

**Candidacy for conversation partner training in aphasia:
findings from a Dutch implementation study**

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Candidacy for conversation partner training in aphasia. Findings from a Dutch implementation study

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Abstract

Background: Aphasia rehabilitation should comprise a family-centred approach, involving main conversation partners in the rehabilitation process as soon as possible. A standardised approach to conversation partner training (CPT) became available in the Netherlands with the release of Partners of Aphasic clients Conversation Training (PACT). PACT was introduced in clinical practice in a multicentre implementation study with 34 participating dyads.

Aims: To explore candidacy for CPT by describing the characteristics of dyads where the conversation partner engaged in CPT and to identify which characteristics had the potential to predict benefit of PACT.

Methods & procedures: A multicentre study with pre-post treatment design. Pre and post CPT measures of psychosocial characteristics (caregiver burden, depression, coping) from the partner and behavioural characteristics (cognitive, linguistic and communicative) from the person with aphasia were collected. Partner experience was assessed using four scales from the Intrinsic Motivation Inventory and a generic satisfaction rating (1-10). Pre-post measures were analysed using paired T-tests and Wilcoxon signed ranks tests. Multiple regression analyses were used to assess potential predictors of training outcomes.

Outcomes & results: Partners of people with moderate to severe aphasia engaged in PACT when it was first introduced in clinical practice (N=34 dyads). Mean time post onset was 11.5 months. Partners enjoyed the practical training in which they actively engaged through experiential learning methods. Partner scores increased significantly over the intervention time on task-oriented and avoidance-oriented coping skills and their symptoms of depression lowered significantly. Caregiver esteem was found to be a positive predictor of feelings of

competence and enjoyment with the training. Older partners enjoyed the training less. More effort was given to the training by the partner when the aphasia was more severe.

Conclusions:

This study underlined the importance of partner characteristics, such as motivation, coping style and a positive outlook on caregiving as possible selection criteria for conversation partner training.

Keywords: Aphasia, conversation partner training, intrinsic motivation, coping, caregiver esteem

Introduction

Over the last few decades a family-centred approach has been advocated as part of the treatment of stroke survivors (Howe, Davidson, Worrall et al., 2012; Visser-Meily, Post, Gorter et al., 2006). Carers experience physical and mental fatigue over the longer term (Lutz & Young, 2010; Van den Heuvel, Witte, Schure, Sanderman, & Meyboom-de Jong, 2001) and lives are “turned upside down” (Bulley, Shiels, Wilkie, & Salisbury, 2010, p.1406). As well as patient characteristics, such as aphasia severity (Michallet, Tétreault, & Le Dorze, 2003) and cognitive dysfunction (Beckley, Best, Johnson et al., 2013), it is the characteristics of carers themselves, such as their coping style, mood, anxiety, and the kind of social support they experience (McGurk, Kneebone, & Pit ten Cate, 2011; Visser-Meily, Post, v.d. Port et al., 2009) which are associated with the carer experience. Visser-Meily et al. (2006) differentiated the needs of carers by outlining different roles, each with their own requirements; as caregivers, as clients themselves and as partners. There has been a particular focus on their caregiving experience (Lutz & Young, 2010). When aphasia is involved carers experience greater burden linked to role changes than carers of stroke survivors without

aphasia. They experience difficulties in communicating with their spouse, reduced social life and marital problems (Bakas, Kroenke, Plue, Perkins, & Williams, 2006; McGurk & Kneebone, 2013). Providing care negatively influenced the life situation of carers (Franzen-Dahlin et al., 2008) who perceived a great need for assistance by their spouse with aphasia, in particular in situations involving communication.

Their role as partners may become more prominent in the chronic stage of stroke, when the early disruption of family life is overcome and the active hope for recovery (Bright, Kayes, McCann, & McPherson, 2013) has been replaced by a need to evaluate and adjust roles within the partnership (Blom-Johansson, Carlsson, Östberg, & Sonnander, 2012; Michallet et al., 2001). For carers of PWA it may be even more challenging to fulfil their partner role as shaping a relationship is closely linked with communication skills (Lock, Wilkinson, & Bryan, 2001). Conversation partner training (CPT) can help partners to cope with some of the challenges they face by increasing awareness of strategies they already use and by learning new strategies. Stroke related information and training in practical tasks was found to assist partners to cope more effectively with their new life situation (Quinn, Murray & Malone, 2014). Although some partners show a reluctance to engage with CPT for themselves (Hilton, Leenhouts, Webster, & Morris, 2014), as they may not perceive themselves as clients to rehabilitation services (Le Dorze & Signori, 2010) and prefer instead to keep aiming for language improvement in the PWA (Blom-Johansson et al., 2012).

The relationship between the need for CPT and characteristics of the PWA has not been studied explicitly. The review on CPT (Simmons-Mackie, Raymer, Armstrong, Holland, & Cherney, 2010) involved different levels of severity in the participants, ranging from mild to severe aphasia. CPT is often described in couples where some language ability is preserved (Beeke, Beckley, Johnson et al., 2015; Saldert, Backman, & Hartelius, 2013; Sorin-Peters, 2004; Wilkinson, Bryan, Lock, & Sage, 2010). Some studies have indicated a need for partner

education in couples where the person with aphasia is severely affected (Michallet & Le Dorze, 2001; Michallet, Tétréault, & Le Dorze, 2003). The majority of the PWA described in these studies were in the chronic stage.

