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Abstract

Check In Check Out (CICO) is a support programme for students with externalising problem behaviours. This study implemented in Finland is one of the first reports on the application of CICO in the European context. An experimental, multiple-baseline, single-case design is used to examine the effects of the CICO intervention on the problem behaviour and appropriate behaviour of three general-education primary-school pupils. The similarity of the observation data and the information provided in daily report card (DRC) are investigated to gauge the validity of the DRC assessments. The fidelity and social validity of the intervention are also analysed. CICO reduced problem behaviour in all pupils. The results suggest that DRCs are valid tools for estimating behaviour in applied settings. CICO was implemented with high fidelity, and it had excellent acceptability among school personnel. This study adds to the existing literature by implying that effective behaviour support for pupils with disruptive behaviours can be applied easily in general education settings and in diverse international contexts.

Keywords: behavioural difficulties, intervention, single-case experimental design, ADHD

Check In Check Out Intervention for Supporting Pupils' Behaviour: Effectiveness and Feasibility
in Finnish Schools

Behavioural problems and classroom disruptions not only complicate learning for pupils with problem behaviour but also make learning more difficult for others. Pupils demonstrating serious or persistent problem behaviour are at higher risk of academic failure and poor social outcomes, which are both detrimental to development later in life (Wagner et al. 2005). These disruptions are also a major source of stress for teachers (Klassen and Chiu 2010). Discipline concerns are evident in Finnish schools (OECD 2013), yet the evidence-based behaviour-management intervention programmes are not systematically used. The effectiveness of the Check In Check Out (CICO) intervention at reducing problem behaviour has been evaluated in North American schools (Hawken et al. 2014; Wolfe et al. 2016) but has not been studied in other contexts. The purpose of this study was to apply CICO and evaluate its effectiveness in the Finnish educational system.

The provision of special education services varies from one country to another. In Finland, pupils are entitled to receive special education support alongside other teaching from special education teachers who are not assigned to teaching classes (the part-time special education system). Schools' multi-professional pedagogical teams determine the support pupils need in reviews, without the requirement for psychological evaluations or medical diagnosis, although these are still often used (Björn et al. 2016). The use of behavioural expertise when planning preventive support for pupils with severe behavioural problems is rare in mainstream schools, as psychological assessment is seen as the major task of school psychologists (Ahtola and Niemi 2014). Behaviour management also receives very little attention in teacher education (see Honkasilta et al. 2014), and this is reflected in schools' lack of experience in using evidence-based interventions for behavioural problems.

School-Wide Positive Behaviour Interventions and Support (SWPBIS) has been introduced as a general framework offering an alternative form of support to traditional exclusionary and punitive school-discipline policies (Sugai and Horner 2002). SWPBIS is organised around multiple tiers of support in schools. Universal-level (Tier 1) support focuses on preventing problem behaviours and promoting positive behaviour among all pupils. When minor problem behaviours are prevented, the identification of pupils in need of additional support is more efficient (Mitchell, Stormont, and Gage 2011). Secondary prevention (Tier 2) services include identification of at-risk pupils before patterns of chronic problem behaviours develop, and practices are matched to pupils' individual needs (Lewis et al. 2010). Efficient secondary prevent support requires careful monitoring to determine its effectiveness (Lewis et al. 2010). Intensive (Tier 3) prevention usually includes a functional behaviour assessment on which individual support plans are based (Horner, Sugai, and Anderson 2010).

Problem behaviour in the classroom is often associated with hyperactivity, impulsivity and attention problems, which are the core symptoms of attention deficit hyperactivity disorder (ADHD). The worldwide prevalence of ADHD is 7% (Thomas et al. 2015), and many behavioural school-based interventions have been developed to produce meaningful gains with these pupils (e.g. DuPaul, Eckert, and Vilaro 2012). The behavioural difficulties of pupils with ADHD symptoms can be successfully addressed with preventive and proactive approaches in general education if teachers are supported in using effective behaviour-management and instructional strategies (DuPaul, Eckert, and Vilaro 2012). One widely studied support is the Daily Report Card (DRC), which has been found to be effective at increasing appropriate behaviour and academic productivity in pupils' everyday situations (Fabiano et al. 2010). DRCs include an operationalised list of pupils' target behaviours and the criteria for meeting these goals. Teachers track pupils' progress on the DRCs, which are sent home with pupil every day.

