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International journal for research on extended education : IJREE 7 (2019) 1, S. 69-85

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The After-School Program Collaboration Quality Index (CQI): Results of a Validation Study

Michelle Jutzi, Rebecca H. Woodland

Abstract: There has been a surge in the demand for the establishment of high-quality after-school programs (ASP) predicated on professional collaboration between in-school and after-school educators (OECD, 2014). In this validation study, we outline the psychometric properties of the Collaboration Quality Index (CQI) comprised of four predominant scales, using data collected from 44 Swiss ASPs and 266 ASP staff members. Internal and external validity findings, as well as bivariate correlations, indicated that the CQI is able to measure specific aspects of professional collaboration that are not accounted for with traditional and stand-alone measurement scales. ASP policy-makers and practitioners are encouraged to utilize the CQI to assess ASPs and use the results to make evidenced-based decisions for improvement.

Keywords: after-school programs, collaboration quality, validity

Introduction

The practice of professional collaboration in educational settings has been the focus of numerous empirical studies, and positive correlations between quality of teacher collaboration, instructional quality, and student learning have been reported (Darling-Hammond, La Pointe, Meyerson, Orr & Cohen, 2007; Lomos, Hofman & Bosker, 2011; Woodland, 2016). However, little has been done to empirically consider educator collaboration in the context of After School Programs (ASP). In this paper, we outline the emergence of ASPs and the fundamental role professional collaboration has within them from a cross-cultural perspective: We elaborate this in the cultural contexts of USA and Switzerland. We then ask the question, whether collaboration is a multidimensional construct which might be better understood by using an index with distinct scales, which independently measure different aspects of collaboration.

According to the Organisation for Office of Economic Cooperation and Development (OECD), after-school programming has become a critical element of school reform efforts worldwide (OECD, 2014). Over the past ten years, there has been an extensive development of ASPs in Switzerland, especially in Cantons with extended urban regions, such as the Canton of Bern (Schüpbach, 2014). In general, ASPs take place before and after regular school hours and offer additional learning opportunities, homework assistance and activities

related to music, art, sports or free play. The activities are often integrated in the school and offered on the school grounds. Nevertheless, the ASP is—according to the government of the Canton of Bern (Ministry of Education Bern [MoE Bern], 2009)—organized as an independent institution inside the school system. Since 2010, every community in the Canton of Berne in Switzerland has to provide ASPs if 10 or more parents request it (ibid.). Due to this external political pressure of the public demand for after-school care, the number of hours of after-school care has increased by 67% between the years 2010 and 2016 in the Canton of Bern (Kull, 2016). Moreover, recent policy-level discussions in the German-speaking countries have called for an increase in the minimum number of ASP hours in which children should participate (Hascher, Idel, Reh, Thole & Tillmann, 2015). ASPs are increasingly becoming an important location for more informal education and care of school-age students during after-school hours in Switzerland (Jutzi, Schüpbach, Frei, Nieuwenboom & von Allmen, 2016; Schüpbach, 2014).

Overall participation in ASPs in the United States has increased by almost 60% over the past decade. Today, 10.2 million children (~18% of all school-age children) participate in an ASP, two million of whom started attending in the last five years (Afterschool Alliance, 2016). The majority of ASPs in the United States are funded in part through the federal 21st Century Community Learning Center program (21st CCLC) (U. S. Department of Education, 2015). Federal investment in afterschool programs has remained relatively stable over the past years—growing a little under two percent, from $1.13 billion in 2009 to $1.15 billion in 2014. Although the establishment of ASPs is widely desired, insufficient federal funds exist to support their creation; $4 billion in local grant requests have been denied via the 21st CCLC program over the past decade (O'Donnell & Ford, 2013). In communities across the United States, 11.3 million children are without supervision between the hours of 3 and 6 p.m.; 1 in 5 children still do not have someone to care for them after school. While participation in afterschool programs has increased, the unmet demand for ASPs continues to rise. In 2014, approximately 19.4 million children (41%) not currently in an ASP would be enrolled in a program if one were available to them, according to their parents. In comparison, in 2009, parents of 18.5 million children (38%) said they would enroll their child in an ASP if one were available, up from parents of 15.3 million children (30%) in 2004.