Timing intervention provision is an issue in rehabilitation practice, where professionals need to prepare clients and carers for self-management of their chronic condition within a short time frame. The optimal timing of CPT is largely unknown, as studies describing the education needs of carers are often conducted retrospectively (Hilton et al., 2014), compromising the accuracy about timing. Recent studies of the clinical application of CPT programmes use different times post onset, with some indication that more success is reached in the chronic stage (Sorin-Peters & Patterson, 2014) than in the early stages of recovery (Blom-Johansson, Carlsson, Östberg, & Sonnander, 2013). The latter study described two partners who seemed not to be interested in discussing conversations whereas a third partner did engage with the training, from which the authors concluded that an individual approach was needed.

Other criteria for candidacy were a motivation to change and viewing conversations as a collaborative act (Turner & Whitworth, 2006) and the learning style of partners (Sorin-Peters & Patterson, 2014). When learning new behaviour, intrinsic motivation was judged to be a positive asset for integrating the behaviours that are volitional and related to someone's personal goals (Deci, Eghrari, Patrick, & Leone, 1994). Intrinsic motivation was associated with better learning, performance and well-being and it was maintained by satisfying the need to be competent and autonomous (Deci & Ryan, 2000). Allowing CPT candidates to explore different ways of improving conversations and respecting the choices they make, may foster feelings of both competency and autonomy. Experiential learning (Kolb, 1984) provided a good starting point for CPT (Beckley et al., 2013; Sorin-Peters & Patterson 2014) and has

been used within the Supporting Partners and People with Aphasia in Relationships and Conversation-package (SPPARC; Lock et al., 2001).

It is not only the characteristics of the PWA and their partners which affect uptake of this training; the skills, attitudes and beliefs of rehabilitation professionals have also been responsible for the disparity in care needs and care provision (Hallé, Le Dorze, & Mingant, 2014; Manders, Mariën, & Janssen, 2014). For instance, SLTs may not stress enough the basic concept of communication as a collaborative act and a two-way process, as a prerequisite for equal conversation partners and touching on the partner role of carers (Blom-Johansson et al., 2012; Howe et al., 2012).

Another reason for SLTs not providing training to partners is their lack of tools to work on partner goals (Hallé et al., 2014; Johansson, Carlsson & Sonnander, 2011). Certainly, a standardized instrument which was tailored to individual needs during treatment sessions has been helpful in promoting CPT in rehabilitation practice in the Netherlands (Wielert, v.d. Sandt-Koenderman, Dammers, & Sage, 2014). The “Partners of Aphasic clients Conversation Training” (PACT, Wielert & Wilkinson, 2012), the Dutch adaptation of SPPARC, provides a standardized and theory-driven approach, based on conversation analysis and uses experiential learning as the learning strategy. Goals for the training are derived from videos made by the PWA and the partners (dyads) themselves of conversations occurring in everyday, natural settings. The aims of PACT are to raise awareness in partners of their conversation style, to enable them to actively seek out alternative strategies and to train their use in conversations in natural settings. PACT was introduced in clinical practice within an implementation study (ImPACT) in nine rehabilitation facilities across the Netherlands. The aims of the current study are to describe the characteristics of the dyads where the partner engaged in CPT and to identify which characteristics have the potential to predict who may benefit from the training.

The following research questions regarding characteristics were formulated:

1. What are the psychosocial characteristics of the conversation partners who engage in conversation training with PACT and do these characteristics change over the training time?
2. What are the behavioural characteristics (linguistic, cognitive and communicative) of the persons who have aphasia and can improvement be observed over the training time of their conversation partner?

The following research questions regarding benefit of the training were formulated:

3. Does PACT contribute to change in conversational behaviour of this group of dyads?
4. What is the experience of the partners with PACT?
5. What is the satisfaction of the partners with PACT?

The last research question addresses candidacy for CPT by predicting benefit associated with dyad characteristics:

6. Which partner and/or patient characteristics predict benefit from PACT?

Method

This pre-post treatment design study is part of a larger clinical multicentre study which explored the implementation of PACT in rehabilitation practice (Wielaeert et al., 2014). The speech and language departments of nine rehabilitation facilities participated in the study.

Participants

Candidates for PACT were recruited during the implementation period (May 2012-June 2013) by SLTs from their regular caseload in nine rehabilitation facilities, using the following eligibility criteria:

- PWA to be a minimum three months post onset;

- No severe concomitant cognitive disorders in the PWA;
- Conversation partner (a family member or friend, involved in the rehabilitation process and care of the PWA) who is available and willing to engage with training;
- Dutch as the primary language in daily conversations;
- No suspected or confirmed dementia or psychiatric disorders in either partner or PWA;
- No suspected or confirmed relationship problems that might have affected their communication.

Procedure

The procedures followed to address the research questions are described first, followed by a description of the materials used.