The CICO intervention (Crone, Hawken, and Horner 2010) centres on the use of DRCs to increase the structure and frequency of immediate positive feedback. CICO is based on behavioural psychology (Kazdin 2013) and on the premise that behaviours are influenced by contextual factors, antecedents and consequences. The visual reminders of the behavioural goals in the DRC and the daily communication between adults at school and home can be construed as the antecedents of the appropriate behaviour. The consequence of appropriate behaviours is positive attention throughout the school day in the form of verbal and written feedback and, at the end of the day, tangible rewards.

There are several studies on the efficacy and feasibility of CICO interventions in North America, but there is dearth of studies on its use in other education systems. Hawken et al. (2014) reported that the CICO intervention changed behaviour in half of the cases (49%) of single-subject studies and 75% of group studies. Also, the fidelity rates of the core components and the social validity have consistently been high level (Hawken et al. 2014; Wolfe et al. 2016). The effectiveness of CICO needs to be monitored. The gold standard in monitoring is independent observations, but these are labour intensive and difficult to apply in schools. In CICO, pupils are constantly monitored through DRCs, which provide easily collectable information for decision making. Some evidence supports that DRCs are an acceptable, viable source of information (Chafouleas et al. 2005), but their reliability as a measure of behaviour change has yet to be confirmed.

To fill these research gaps, the following questions were set:

1. Is there a functional relationship between CICO and decreases in pupils' problem behaviour, as measured by direct observations and teacher ratings?

2. Are DRCs a valid tool to measure problem behaviour? In other words, what is the relationship between DRCs rated by teachers and direct observation data obtained by external observers?
3. Can CICO be implemented with high fidelity?
4. Is the CICO intervention acceptable for teachers, parents and pupils?

Method

Participants and Setting

The teachers were instructed to nominate pupils whose behavioural problems were persistent and appeared in many situations. School behaviour-support team members interviewed the teachers and then obtained consent to the participation in the research from the pupils' legal guardian. All participants were Finnish males and average learners in most school subjects. John was on the second-grade, and had been diagnosed with attention deficit hyperactivity disorder combined type (ADHD-C) in a university hospital clinic. He was taking methylphenidate at a constant level throughout the study. His parents were separated, and he spent alternating weeks with each parent. David was on the third-grade, and he lived with his mother. Andrew was on the sixth-grade, he had been diagnosed with ADHD-C in a university hospital clinic and was taking methylphenidate and risperidone at constant levels throughout the study. Andrew lived in a two-parent family.

The study was conducted in two primary schools with slightly more than 300 pupils each during the autumn term of 2014. School A was a typical Finnish primary school, serving pupils from preschool through sixth grade, and was in the first year of implementing the CICO intervention. School B had pupils from preschool through sixth grade and some special education classes (20.4% of the pupils were identified as having special educational needs) through ninth grade. School B was in the second year of implementing the CICO intervention.

Both schools had implemented the SWPBIS (in Finland 'ProSchool') for approximately three years. During that time, 3 – 5 explicit, simple and consistent core behavioural expectations were defined. The teachers and staff were also trained to provide positive feedback on appropriate behaviour. Before the intervention was implemented, the schools had one day (six hours) of CICO training.

Procedure

The interview for pupil identification was modified from the Functional Assessment Checklist for Teachers and Staff (March and Horner 2002). The interviews identified the pupils' strengths and problem behaviours, determined when and where problem behaviours occurred, and prioritised problem behaviours. Following the interviews, one to three positively framed individual goals, like "I will do my task" or "I will speak proper language" were set for the pupils' behaviour. CICO usually involves the same expectations for each pupil (Hawken et al. 2014; Wolfe et al. 2016), but in this study individual expectations were used so that the use of CICO corresponded to the Finnish regulations for organising Tier 2 support (National Board of Education 2011). The behaviour-support team determined the daily individual goals (set at 70% success for all participants) for which the pupils could earn rewards.

In the CICO intervention, the pupils checked in to receive their DRCs for that day with the same paraprofessional CICO assistant throughout the intervention, so a safe, trustful adult relationship was established. During the day, the teachers evaluated the pupils' behaviour in relation to their behavioural goals at the end of every lesson (0 = expectations not met, 1 = expectations met partly, 2 = expectations met) and also gave positive verbal feedback. In the afternoon check-out meeting the pupils reviewed their DRCs with the CICO assistant and, if they met the predetermined goals, received tokens. By collecting them, the pupils could receive

rewards at the end of the week or when earning an agreed-upon number of tokens. Finally, the pupils took the DRCs home to their parents, and then returned signed DRCs to school next day.