Professional Collaboration in ASPs

In Switzerland and the United States, ASPs are delivered by personnel, usually an After School Director (ASD) and some number of ASP staff members, who serve the same children, toward the same ends, and in the same building as their school-based colleagues – principals and teachers (Jutzi, Schüpbach, & Thomann, 2013). Public schools and ASPs in the US and Switzerland share the same audience and pursue similar goals of supporting and providing favorable conditions for student learning and development (Jutzi et al. 2016). ASPs are designed as supporting institutions for schools, with built-in structures around homework help, handling students with behavioral difficulties, and heterogeneous classes (MoE Bern, 2009; Sheldon, Aberton, Hopkins, Baldwin, & Grossmann, 2010; Vandell, 2014). ASPs are becoming an integrated part of public education in the US and Switzerland; both countries have faced an exponential growth in the number of ASPs in recent years.

Figure 1: Possible Locations of Professional Exchange Between ASP Staff and School
              Based Personnel
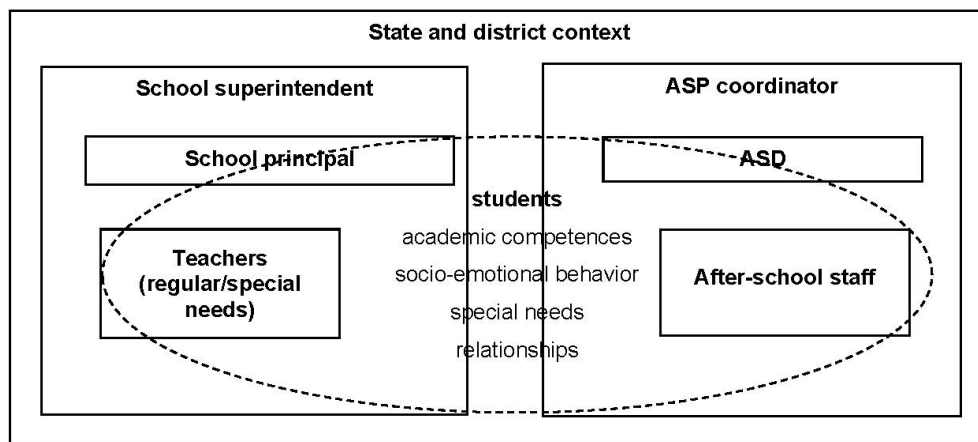
As depicted in figure 1, opportunity for collaboration between school-personnel and ASP personnel can exist on different levels: between the superintendent and the ASP coordinator (if existent), the school principal and the after school director (ASD) as well as between classroom teachers and ASP staff members (Kamski, 2011; Little & Harris, 2003; Noam, 2003). School and ASP personnel collaboration in support of student acquisition of academic competences and pro-social and emotional behaviour, and peer-adult relationships (Huang & Deitel, 2011; Mahoney, Lord & Carryl, 2005). School and ASPs personnel are urged to "join forces" and "integrate the best of teaching and engage youth in active learning" (Gannett, 2012, p. 7) and "to ensure that everyone is working together in a consistent and coordinated way to assist children and youth in reaching their potential" (Massachusetts Afterschool Community [MAC], 2007, p. 31).

Quality of professional collaboration between ASP personnel and school personnel mediates ASP program quality and the likelihood that the ASP will have a positive influence on student-level outcomes (Kamski, 2011; Noam, 2003; Tillmann & Rollett, 2011). By participating in systematic and continuous exchange with their school-based education colleagues, ASP staff and directors can be supported in designing enriching activities, supportive homework assistance and positive social interactions (Rollett & Holtappels, 2009; Holtappels, Lossen, Spillebeen & Tillmann, 2011). Several German scholars in particular argue that professional exchange between ASP and school personnel not only leads to enhanced professionalism of ASP staff, but can also be beneficial for school development (Beher et al., 2007). Mutual enrichment, noticeable relief from work stress and enhancement of competency may be observed when engaging in systematic exchange with ASP staff (Böttcher, Maykus, Altermann, & Liesegang, 2011; Dizinger, Fussnagel & Böhm-Kasper, 2011).

Nevertheless, studies also show that desire for collaboration is much higher for ASP staff than it is for school teachers (Arnold, 2009; Beher et al., 2007; Fischer & Klieme, 2013) and classroom teachers often pragmatically state that they just do not have time to collaborate (Coelen, 2008; Pfeifer, Bergmann & Holtappels 2008; Speck, Olk & Stimpel,

2011). Niehoff, Lettau, Fussangel and Radisch (2014) further discuss that even though exchange happens in practice, teachers report that collaboration with after-school staff does not directly affect their practice. Although ASP directors and staff desire to develop a common culture of collaboration with their counterparts in the school, such professional collaboration is seldom realized in Swiss ASPs (Jutzi et al., 2016).