After the dyad signed the consent forms, they used a digital camera supplied by the SLT department to record a number of conversations in their home setting. Biographical data on partners were collected before training and partners completed questionnaires on caregiver burden, risk for depression and coping skills before and after the training. All forms and questionnaires were self-administered (Research Question 1). For PWA, biographical data, time post onset and an activities-of-daily-living score were collected by their SLTs prior to partner training. They were assessed before and after their partners' training with linguistic, cognitive and communicative tasks by the research coordinator (SW) or research assistant, to gain a complete picture of their impairments and abilities relevant for conversation (Research Question 2) and to check for recovery that might also contribute to improvement in dyad conversations. The local SLT formulated a treatment plan in collaboration with the dyad, based on their pre-PACT videos. The number of sessions was planned in collaboration with the partner, although initially for implementation and planning purposes five to six sessions were suggested. Dyads made videos of conversations in their home setting again after the

training. The pre- and post-videos were used to measure change in conversation with an experimental measure (Research Question 3). The partners' experience and satisfaction with the training were measured after the training (Research Questions 4 and 5). Quantitative data from client characteristics measures and the partners' experience were used in a regression analysis to predict factors for candidacy for CPT (Research Question 6).

Materials

The choice for assessments of the partner was informed by the Dutch clinical guidelines for informal carers in stroke care (Visser-Meily & van Heugten, 2004):

- Biographical characteristics of the partner comprised age, gender and education.
- The Caregiver Reaction Assessment (CRA-NL; Nijboer, Triemstra, Tempelaar, Sanderman, & van den Bos, 1999) explored the experience of caregiver burden. The CRA measures caregiver reactions to providing care to family members and can be used to explore care giving in a variety of chronic illnesses. It consists of 5 dimensions: impact on schedule, financial impact, lack of family support, health related problems and caregiver esteem. Twenty-four items across the five dimensions are scored on a 5-point scale.
- The Centre for Epidemiology Studies-Depression questionnaire (CES-D; Bouma, Ranchor, Sanderman, & van Sonderen, 1995) was used to evaluate symptoms of depression. This questionnaire consists of 20 questions which are scored on a 3-point scale (maximum score 60). The cut-off for depression is 16.
- The Coping Skills in Stressful Situations Scale (CISS Dutch version; de Ridder & van Heck, 2004) explored coping style. The CISS consists of 3 coping scales: task-oriented, emotion-oriented and avoidance-oriented coping with 16 items in each scale. For each question, a 5-point scale is used for responses, providing a score range from 16-80 per subscale. Task-oriented coping describes activities directed towards problem-solving,

changing the situation or cognitively restructuring a problem and is considered an active coping style. Emotion-oriented coping describes emotional reactions in stressful situations, which aim to reduce stress and may or may not be successful, for example getting angry or reproaching oneself. Avoidance-oriented coping describes activities that aim to avoid a stressful situation, such as seeking company or seeking distraction.

Assessments of the person with aphasia:

- Biographical characteristics of the PWA comprised age, gender and education;
- Time post-onset;
- Rankin score for ADL functioning (Wilson, Hareendran, Hendry et al., 2005). The Rankin uses a 6-point scale, in which 0 denotes no symptoms and 5 denotes severe disability.
- Linguistic functions:
 - Boston Naming Test (BNT, Heesbeen & van Loon, 2001);
 - Token Test (AAT version, Graetz, de Bleser, & Willmes, 1981);
 - Semantic Association Test visual and verbal (SAT, Visch-Brink, Stronks, & Denes, 2005);
 - Spontaneous speech rating (Aphasia Severity rating Score, ASRS, Goodglass, Kaplan, & Barresi, 2001). This is a 6-point rating scale where 0 reflects no usable speech or auditory comprehension and 5 reflects a minimal discernible speech handicap.

Cognitive functions:

The emphasis in cognitive functioning is on executive function assessments, because of their effect on daily activities (Keil & Kaszniak, 2002) and the described relationship with conversation skill (Beckley et al., 2013)

- Wechsler Adult Intelligence Scales-Matrix reasoning (WAIS-IV-NL, Wechsler, 2012);

- Corsi Blocks (Kessels, van Zandvoort, Postma, Kapelle, & de Haan, 2000) a pointing span task for the assessment of working memory;
- Trail Making Test A & B (TMT-A, TMT-B, Reitan & Wolfson, 1995) to explore code switching and attention skills;
- Five Point Test (Goebel, Fuscher, Ferstl, & Mehdorn, 2009) to examine problem solving and cognitive flexibility.

Communicative skills:

- Amsterdam-Nijmegen Everyday Language Test (ANELT, Blomert, Koster & Kean, 1995), a measure of verbal communicative ability;
- Scenario Test (van der Meulen, van Gelder-Houthuizen, Wiegers, Wielaert, & van de Sandt-Koenderman, 2009), a measure of multimodal communicative ability.

Intervention

Prior to the training the SLT analysed videos dyads made themselves of conversation occurring in everyday situations in their home environment. In the first training session the analysis was discussed with the dyad using video feedback and goals for partner training were formulated. The SLT selected relevant handouts from the PACT package and provided partner training through video feedback, discussion, written exercises and home assignments, following the experiential learning steps (Kolb, 1984) incorporated in PACT. After the training the dyad made another set of videos, followed by a last session in which PACT was evaluated with the partner.