A multiple-baseline design with three subjects was conducted over 12 weeks. The data analysis included visual analysis of performance level, trends, and variability in each phase (i.e. baseline and intervention) (Horner et al. 2005). To further evaluate the efficacy of the intervention, the percentage of data points exceeding the median (PEM) of baseline phase was used. PEM makes it possible to compute meaningful scores even with the presence of outlier points during the baseline phase and has reasonable agreement with visual analysis (Ma 2006; Wolery et al. 2010). PEM is argued to correspond well with the Scruggs and Mastropieri (1998) criteria (very effective: > 90%; effective: 70%–89%, questionably effective: 69%–50%) (Ma 2006).

Measures

Problem behaviour. The primary dependent variables were the percentage of intervals with problem behaviours and the daily percentage of points on the DRCs. The problem behaviours were a) disruption (e.g. making noises or talking out of turn), b) out of seat (or otherwise in wrong location), c) noncompliance (refusing to follow adult's instruction) and d) negative verbal or physical interaction (e.g. kicking, hitting, pinching or throwing objects at a person or making an offensive comment about or toward another individual) (Campbell and Anderson 2011). An interval was reported as a problem behaviour interval if one or more problem behaviours occurred during it.

Appropriate behaviour. The secondary dependent variable was the percentage of intervals with e) appropriate behaviour, which was coded if no problem behaviours occurred. Undisruptive off-task behaviours (e.g. staring out the window) were defined as appropriate unless the teacher directed the pupil to another behaviour (pupil had ten seconds to comply).

Observation data were collected with pen and paper during 15-minute observation sessions using a 10-second partial interval recording system. Observations were conducted at least three times per week during the academic activities identified as the most difficult. Five paraprofessionals and two teachers participated in two 5-hour training sessions to conduct the observations. After the training, the observers practiced in the classrooms until the interobserver agreement for all the observers met the 90% criteria.

Interobserver agreement. Interobserver agreement data were collected for 29.4% of the observation sessions (David 71.4% and 16.7%, John 37.0% and 20.0% and Andrew 45.0% and 27.3% during the baseline and intervention phases, respectively). Data were collected by two observers independently marking their observations in the same settings. Total agreement (TA) was calculated as $(\text{number of agreed intervals} / \text{all intervals}) * 100$. The mean TA was 86.4% (range: 80.0%–96.7%) for David, 95.3% (range: 84.4%–100%) for John and 88.5% (range: 83.3%–96.67%) for Andrew. The overall mean was 90.8%. Mean occurrence-only agreement for the study across all three participants was 83.7% (range: 81.3%–85.2%).

DRC ratings. In the baseline phase, the teachers scored the pupils' behaviour in their DRCs but did not provide any feedback to them. In the intervention phase, the DRCs were used to provide pupils with feedback on their behaviour after each lesson. To determine the similarity the Pearson product-moment correlation coefficient between the percentage of the appropriate behaviour intervals in observations and the DRC ratings of the same lessons was computed.

Fidelity. CICO assistants completed the summary sheets on the five core components of the intervention (Hawken and Horner 2003). The items were pupil (a) attending morning check-in, (b) afternoon check-out meeting and, (c) returning the signed DRC, (d) teacher completing the DRC evaluations and (e) assistant marking the percentage of DRC points earned.

Social validity. Teachers and parents used a modified version of the Behaviour Education Program Acceptability Questionnaire (Hawken and Horner 2003) to evaluate the extent to which they perceived the intervention to (a) reduce problem and (b) increase appropriate behaviour, (c) be easy to implement, (d) be worth the effort, and (e) be worth recommending to others. The scores were on a Likert scale ranging from 1 (totally disagree) to 6 (totally agree).

The pupils' perceptions of the CICO implementation were assessed using a 7-item (see Table 2) questionnaire with Likert-like scale ranging from 1 (totally disagree) to 4 (totally agree).