Overall, scholars agree that professional collaboration is contributing factor to the quality and quantity (number) of ASPs and suggests that future research should focus more on using multidimensional scales to understand and differentiate between assessing aspects of collaborative practices (Hascher et al., 2015; Holtappels et al., 2011). In keeping with this, we argue that federal and state governments as well as independent organizations are in demand to prepare and amplify an overall vision and purpose for ASPs. To establish and sustain ASP program effectiveness, professional collaboration between ASP and school personnel needs to be a focus of scrutiny and systematic improvement. Hence, there is a need to develop a valid instrument to measure and assess quality of professional collaboration in ASPs.

Design and Research Questions

Increasing reliance upon and the establishment of ASPs predicated on professional collaboration to address the needs of children and families necessitates attention to its measurement, evaluation and improvement. Aspects of ASP professional collaboration have been measured using various scales in Switzerland and Germany, but to our knowledge no single comprehensive measurement tool exists, nor has this topic been systematically investigated in other countries, including the United States. In this study we developed and tested the validity of the CQI, an instrument comprised of four scales that are currently used separately to measure: 1) the intensity (IC) and 2) topics (TC) of collaboration, 3) teacher satisfaction with the collaboration (SC) and the 4) process of collaboration (PC).

Research Questions

(1) What is the theoretical and empirical evidence supporting the validity and internal consistency of the four scales?
   a. Do the four scales of the CQI represent valid and unidimensional factors?
   b. Do the participants show variation or consistency in their rating behavior and which implications can be drawn from their answers about collaborative practice?
   c. Are the sub-scales reliable and do the items have high discriminatory power?
(2) What are the findings and implications of the external validation of the scales?
   a. To what extent are the scales and subscales correlated with one another?
   b. What are the practical implications of the association between scales reflecting different aspects of collaboration and what is the benefit of combining them into a common construct of collaboration quality?

Methods

The procedure of the validation study follows the Standards for Educational and Psychological Testing (AERA, APA, NCME, 2014) by presenting theoretical and empirical evidence for the interpretation of data collected from 266 ASP staff. Evidence was based on test content as well as the theoretical basis of the survey items, and on response processes of the participants using explorative factor analysis. Consistency of the scales was examined through reliability analysis and correlative analyses were conducted to account for external validity.

Data Collection

The CQI, comprised of the four proposed sub-scales, was administered in 44 after-school programs in Switzerland in the canton of Berne. Two hundred and sixty-six ASP staff completed the quantitative questionnaire. The sample of ASPs differed considerably in size. The smallest ASP had a team of three people, whereas the biggest ASP team consists of 40 persons. Correspondingly, the number of students enrolled in the ASPs ranged from 38 to 435 students per week. 61% of the staff participating in the study were older than 40 (cumulative percentage of category frequency), had an average of five years of experience working in ASPs and about twice as many years of experience working in the school context. On average, the staff reported working in the ASP about three days a week, a 28% volume of work on average 50% of ASP staff indicated having a background in teacher education, whereas ~30% indicated no educational background working with children (see table 1).

Table. 1: Descriptive Statistics of the ASP Staff Educational Background

	Frequency	Valid percent
Qualified tertiary education	19	9.2%
Teacher education	102	49.3%
Qualified vocational training	29	14.0%
Not qualified	57	27.5%

Note. N=207 ASP staff

Data Analysis

To answer the first research question, we investigated the unidimensionality of the scales by computing an exploratory factor analysis (EFA) (Baltes-Götz, 2013; Field, 2009). In this study, we were interested in the latent factor that explains the correlation between the individual items, therefore we used the Principal Factor Analysis (PFA) and orthogonal factor rotation (VARIMAX). We could not previously assume that the items and factors are systematically correlated with each other, because they stem from different scales and account for the various aspects of collaboration (Rost, 2013). Furthermore, if we could not confirm unidimensionality, we further investigated the structures of the empirically found subscale.

To prove the internal consistency of the scales, the commonly reported psychometric properties, such as reliability and measures of central tendency of the scales are presented

(see appendix tables 1-4, see table 3 for details). Further, the reliability analysis indicates whether the theoretically proposed and empirically tested factorial structure can be replicated in the context of ASPs. We calculated the cronbach`s alpha of each of the scales as measures of the internal consistency and intercorrelation of the items. Furthermore, we looked at the discriminatory power of the items for each scale. The reliability coefficient ranges between 0 (no consistency) and 1 (full consistency). The cronbach`s alpha of the scales should reach at least be between .60 ≤ α<.70 to be at least barely sufficient for further analysis (see table 2).