Conversation change judgment

An exploratory measure was set up to address whether changes in conversation behaviour of 34 dyads pre- and post-treatment could be captured in a quantifiable measure. From each

dyad 2 conversation samples of 3 minutes each were taken from the pre-PACT conversation videos and 2 samples from the post-PACT videos. Samples were selected according to a predetermined hierarchy to support ecological validity (Beeke et al., 2015) and to avoid selection of favourable samples. According to this hierarchy minute 5-8 (3 minutes long) was selected from the first and third recording of both the pre-PACT and the post-PACT videos. When only two recordings were available those were used. When a recording was less than 8 minutes, the last 3 minutes were used. When the recording was less than 3 minutes the following recording was used. During selection it was checked if dyads were both present and not disturbed by phone calls, visitors or engaged in other activities (for example recording improvements in walking ability of the PWA). The two samples from the pre-PACT videos and the two samples from the post-PACT videos were paired randomly in either pre-post-training or post-pre-training order per dyad, totalling 68 pairs of samples. Two independent judges, blinded to timing of the videos, rated the paired samples which were also presented in random order, using the format: “Is sample 2 worse or same or better than sample 1?”, thus generating 68 judgements per judge. The rating was based on conversation analytic criteria as used in PACT, such as turn taking patterns by the dyad, dealing with problems and repair, overall balance in the conversation and emotions shown during the conversation. Judge 1 had 30 years’ experience of aphasia treatment and some previous knowledge about PACT. Judge 2 had 6 years’ experience of aphasia treatment and no previous knowledge of PACT. Both judges received four hours training in which the rating was explained and practised. Discrepancies were discussed to reach consensus.

Partner experience

To gain a quantifiable and robust judgment of partner experience with PACT the Intrinsic Motivation Inventory (IMI, Deci et al., 1994) was used. Various affective experiences

accompany self-determined behaviour, such as a feeling of interest or enjoyment with a training exercise, perceived competence of a training task and the usefulness of the training. The IMI is made up of 7 subscales which can be modified to fit the goals of the study at hand (Deci et al., 1994). For this study four subscales were selected; a) “Enjoy” is the central subscale for intrinsic motivation and consists of 5 questions; b) the “Useful” subscale relates to the idea that activities that are experienced as useful become internalized and consists of 8 questions, c) the “Competence” subscale is a positive indicator of intrinsic motivation and consists of 8 questions and d) the “Effort” subscale denotes the effort participants put into the training, also signalling the importance of an activity and consists of 5 questions. Each question is rated on a 7-point Likert scale and the mean of those scores make up the score on that factor. The higher the score, the more this factor is represented. This IMI version was not validated prior to the study. The full text of the IMI version used in this study can be found in Appendix 1.

Partner satisfaction

To explore the benefit of PACT in terms of satisfaction with the training by partners, a brief questionnaire was used. Satisfaction with the training by partners was measured using a generic scale from 1-10, where 1 indicates the least satisfied and 10 the most satisfied. This is a familiar scale for participants as it is the common grading system in Dutch education. Additionally, open format questions within the questionnaire explored specific elements of PACT; they concerned pleasant and unpleasant components of the training, duration of the training, planning of the training and suggestions for improvement. Written responses to these questions were assembled and counted.

Data analysis

Descriptive statistics were used to analyse biographical data, the conversation judgments, the Likert-scale responses of the IMI questionnaire and the satisfaction rating scale. Cohen's Kappa was calculated for inter-rater agreement in the conversation judgments.

Change in pre- and post-measures were calculated using paired T-tests for partner data and Wilcoxon Signed Ranks Test for PWA data (according to normality of distribution).

To examine the relationship between partner and PWA characteristics and partner experience (IMI scales) Pearson r correlations were calculated.

Partner variables and PWA variables which correlated significantly in bivariate correlations with the different IMI scales were selected for multiple linear regression in order to establish their predictive value. All analyses were carried out using IBM Statistical Package for Social Sciences 17.0. Responses to the open questions were described.

Ethical approval

This study was performed in accordance with the Helsinki declaration and was approved by the Medical Ethics committee of Erasmus University Medical Centre, Rotterdam. All dyads gave written consent prior to data collection. Participation in the study was voluntary and participants were able to withdraw at any time, without having to provide an explanation.

Results

Participants

Forty one dyads were recruited from the regular caseload of speech and language departments at nine participating centres. Thirty-four dyads completed the training and the assessments.

The biographical data of the 34 participating dyads are set out in Table 1.

(Table 1 about here)

It is worth pointing out that the overall disability in the PWA was slight to moderate (Rankin median 3). The Rankin score focuses on motor limitations and 24 (71%) PWA were independent and able to look after themselves (Rankin < 3). However, an important measure of severity for PWA is the Aphasia Severity Rating Scale (ASRS) on which 31 (91%) of our participants scored 3 or below (median 1.5). This measure reflects their dependence upon their conversation partner in daily communication and provides support that these partners were appropriate candidates for the intervention in terms of the probability of experiencing difficulties in communicating with their aphasic partner. Five PWA were in residential care, two of whom went home for weekends. All other PWA lived at home and attended outpatient rehabilitation or day care facilities. All PWA were involved in regular SLT treatment of which no data were collected. Partners were not involved in treatment or training sessions offered through the participating centres, other than assistance with practical issues from social work or occupational therapy. Some partners attended a partner course, in which they received general information about stroke and its sequelae. Data on partner course attendance and partner interventions outside of the participating centres were not collected.