Results

Direct Observation and DRC Points

The results from the problem behaviour intervals across the phases are presented in Figure 1. David averaged 44.4% of intervals with problem behaviour during the baseline phase with high variability (range: 5.6%–81.1%). During the intervention phase, problem behaviours occurred in 19.5% of intervals with less variability (range: 0.0%–47.8%), marking a decrease of 24.8 percentage points from baseline. During CICO implementation, both the level and the variability of problem behaviour decreased. The PEM value was 89.3%.

John averaged 24.6% of intervals with problem behaviour during the baseline phase with high variability (range 0.0%–69.4%). During CICO implementation, he averaged 15.2% of intervals with problem behaviour, a decrease of 9.4 percentage points from baseline (range: 0.0%–32.2%). The CICO implementation produced positive trends and relatively stable behaviour. However, John's median PEM value was only 52.9%.

Andrew averaged 40.6% of intervals with problem behaviour during the baseline phase with high variability (range: 3.3%–100%). Problem behaviours decreased immediately after implementation of CICO as he averaged 19.5% of intervals with problem behaviours. With the exception of the fifth observation (100% of intervals with problem behaviour), variability was

moderate (range: 0.0%–30%), a decrease of 21.1 percentage points from baseline. Andrew's PEM value was 90.9%. Vertical analysis of the observations shows that, for all the three pupils, the intervention immediately had effects at the beginning of the intervention phase, indicating a functional relationship between the intervention and the outcome of problem behaviour.

Figure 1 here

David's DRC ratings of appropriate behaviour during the baseline averaged 66.7%, (range 41.7%–70.0%). The DRC rating in the CICO phase was 12.1 percentage points higher than in the baseline phase, with an average rating of 78.7% (range 52.8%–100%). The PEM value was 76.7%.

John averaged 74.3% (range: 30.0%–100%) intervals with appropriate behaviour during the baseline. Rating increased by 10.1 percentage points after CICO was implemented. The average DRC rating during the intervention phase was 84.4% (range 60.0%–100%). The PEM value was 89.3%.

Andrew averaged 61.9% (range: 21.4%–100%) of intervals with appropriate behaviour during the baseline. The DRC rating increased by 15.6 percentage points after CICO was implemented. The average DRC rating during the intervention phase was 77.5% (range: 59.1%–100%). The PEM value was 100%.

Similarity of Observations and DRC Ratings

The Pearson's correlations between the percentages of appropriate behaviour in the direct observations and the teacher evaluations in the DRCs of the same lessons were moderate to strong by their effect size and significant at $p < .001$ for all pupils Andrew: $r(38) = .64$; David: $r(33) = .70$; and John: $r(86) = .64$.

Fidelity

The intervention was implemented with high average fidelity (92%). The mean percentage was 99.3% (range: 96.4%–100%) for John, 90.9% (range: 72.7%–100%) for David, and 86.7 % (range: 72.2%–100%) for Andrew. The lowest score for all the participants was for returning the DRCs to school next morning with the parents' initials. The intervention was implemented with somewhat more fidelity in school B (in the second year of implementing CICO). The mean percentage for the five core components was 88.8% (range: 72.2%–100%) for school A and 99.3% (range: 96.4%–100%) for school B.

Social Validity

The parent and teacher evaluations (Table 1) indicated a high level of social validity, the overall mean being 4.6 for teachers and 4.9 for parents. The highest mean teacher ratings were for the items asking whether the intervention was easy to implement and whether it was worth recommending to others. The highest mean parent rating concerned whether the implementation was worth recommending to others.

Table 1 here

The pupils' perceptions of the support and encouragement they received during the CICO intervention are presented in Table 2. The mean ratings for the feeling of support during CICO were 3.4 for David, 3.1 for John and 3.4 for Andrew. The lowest pupils' ratings were for 'my teachers help me to improve my behaviour' and 'I have been told how to improve my behaviour', especially in John's evaluation. Parental involvement (Table 2) received excellent scores from all the pupils and their ratings on both the teacher and parent use of DRC were high.

Table 2 here

Discussion

A functional relationship between the CICO intervention and decreased problem behaviour was suggested by the vertical and visual analysis of the graphed observation data. The

pupils' average reduction in observed problem behaviour was 18.4% from the baseline to the intervention. The decreases in problem behaviour were similar to those observed in previous research (Campbell and Anderson 2011). The correspondence of the observations and the DRC ratings indicated that DRCs may be a reliable and viable source of information for schools' behaviour-support teams. A perfect correlation between the two measures could not be expected as the DRC ratings covered whole lessons, and the observations only parts of lessons.

