated high internal consistency (Cronbach's alpha ranged from 0.92 to .95), and good convergent validity ($r = .63$ with the ADI-R; Roeyers, Thys, Druart, De Schryver, & Schittekatte, 2011). For our current sample, the SRS-2 has a Cronbach's alpha of 0.98. In the present study, the total cut-off score of 75 on the parent-reported SRS-2 was used to calculate the RCI, which will be further explained in the statistical analysis section. It was not regarded as an inclusion criterion.

3.4. Statistical analyses

To investigate differences on the TASSK, QSQ and SRS-2 between pre-treatment (T1) and post-test (T2) outcome measures, paired-sample *t*-tests were used. A *p*-value of ≤ 0.05 was considered significant. Also, Cohen's *d* effect size was determined. SPSS version 22.0 (SPSS, Inc., 2013) was used for these analyses. Subsequently, in order to examine whether individual changes in SRS-2-total scores were clinically significant (i.e. large enough to be interpreted as meaningful and useful for the participant, parents and clinicians), we used the reliable change index method (RCI) (Jacobson & Truax, 1991) via a computer program (Excel worksheet)

Table 2
Mean score, standard deviations, and statistics on the outcome measures pre- and post-test (n = 32).

	Pre-test			Post-test					
Outcome	*M*	*SD*	*Range*	*M*	*SD*	*Range*	*d*	*t*	*p*
TASSK	16.63	2.48	12 – 20	23.23	2.21	17 – 26	−2.1	−11.53**	< .001
Adolescents									
QSQ (Host)	1.39	1.73	0 – 6	3.16	3.06	0 – 15	−0.7	−3.95**	< .001
QSQ (Invited)	1.11	1.89	0 – 9	1.07	1.25	0 – 5	0.02	0.11	0.91
Parent									
QSQ (Host)	0.90	1.33	0 – 6	2.84	2.72	0 – 15	−0.9	−4.85**	< .001
QSQ (Invited)	1.00	1.58	0 – 8	1.10	1.11	0 – 4	0.06	−0.36	0.72
SRS-2-Total	78.69	14.18	52 – 126	66.59	16.75	15 – 108	0.7	3.92**	< .001
Social Awareness	47.13	26.86	5 – 79	44.69	25.80	1 – 79	0.2	1.16	.25
Social Cognition	54.50	27.61	9 – 94	52.69	29.15	3 – 92	0.2	1.05	.30
Social Communication	60.69	23.94	12 – 98	52.66	23.62	1 – 82	0.8	4.78**	< .001
Social Motivation	55.47	28.44	9 – 91	47.88	25.11	1 – 76	0.8	4.61**	< .001
Autistic Mannerisms	53.63	28.90	8 – 98	49.84	31.09	1 – 94	0.3	1.95	.06

Note: TASSK = Test of Adolescents Social Skills Knowledge; QSQ = Quality of Socialization Questionnaire; SRS-2 = Social Responsiveness Scale.

designed by Morley and Dowzer (2014). We entered the SRS-2 pre-and post-test total scores in an Excel worksheet (Morley & Dowzer, 2014). Then, we entered data about the measure (i.e. mean, SD and range of scores from both clinical data and typically developing norm data cut-off scores). The results of 'Change Score', 'Reliable Change' and Clinically Significant Change' were computed automatically. Data are available upon request. In this RCI calculation, we used as reference scores the mean and SD of the SRS-2-parent from a large Dutch clinical sample (Duvekot, van der Ende, Verhulst, & Greaves-Lord, 2015) that included clinical participants from a similar background (i.e. specialized mental health care referrals from the south-west of the Netherlands). This mean clinical score was 88.78 with an SD of 29.42. The comparison mean and SD of 32.59 (21.39), and the clinical cut-off (total raw SRS-2 score of 75) were obtained from the Dutch SRS-2 manual. The clinical group consisted of participants who have a clinical ASD diagnosis (Duvekot et al., 2015) while the comparison group consists of typically developing adolescents (Roeyers et al., 2011). Based on this information, the RCI value of 11.12 was calculated. For each adolescent, SRS-2 change scores were computed by subtracting pre-test scores from post-test scores (ΔSRS-2) and change scores that were larger than the RCI value 11.12 were considered a clinically significant change.

4. Results

4.1. Phase 2: Preliminary adaptation test phase

Table 2 presents the mean, standard deviation and *t*-score for each outcome measure. Results demonstrate significant improvement in *social skills knowledge* on the TASSK following treatment (t_{29} = -11.53, $p < .001$). With regard to *social engagement* on the QSQ, adolescents and parents both reported a significant increase in hosted get-togethers (t_{30} = -3.95, $p < 0.001$; t_{30} = -4.85, $p < .001$). There was no significant change in invited get-togethers for both adolescents and parents (see below). The difference in total SRS-2 score between pre- and post-test revealed that parents reported improvement after treatment in adolescents' *applied social skills* (t_{31} = 3.92, $p < .001$). Further analysis of subscales revealed significant improvements in the specific areas of *social communication* (t_{31} = 4.78, $p < .001$) and *social motivation* (t_{31} = 4.61, $p < .001$), but no significant changes were observed on the other three subscales.

Age and sex were not correlated with any of the outcome measures and were therefore not considered in the analyses.