Seven dyads dropped out of the study. One person with aphasia died unexpectedly after the initial assessment. Three PWA were excluded because, on assessment, it was clear they did not meet the inclusion criteria, two showed multi infarct symptoms and one PWA appeared not to cooperate in the videos. Three women partners withdrew, two during the first assessment and one during the training. Comparison of the available data from these seven PWA and their partners with the group of participants shows that these PWA were older (Mean 67, SD 10.5) and longer post onset (Mean 39.4, SD 56.5). They also presented with lower ADL scores (Rankin median 3.5, range 2-4) and more severe aphasia according to the ASRS (Median 1, range 0-1). The available data of four partners suggest that they had more symptoms of depression (mean 25.3, SD 15.3, range 8-40) than the participant group.

Partner characteristics: pre-post results

Table 2 provides the partner scores on the three questionnaires for both pre and post PACT assessment. Within the caregiver reaction scale (CRA) the dimension of caregiver esteem was high, that is; this partner group evaluated the caregiver experience as more positive than negative. The CRA profile did not change after PACT. The group mean for depression symptoms (CES-D) before treatment was below the cut-off of 16, suggesting these partners were not depressed. The depression score decreased significantly ($p = .028$) over training time.

Inspection of the coping style profile (CISS) pre-PACT showed a higher frequency of task-oriented coping strategies in this partner group than the other two coping strategies. Over the training time task-oriented coping ($p = .003$) and avoidance-oriented coping ($p = .006$) both changed significantly, whereas emotion-oriented coping remained stable.

(Table 2 about here)

Characteristics of the persons with aphasia: pre-post results

The scores of the pre-PACT assessments show the severity of aphasia in our PWA group (Table 3). Although clinically the PWA group presented with aphasia as their predominant problem, they also had low cognition scores. Verbal communicative ability (ANELT) was particularly affected, whereas the Scenario test median score showed moderate multi-modal communicative abilities.

No significant changes were found in the pre- and post-language and communication assessments of the PWA. A trend towards improvement was observed in the Boston Naming Test ($p = .064$) and the ANELT ($p = .091$). The only significant improvement made in the

PWA was on the Trail Making Test (TMT). Only 16 out of 30 PWA were able to complete the TMT-B at pre- and post-assessments. This part of the test uses letters as well as numbers, making it a difficult task for PWA.

(Table 3 about here)

Conversation change

Table 4 shows the scores from judge 1 set out against the score of judge 2 for the 68 paired video conversation samples. Judge 1 rated more samples as ‘better’ (32 ratings) than Judge 2 did (19 ratings). The scores by judge 2 were more evenly distributed across the three categories of worse-same-better and judge 2 rated 25 pairs as ‘the same’, whereas judge 1 rated 15 pairs as ‘the same’. Inter-rater agreement between the two judges was very low ($\kappa = .24$), making it impossible to draw further conclusions regarding conversation change using this experimental measure.

(Table 4 about here)

Partner experience

The IMI (Table 5) shows high mean scores on all domains, reflecting an overall positive experience with the training. Partners were highly motivated and enjoyed the training, which provided a feeling of competence and usefulness. Partners also put their effort into the training. The number of training sessions was mutually agreed upon between the SLT and the partner, depending on the goals for the training. Across the group the number of sessions ranged from 1-11 (Mean 5.6, *SD* 1.95). Only one partner, who was the brother of a PWA with moderate-mild aphasia, engaged in one session.

(table 5 about here)

Partner satisfaction

Thirty three of the 34 questionnaires were returned. Partners showed great satisfaction with the training on the rating scale (mean 7.7, *SD* 0.9, range 6-10). Thirty partners reported the sessions with the SLT as very pleasant, enabling them to discuss the consequences of aphasia and in which conversation strategies were discussed and trained. Nine partners reported the role plays as pleasant, because they provided practical training opportunities and reflection on their behaviour with a professional they trusted, but four partners reported role plays as unpleasant without making any further comments. Six partners reported making the videos as pleasant and fifteen partners reported making the videos as unpleasant but useful, both groups agreeing on the value of the videos for improving awareness and making the sessions tailored to their own needs. Home assignments were reported as pleasant by four partners and unpleasant by five, without providing further reasons. Overall the partners stated their satisfaction with the timing of PACT and the time they had invested in it. Suggestions for improvement were provided by 13 partners and varied widely, ranging from a comment on the tripod for the camera to providing this training earlier in the rehabilitation trajectory, which was mentioned by three partners.

Predicting benefit of PACT

As our initial idea of predicting benefit, in terms of changed conversation behaviour, failed, we used the partner experience scores as dependent variables in the multiple regression analyses. Four of the partner characteristics (task-oriented and emotion-oriented coping, caregiver esteem and partner age) correlated significantly ($p < .05$) with the IMI sub-scales

“IMI-Enjoy”, “IMI-Competence” and “IMI-Useful”. These variables were selected for the multiple regression analyses with the IMI sub-scales as dependent variables. Three PWA characteristics, Token Test, ASRS and ANELT correlated with “IMI-effort”. These were all indicators of aphasia severity showing high co-linearity. The ANELT ($r = -.368, p = .03$) was chosen to include in the regression models; it provides a reliable measure of verbal communicative ability which links with conversation skills. In Table 6 the results of the regression analyses are presented.