The fidelity of the CICO implementation was high and indicated that the CICO intervention can be implemented by various school personnel (see Hawken and Horner 2003), in our case by paraprofessionals serving as CICO assistants. Further support for the feasibility of the CICO intervention came from the teachers' evaluations on the intervention's social validity, which were at the same high level as reported in the systematic review by Wolfe et al. (2016). In this study, the behavioural expectations were individualised for each participant. This adaptation lies between the standard approach, in which the behavioural expectations in DRCs are the same for all students (Campbell and Anderson 2011), and the highly-individualised approach, in which the behavioural expectations are based on individual functional assessments (e.g. Cheney et al. 2009). This modified CICO took more time due to the individualised planning, but the Finnish teachers still found it easy to use.

The observed problem-behaviour PEM values indicated that the intervention was clearly effective for two of the three pupils. The results for John were not as clear; the teacher assessments in the DRCs indicated effectiveness (PEM value: 89%), but the observation results supported only questionable effectiveness (PEM value: 52.9%). Several possible explanations can be suggested. According to John's teachers, he clearly reacted to the external person present in the classroom at the beginning of the baseline observation and improved his behaviour when the observers were present. This issue was solved by adding the frequency of the observations

(see Figure 1). The results for John might also be related to the reward timetable used in the study. John was diagnosed with ADHD, which is known to be related to difficulties functioning in situations involving delayed rewards (e.g. Sonuga-Barke et al. 2008). The use of more immediate reinforcements could have resulted in more positive effects and social validity evaluations.

Traditional responses to problem behaviours often emphasise pulling pupils with problematic behaviour out of the classroom, and too often, the major efforts to influence pupils' behaviour have relied on negative consequences and punishments after disruptive behaviour has occurred. Building trusting relationships with pupils, in contrast, is one of the most important aspects of effective behavioural support. In this study, pupils for whom the CICO intervention was clearly effective reported that they had had support from their teachers and parents. This is a notable result as previous research has shown that children with problem behaviour often have mainly negative relationships with adults (Hamre and Pianta 2001). Teachers and parents adopting a unified position and shared responsibility for giving positive feedback guides pupils to achieve their behavioural goals.

Limitations

The results of this study should be interpreted in the light of some limitations. The proportion of observations used to calculate the interobserver agreement for David during the intervention phase was slightly lower than the standard of 20% (Kratowill et al. 2013). However, the total proportion of two independent observations exceeded the standard, and interobserver agreement was consistently high. There are no validated guidelines for PEM interpretation, and the interpretation used in this study may, in some cases, identify interventions as effective when they are not (Wolery et al. 2010). However, the visual analysis and the PEM values correspond reasonably well, supporting confidence in the results.

A limitation of this study, and vast majority of similar previous studies, is, that there is to date very little research evidence on the maintenance of intervention effects (Mitchell, Stormont, and Gage 2011). Although some initial findings are promising, this is an area needing more attention of research in the future.

Conclusion

This study expands existing research on CICO on its efficacy and applicability in a European setting. Increased positive feedback and carefully set, realistic behavioural goals lay the groundwork for changes in behaviours and help educators ensure that pupils experience success. The CICO intervention offers a potentially efficient, well-structured alternative to address the behavioural needs of pupils who do not benefit from primary-level positive behaviour interventions.

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Figure 1. Percentage of 10-s intervals with problem behaviour