Table. 2:   Cut-Off Criteria for Reliability Analysis

Reliability Coefficient (Cronbach`s α)		Discriminatory Power (rit)	
α < .50	Impractical	rit < .3	Not sufficient
.50≤ α<.60	In need of revision	.3≤ rit<.4	Barely sufficient
.60≤ α<.70	Barely sufficient	.4≤ rit<.5	Mediocre
.70≤ α<.80	Statisfying	rit≥.5	High
.80≤ α<.90	High		
.α≥90	Very high		

Note. The Criteria refer to the works of Döring & Bortz, 2011

The external validity analysis is used to investigate, whether the rating structure of the participants on the different collaboration scales is systematically correlated. The predicate "external" refers to a comparison between rather than within the scales as represented in the previous analyses. Therefore, we computed bivariate correlations to explore if the four scales of the CQI correlate highly enough to be combined into one instrument. According to (Döring & Bortz, 2011) the Pearson correlation coefficient should at least range between .2 ≤ rit<.5 to represent small or .5 ≤ rit<.7 (see table 2) to represent mediocre correlations between the scales. Smaller correlations would indicate that the scales measure constructs which are too different from each other and measure different concepts. Correlations higher than .7 are only expected between factors of multidimensional scales. Assuming that each scale measures a distinct aspect of collaboration quality and therefore represent the same latent construct, correlations between the scales should be significant.

Results

Intensity of Collaboration (IC)

The scale *intensity of collaboration (IC)* is based on a widely used format in German teacher collaboration research (Maag Merki et al. 2007; Schüpbach 2014-2016). It describes on which occasions and with which actors the after-school professionals collaborate. The scale is differentiated into two subscales which refer to indicators distinguishing between the collaboration inside the ASP (IC_ASP*)* and between the ASP staff and school teachers (IC_SCHOOL).

The reliability coefficient of the intensity of collaboration within the ASP (IC_ASP) is only just sufficient with a Cronbach`s α of .68 and based on a sample of 213 participants (see table 3). The correlations between the items are just above .3 which refers to a small correlation. The item-to-scale correlation is above .3 for all items which suggests that all items have enough discriminatory power. The descriptive analysis on item level shows that the low reliability of the scale might be due to the fact that the items differ considerably concerning their mean and standard deviations. Especially the "informal conversations inside the ASP team" seem to be an opportunity for intensive collaboration, yet the *SD* of 1.10 suggests that the participants differ considerably in their rating of this indicator (see Appendix table 1.). When calculating the sum scores, the scale balances the individual differences and the displays a relatively high mean and rather low standard deviation (*N*=213; *min.*=1; *max.*=5.5; *M*=3.46; *SD*=.70) (see table 3). Therefore, the results concerning the reliability of the IC_ASP scale suggest that one has to use caution when using this scale because of the barely sufficient internal consistency.

On the other hand, the intensity of collaboration with the school (IC_SCHOOL) shows a high reliability with a Cronbach's α of .87. All items have a high discriminatory power above .6 and therefore contribute to the properties of the scale (see Appendix table. 1). The participants report that they collaborate considerably less in informal settings with the school teachers than with the ASP staff on similar occasions (*N*=178; *M*=3.28; *SD*=.85). Only about twice a year, ASP staff use formal settings for collaboration with the teachers such as administrative meetings (*N*= 95; *M*=2.35; *SD*=.99).

Topics of Collaboration (TC)

The scale *topics of collaboration (TC)* has been developed for a previous study in Swiss ASPs and has also been used in a slightly different form in research in German ASPs (Holtappels et al., 2011). Therefore, the *topics of collaboration (TC)* scale measures, whether the collaboration between the ASP and the school is focused on student learning and support. Between ASPs and teachers, collaboration has to be focused on more broad topics which both groups share, like the focus on learning goals (TC_AC) such as mathematics and reasoning, language competence or on other aspects of socio-emotional learning or discipline (TC_SC).

The Cronbach's alpha for the two *topics of collaboration (TC)* scales is high and suggests a satisfying or high intercorrelation between the items of the scales (Cronbach's alpha TC_AC=.77; cronbach's alpha TC_SC=.82) (see table 3). The mean of the individual items is for all items between "rather disagree" (2) and "rather agree" (3), which indicates that some exchange is happening with school teachers concerning certain topics which are grouped in two dimensions of supporting students' academic achievement (TC_AC) or socio-emotional behavior (TC_SC) (see Appendix table 2).

Both scales have good psychometric properties with all item-scale correlation above *r*=.3 and medium item-item-correlations. This indicates that the TC_AC and TC_SC are two separate scales which measure two different concepts and might be used for further analyses.