(Table 6 about here)

In the models for “IMI-Enjoy” and “IMI-Competence”, caregiver esteem was an important predictor. Partner age also had a role, in negatively predicting “IMI-Enjoy”, suggesting that older partners enjoyed the training less. For “IMI-Useful” the model yielded no significant predictors, whereas the model for “IMI-Effort” showed the ANELT score as a negative predictor suggesting that partners of people with more restricted verbal abilities put more effort in the training or perceived the training as more important.

Although we also found high positive correlations between the number of sessions with all the IMI subscales, we did not include this variable in the regression models. The number of sessions was a collaborative decision between the SLT and the partner, based on partner needs and goals for training, and initially also subject to local planning procedures, as part of the implementation aims. As such the number of sessions was a post intervention and implementation finding and cannot be tested for its predictive value.

Discussion

With the introduction of PACT into clinical practice, it was partners of people with predominantly severe aphasia who were, on average, 11.5 months post onset, who engaged in the training. Most of the PWA lived at home and dyads were once more having more conversations in a natural setting, instead of interactions limited to visiting hours during their stays in the rehabilitation facilities. The partners presented with high caregiver esteem scores at onset of the training, suggesting a commitment to looking after their spouse with aphasia. A task-oriented coping style predominated in this group, suggesting an inclination to problem solve and actively engage with problems they faced. Partners were satisfied with PACT. They enjoyed the training which gave them a feeling of competence and usefulness, despite the effort they also put into it. Partner scores for task-oriented and avoidance-oriented coping increased significantly and their symptoms of depression decreased significantly. According to Lazarus and Folkman (1984), coping strategies vary with different stressful situations and success of a strategy will depend on the problem. As such, at certain times an avoidance strategy, such as seeking the company of others, may be more helpful than actively trying to solve a persistent problem. Although a generic coping questionnaire may not pick up specific coping strategies used by those who are facing communication problems (McGurk et al., 2011), this study was able to assess a dominant coping style present at a specific time point and the findings here corroborate findings where coping skills of partners have been shown to be crucial in dealing with a life changing event such as stroke (McGurk et al., 2011; Quinn et al., 2014; Visser-Meily et al., 2009).

The caregiver experience has been mostly described in negative terms, but a more complex picture emerges from qualitative research, where the positive experience from providing care is also described (McPherson, Wilson, Chyurlia, & Leclerc, 2011). The high scores for

caregiver esteem in this partner group tied in with their positive training experience and may have made them ideal candidates for conversation partner training.

A negative prediction was found for partner age and their enjoyment of the training, indicating that the elder participants enjoyed the training less, although no negative predictions were found for the other aspects of their experience with the training. A qualitative description may provide more detailed information of the partners' experience with PACT.

Within this implementation study, partners of people with severe aphasia were the first to engage with the new intervention, possibly experiencing greater need for help than partners of people with milder aphasia. Severity of impairment is an important predictor of partner distress in the longer term (Bakas et al., 2006; Lutz & Young, 2010). Severity of communicative disability was the only PWA characteristic predicting partner outcome in terms of effort they put into the training. The effort subscale also denoted the perceived importance of an activity; supporting the idea that partners of people with more severe communicative disability felt a greater need for help and put more effort into the training. The data available on the dyads who dropped out of the study, suggested that contra-indications for PACT might be when the aphasia was even more severe and had existed for a longer time. Many studies on CPT include (predominantly) PWA with less severe aphasias (Saldert et al., 2013; Simmons-Mackie et al., 2010; Wilkinson et al., 2010). The speech and language therapists involved in the implementation of PACT confirmed a changed perspective on communication by themselves, paying more attention to the two-way process of a conversation where there needs to be equal responsibility from both conversation partners in the interaction, despite the presence of aphasia (Wielert et al., submitted). SLTs may have had more problems in relating this concept to partners of people with moderate or mild aphasia, especially during the sub-acute stage of stroke rehabilitation, where partners and

PWA were concentrating on recovery. Also partners who seemed to be coping fine, though in reality were ‘suffering in silence’ (Quinn et al., 2014, p.189), may have been overlooked by SLTs.

There was some improvement in naming and verbal communicative ability across the group. Although improved communicative abilities in PWA after the partner or dyad engaged in conversation training has been shown (Simmons-Mackie et al., 2010), the improvement here was likely to have resulted from the language treatment that most of the PWA were still receiving.

Lutz and Young (2010) proposed a family-centered approach, in which individual needs and preferences were assessed. This would be in contrast to a systems approach, where help for families was in danger of getting lost during transitions from one care provider to the next. Although partner needs have been particularly associated with the characteristics of partners themselves (McGurk et al., 2011; Visser-Meily et al., 2009), the relationship with severity of the PWA and the timing of the training needs further exploring.

The goal of CPT has always been to improve conversations in natural settings and this has provided a challenge for objective measurement (Beeke et al., 2011), which lends itself for quantification and can be used in group studies, when qualitative investigation of the data is not feasible. The “Measure of skill in Supported Conversation” (MSC) and “Measure of Participation in Conversation” (MPC) (Kagan, Winckel, Black et al., 2004) showed reliability in a stroke population with volunteer conversation partners and in a TBI population with different conversation partners (Togher, Power, Tate, McDonald, & Rietdijk, 2010). A Swedish adaptation of the MSC/MPC scales, The Measure of Interaction in Communication (MIC, Saldert et al., 2013) was developed to deal with inter-rater reliability problems. Also in the Dutch adaptation of these scales (Okx, 2014) we established low inter-rater reliability.