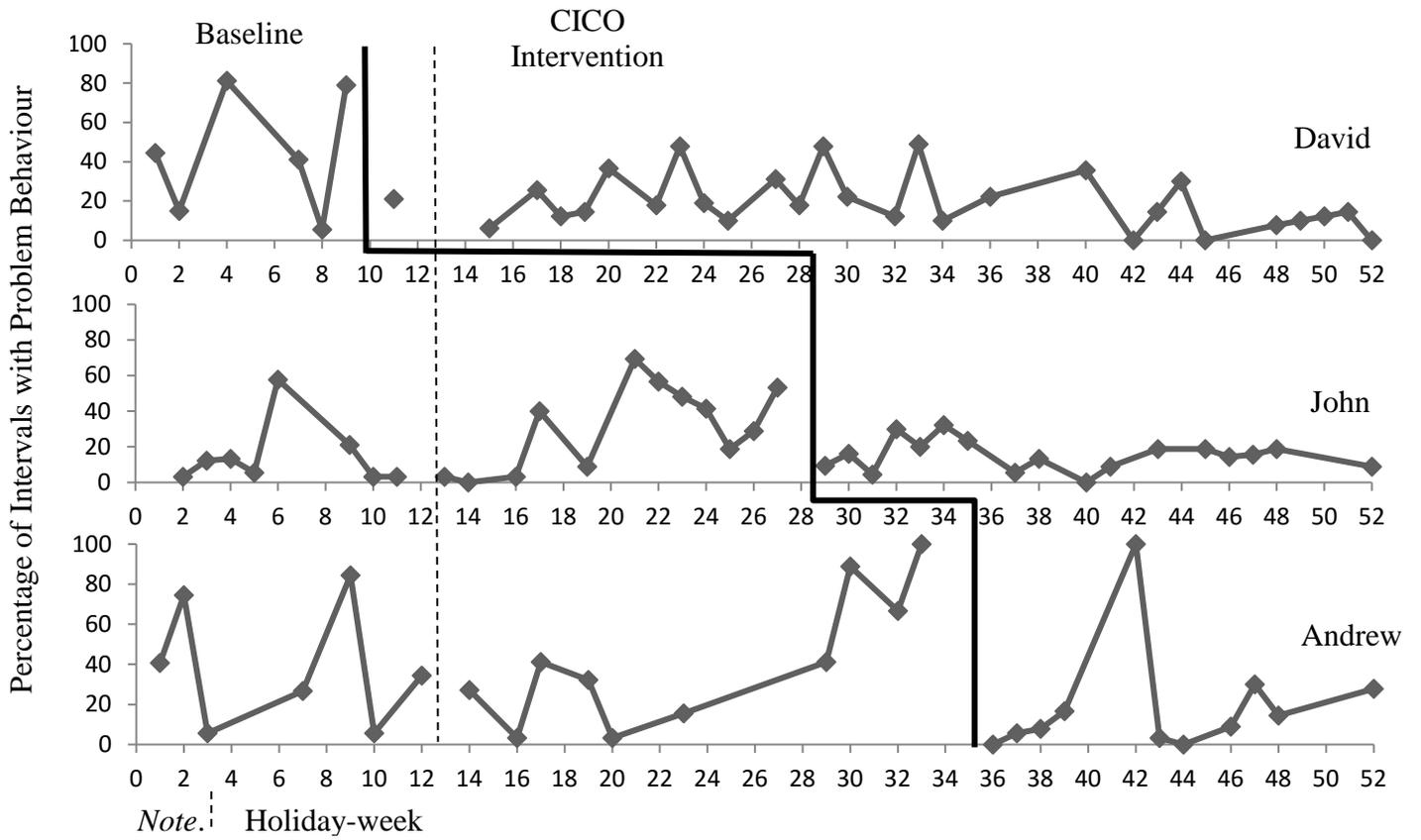


Table 1.*Teacher and parent ratings of the social validity*

		Decrease problem behaviour at school	Increase appropriate behaviour	Be worth the effort required to implement	Be worth recommending to others	Be easy to implement
David	Teacher	3	3	5	5	4
	Parent	1	1	5	6	5
John	Teacher 1	3	2	3	3	3
	Teacher 2	5	5	6	6	6
	Parent (household 1)	5	5	5	6	5
	Parent (household 2)	6	6	5	5	5
Andrew	Teacher	6	6	6	6	5
	Parent	4	5	6	6	5
	<i>mean</i>	<i>4.1</i>	<i>4.1</i>	<i>5.1</i>	<i>5.4</i>	<i>4.6</i>

Table 2.*Pupils' perceptions of support and encouragement during CICO intervention*

Question	David	John	Andrew	Mean
Teachers help me to improve my behaviour	3	1	3	2.3
I have been told how to improve my behaviour	3	2	3	2.7
I have been encouraged and praised every day at school	3	3	3	3.0
I get marks on my DRC every day	4	4	4	4.0
Parents check my DRC every day	3	4	3	3.3
Parents praise me for my good marks every time	4	4	4	4.0
Parents encourage me to improve my behaviour every day	4	4	4	4.0
mean	3.4	3.1	3.4	