To determine whether an adolescent's improvement is 'clinically relevant' the reliable change index (RCI) was calculated (see method). This RCI was 11.12. Of the 32 adolescents who completed the program, 31.3 % (n = 10) showed a positive clinically significant change (i.e. a drop in the SRS-2 score of more than 11.12 points) on the SRS-2, of which n = 7 crossed the clinical cut-off score (of SRS-2 = 75), n = 2 did not meet this ASD cut-off score at pre-test, and n = 1 had score above 75 at pre- and post-test. Of the remaining 22 (32 − 10) adolescents, 21 adolescents showed no clinically significant change (a drop or rise of less than 11.12 points on the SRS-2), Finally, one participant showed a clinically significant deterioration (i.e. a rise of more than 11.12 points on the SRS-2).The reliable change index (RCI) graph and an accompanying table can be found in Appendix 1.

5. Discussion

Based on the existing literature (Laugeson et al., 2012, Laugeson et al., 2009; Mandelberg et al., 2014; Schohl et al., 2014), the PEERS® intervention may be considered a well-established evidence-based intervention to improve social skills in adolescents. However, testing the efficacy of PEERS® in different cultural contexts is vital, due to the varying meanings and interpretations of social behaviors across cultures. This paper describes the process of linguistic and cultural adaptation of the PEERS® program to the Dutch culture and the results of a preliminary adaptation test in 32 adolescents aged 12–18 years who were diagnosed with ASD. Intervention outcomes were assessed through parent and self-report questionnaires.

The cultural adaptations of PEERS® to the Dutch culture included a) examples of appropriate social groups/activities/social networking sites, b) examples of jokes, and c) local wordings for teasing comebacks. These adaptations are very similar to those made for other cultures, such as Korea, Israel, Hong Kong, and Japan (Rabin et al., 2018; Shum et al., 2018; Yamada et al., 2020; Yoo et al., 2014). Although a particular cultural adaptation in the skills of handling rumors and gossip was made, successful social behavior is strikingly similar between the Netherlands and various other cultures (i.e. USA, Korea, Israel, Hong Kong and Japan). Possibly, this is because, from an evolutionary perspective, the need to properly deal with social challenges is even older than mankind: also other primates than humans show similar social behaviors to test and tackle social challenges (De Waal & Johanowicz, 1993). Therefore, PEERS® likely tackles natural behavior that has proven to be effective across ages and cultures, rather than culturally specific or desired behaviors, which could be less effective to endure social pressure (i.e. bullying).

Results from the preliminary adaptation test phase indicated that after treatment, adolescents significantly improved social skills knowledge, social engagement (hosted get-together) and social responsiveness; the latter being specifically related to improved social communication and social motivation. Additionally, almost one-third of adolescents (31.3 %) demonstrated clinically significant change in social skill impairment. Reports by parents suggested generalization of behavioral gains to the home setting. The parents helped their child to make the translation from abstract rules learned in the sessions to concrete behavioral changes in daily life, since the parents learned to act as social coaches outside the clinical setting. However, not all of the SRS-2 subscales demonstrated improvement after 14-week following treatment. Possibly, with continued performance feedback and reinforcement through parent coaching, these subscales may demonstrate significant treatment gains over the longterm. In fact, 14-weeks after treatment, additional treatment gains have been reported in previous studies, showing decreased parent-reported problem behaviors and improved teacher-reported social skills in the classroom (Laugeson et al., 2012).

Although the current study findings are promising, they must be interpreted in light of several limitations. First, this was not a controlled study, so effects cannot definitively be attributed to PEERS®. To evaluate the efficacy of Dutch PEERS®, a randomized controlled trial design, including a delayed treatment control group or an alternative active treatment group, would be highly desirable. Second, even though the initial improvements in social knowledge, social engagement, and social skill impairment are encouraging, it would be interesting to see how these changes are maintained following the intervention, and moreover, if other gains develop over time. Therefore, future research on Dutch PEERS® might examine maintenance of treatment gains as well as new treatment effects months to years following the intervention, as has been done with the original English version (Mandelberg et al., 2014). Third, this study included a very specific and relatively small group of participants, i.e., autistic adolescents who were - often already as a child - referred to one specific highly-specialized mental health care center. Participants were therefore classified according to DSM-IV-TR criteria, so although the ADOS-2 and 3Di were part of the current diagnostic procedure, they did not have to meet the thresholds of these instruments to be eligible for the current study. This might explain why certain participants had relatively low SRS-2 scores at pre-assessment. The findings should therefore not be generalized to the larger ASD population. Finally, using only self- and parent-reports as outcome measures may have led to biased reporting, given the fact that both adolescents and parents were participants in the treatment. Therefore, using teacher reports as well as using an independent behavioral observation of adolescent social behavior is recommended for future studies. For example, an observational assessment like the Contextual Assessment of Social Skills (CASS: (Ratto, Rupp, Penn, Turner-Brown, & Mesibov, 2011) may provide a useful tool to determine whether social skills targeted in the intervention generalize beyond the treatment context.

To summarize, despite linguistic and cultural differences, the PEERS® social skills intervention appears to be suitable for autistic adolescents in the Netherlands after minor adjustment for practical cultural differences. The current findings shed light on the significant positive impact the Dutch version of PEERS® may have on improving the social skills knowledge, social engagement, and decreasing in social skill impairment of Dutch autistic adolescents. Although we seek to further scrutinize the effectiveness of the Dutch version of PEERS® using more rigorous methodology, this study suggests that PEERS® might provide autistic adolescents and their parents the knowledge and skills needed to be more socially effective and successful.

Declaration of Competing Interest

Dr. Laugeson receives royalties from Routledge for sales of the PEERS® treatment manual. The other authors have no conflicts of interest to disclose.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.rasd.2020.101629.

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