Therefore an experimental measure was used here in which two blinded, independent judges rated pre- and post-conversation samples with a global rating of worse-same-better, which was assumed to support inter-rater reliability. This measure also lend itself for quantification, which would be useful for group studies. Again no inter-rater reliability was achieved and it was not possible to observe change in conversation in this way. Objective proof of conversation change at group level has been difficult to establish, given the number of confounding factors at this level of behaviour. These factors are within three domains: the judges, the dyads and the samples. Our two judges differed in terms of experience in treating aphasia and in previous knowledge of working with PACT. As the implementation study showed that experience with PACT changed the perspective of SLTs on observing conversations (Wielaert et al., submitted), this may have caused a difference in the judges too. Within the dyads, the severity of the aphasia may have clouded over any subtle changes that may have occurred in their conversations, causing the least experienced judge to rate many of the samples as the same. And, last but not least, the type of conversation data and the length of the samples may have negatively influenced our results. Three minute samples were chosen because both samples needed to be viewed before rating. We expected that longer samples would incur problems remembering each. As the samples were selected according to a predetermined hierarchy, it is likely that there were large differences in the types of interactions occurring in the samples which made them hard to compare. Some standardization in the interaction occurring in the video samples may be needed, although this may be at the cost of ecological validity. Togher et al. (2010) chose a descriptive task for part of their video and in Kagan et al., (2004), the conversation partners (volunteers) and the setting (aphasia centre) may have provided some standardisation in the interaction. Blom-Johansson et al. (2013)'s video samples contained a conversation based on the instruction to

communicate about a current event, again providing some anchorage to the conversation partners as well as the judges.

The subjective evaluation of participants provided valuable information about the experience and satisfaction of participants. The version of the IMI that was used was not validated prior to this study and, as with any questionnaire, may have suffered bias from socially desired responses. Nonetheless, the findings accord with other findings in the literature.

Partners were satisfied with the duration of the training, averaging on 5.6 sessions of 1 hour. They particularly appreciated the sessions with the SLT and the role plays, both reflecting an appreciation of the individualized and practical nature of PACT. This finding is in support of the general idea that information provision in stroke requires active involvement (Smith, Forster, & Young, 2009).

Conclusions

This study found partners willing to engage in CPT once the PWA returned home and the dyads were once more engaging in conversations in everyday situations in their home environment. Especially partners of people with severe aphasia engaged with the training. Partners who presented with high caregiver esteem and a relatively high task-oriented coping style made good candidates for conversation partner training which they enjoyed and with which they were satisfied. The method of experiential learning used in PACT fed into the needs of competency and autonomy, judged to be important in order to remain intrinsically motivated for a training task (Deci et al., 1984). Intrinsic motivation and the awareness of the learning style of candidates (Sorin-Peters & Patterson, 2014) may well be the working mechanisms of successful education programmes that require active engagement (Smith et al., 2009) and that are tailored to fit individual needs (Blom-Johansson et al., 2013; Hafsteinsdottir et al., 2011; Hilton et al., 2014).

The study underlined the importance of partner characteristics such as motivation, coping style and a positive outlook on caregiving as possible selection criteria for CPT. A partner assessment that considers these attributes (Young, Lutz, Creasy, Cox, & Martz, 2014) may assist in this clinical decision making process.

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Appendix 1 Intrinsic Motivation Inventory-version for PACT

1. I think I was pretty good at this training. (competence)
2. I would be willing to do PACT again, because it has some value to me. (useful)
3. I am satisfied with my performance in PACT. (competence)
4. I didn't try very hard to do well in this training.(effort) *Reversed*
5. I believe PACT was of some value to me. (useful)
6. I found PACT to be very interesting. (enjoy)
7. This was a training I couldn't do very well. (competence) *Reversed*
8. I was pretty skilled at doing PACT exercises. (competence)
9. I thought PACT was boring (enjoy) *Reversed*
10. I think PACT is important to do because it can improve our communication. (useful)
11. After working with PACT for a while, I felt pretty competent. (competence)
12. I tried very hard on this training. (effort)
13. I put a lot of effort into this training. (effort)
14. I understand how PACT exercises are related to our communication problems.
(competence)
15. I believe doing PACT could be beneficial to me. (useful)
16. I enjoyed this training very much. (enjoy)
17. I did not put much energy in this training. (effort) *Reversed*
18. I think our communication changed after PACT. (useful)
19. I think I understand the consequences of aphasia better now. (competence)
20. I think doing PACT was useful for our communication. (useful)
21. I think training with the SLT was quite enjoyable. (enjoy)
22. I think doing PACT could help me to improve our communication. (useful)

23. I gained more insight in our communication because of PACT. (competence)

24. Our communication did not change after this training. (useful) *Reversed*

25. It was important to me to do well on this training. (effort)

26. PACT was fun to do. (enjoy)

Scoring is on 7-point Likert scale;

1 = not at all true

4 = somewhat true

7 = very true

Table 1 Characteristics of participants ($N=34$)

ASRS = Aphasia Severity Rating Scale (Goodglass et al., 2001).

M = Mean, S = Standard Deviation, R = Range, MPO = Months Post Onset

	Participating dyads	Persons with aphasia	Partners
Gender	male	16	17
	female	18	17
Age, M (SD) R		61.7 (12) 38-83	60.5 (10.6) 39-82
Education	≤ 12 years	25	24
	> 12 years	9	10
Relationship	spouse	31	31
	father / son	1	1
	daughter / mother	1	1
	sister / brother	1	1
MPO, M (SD) R		11.5 (16.3) 3.3-97.2	
Rankin score (0-5) median / range		3 / 0-4	-
ASRS (0-5) median / range		1.5 / 0-5	-

Table 2 Partner scores pre and post PACT

Paired T-test, * $p < .05$

CRA-NL = Caregiver Reaction Assessment (Nijboer et al., 1999), CES-D = Centre for Epidemiology-depression (Bouma et al., 1995), CISS = Coping Inventory for Stressful Situations (de Ridder & van Heck, 2004), M = Mean, SD = Standard deviation

Test	Questionnaire	Max score	Pre-PACT $M (SD)$	Post-PACT $M (SD)$	p
CRA ($N=32$)	Impact on schedule	5	3.4 (0.7)	3.2 (0.8)	.094
	Financial impact	5	2.7 (0.9)	2.6 (0.8)	.396
	Lack of family support	5	2.5 (0.5)	2.4 (0.6)	.296
	Health related problems	5	2.5 (0.8)	2.4 (0.7)	.327
	Caregiver esteem	5	4.0 (0.4)	4.0 (0.5)	.509
CES-D ($N=34$)		60	13.6 (8.5)	11.2 (7.3)	.028*
CISS ($N=34$)	Task oriented coping	80	51.9 (9.4)	56.9 (7.5)	.003*
	Emotion oriented coping	80	36.4 (11.1)	35.3 (8.8)	.477
	Avoidance oriented coping	80	36.9 (12.2)	41.4 (8.9)	.006*

Table 3 PWA scores pre and post PACT

Wilcoxon signed ranks test, paired, two-tailed, * $p < .05$

SAT = Semantic Association Test (Visch-Brink et al., 2005); WAIS = Wechsler Adult

Intelligence Scale III (Wechsler, 2012); TMT = Trail Making Test (Reitan & Wolfson, 1995);

ANELT = Amsterdam-Nijmegen Everyday Language Test (Blomert et al., 1995).

Domain	Test	Max score	Pre PACT Median	post PACT Median	<i>p</i>
Language	Token Test (<i>N</i> =31)	50	36.0	37.0	.654
	Boston Naming Test (<i>N</i> =34)	60	9.5	10.5	.064
	SAT verbal (<i>N</i> =32)	30	23.0	22.0	.711
	SAT visual (<i>N</i> =33)	30	25.5	25.0	.924
Cognition	WAIS matrix (<i>N</i> =34)	24	8.0	9.5	.119
	Corsi blocks, total span (<i>N</i> =34)		30.0	35.0	.135
	Five Point Test - Production (<i>n</i> =31)		15.0	17.0	.212
	TMT (in seconds) - TMT-A (<i>N</i> =30)		92.0	69.0	.017*
	- TMT-B (<i>N</i> =16)		183.0	140.0	.002*
Communication	ANELT Understandability (<i>N</i> =34)	50	19.5	25.5	.091
	Scenario Test (<i>N</i> =34)	54	43.0	47.0	.329

Table 4 Conversation change judgments by two independent judges

		Judge 2			
		Worse	Same	Better	Total
Judge 1	Worse	13	7	1	21
	Same	3	7	5	15
	Better	8	11	13	32
	Total	24	25	19	68

Table 5 Post PACT partner perceptions in 4 IMI domains (Deci et al., 1994)

M=Mean, *SD*=Standard deviation, *R*= range

IMI	Max score	<i>M</i> (<i>SD</i>)	<i>R</i>
Enjoy	7	6.2 (1)	2.2 - 7
Useful	7	5.8 (1)	2.5 - 7
Competence	7	5.4 (1)	1.8 - 6.8
Effort	7	5.0 (1)	3 - 7

Table 6 Predictors for partner experience on four IMI domains (Deci et al., 1994)

Multiple linear regression, * $p \leq .05$

	IMI enjoy <i>B (CI 95%)</i>	IMI competence <i>B (CI 95%)</i>	IMI Useful <i>B (CI 95%)</i>	IMI effort <i>B (CI 95%)</i>
Task-oriented coping Pre PACT	.03 (-.005, .061)	.03 (-.005, .060)	.03 (-.003, .071)	-
Emotion-oriented coping Pre PACT	.03 (-.002, .054)	.02 (-.006, .049)	.02 (-.011, .051)	-
Caregiver esteem Pre PACT	.69 (-.001, 1.380)*	.74 (.059, 1.42)*	-	-
Partner age	-.03 (-.055, .000)*	-.03 (-.053, .002)	-	-
ANELT Pre PACT	-	-	-	-.03 (-.052, -.002)*
Variance explained	49%	47%	21%	14%