Satisfaction with Collaboration (SC)

Satisfaction with collaboration (SC) refers to indicators, which reflect how the participants rate the collaboration which is already established between the school and the ASP. Indicators are for example whether they experience the collaboration as rewarding, whether it is successful in their opinion or if the collaboration happens deliberately and explicitly (see Appendix Table 3). The items stem from different previous studies on teacher collaboration (Roos & Wandeler, 2012) and have already been adapted to ASPs (Schüpbach 2014-2016).

The SC scale has reliability of Cronbach's alpha =.84 and the correlations between the items and scale are high (r=.62) (see Table 3). Therefore, all items have a high discriminatory power, which indicates that none of the items should be excluded. The mean of the scale is relatively high (*N*=190; *min.*=1; *max.*=4; *M*=3.06; *SD*=.61) with a rather low standard deviation, which points out that there is not much variance in the answers of the participants (see Table 3).

Furthermore, the descriptive statistics on item level (see appendix Table 3) show that the participants on average agree that previous and present collaboration with the school is satisfactory. Standard deviations range between *SD*=.72 and *SD*=.87 and reflect consensus on the satisfaction with collaboration between the individual participants.

Process of Collaboration (PC)

For *process of collaboration (PC),* participants rated ten items regarding the quality of their collaborative process, i.e. the quality and attributes of shared dialogue, decision-making, action taking, and reflection, on a 6-point likert-scale (Woodland, 2016). They were asked to rate the extent to which each of the statements applied to the established collaboration between school and ASP personnel (see Appendix table 4).

The descriptive statistics of the single items of the two factors PC_GO (goal orientation) and PC_ACT (action orientation) show that especially for the focus on student learning (PC_1), the sharing of information about the decisions in the ASP (PC_5), the knowledge about the guidelines in the school (PC_6) and the coordination of the collaboration (PC_8), the means are relatively high (see Appendix table 4). On the other hand, other aspects such as discussing individual support strategies (PC_2), participation of the school staff in the development of activities (PC_4) as well as exchanging information on student achievement (PC_9) or student's participation in the ASP (PC_10) was mainly rated as "does rather not apply" (see appendix table 3). Therefore, the two scales give us the information about whether the ASPs are more oriented towards a common goal or towards common actions with the school staff.

PC_GO and PC_ACT have very similar consistency structures: a satisfying Cronbach's alpha of .73 or .75 respectively (see table 3). The correlations between the items and between the item and the scale above r=.3. Nevertheless, there exist considerable covariances between PC_9 and PC_10 which might be due to the similar wording patterns. Furthermore, the scale could be slightly improved by deleting PC_4.

Table 3 presents an overview of all the scales and subscales we investigated in this study. The EFA and reliability analyses suggest that the scales might all be used for further studies. Some intercorrelations and side-loadings exist for some subscale items, yet from a

theoretic point of view, it is comprehensible that the items correlate, since individual ratings on self-assessment scales are rarely uncorrelated within individuals. This assumption will be further investigated in the next chapter.

Table. 3:　Psychometric Properties of the Mayor Study Variables

		N^a	M	SD	α	Range Potential	Range Actual	Skew
IC	IC_ASP	213	3.46	.70	.68	1-6	1-5.5	-.48
	IC_SCHOOL	67	2.64	.98	.87	1-6	1-4.2	-.28
TC	TC_AC	229	2.73	.75	.77	1-4	1-4	-.29
	TC_SC	226	2.52	.81	.82	1-4	1-4	-.11
SC		190	3.06	.61	.84	1-4	1-4	-.45
PC	PC_GO	213	3.91	.95	.73	1-6	1.25-6	-.33
	PC_ACT	206	4.39	.80	.75	1-6	1.67-6	-.45

Note. ^{a}The sample size varies due to the chosen procedure of analysis and handling missing data (pairwise deletion) to reflect the sample appropriately.

Testing ASP CQI External Construct Validity

In the following bivariate correlation matrix, we analyzed whether the different scales of collaboration quality are correlated. The bivariate Pearson`s correlation coefficients are shown in table 4.

Table. 4:　Summary of Intercorrelations, Means, and Standard Deviations for Scores on the IC, TC, SC and PC Subscales

	1	2	3	4	5	6	7	M	SD
IC_ASP	1							3.46	.70
IC_SCHOOL	.25*	1						2.64	.98
TC_SC	.12	.22	1					2.73	.75
TC_AC	.19**	.16	.64**	1				2.52	0.81
SC	.02	.37**	.43**	.39**	1			3.06	.61
PC_GO	.09	.05	.37**	.37**	.43**	1		3.91	0.95
PC_ACT	.08	.04	.39**	.32**	.44**	.59**	1	4.39	0.80

Notes: Intercorrelations for the scales of the ASP staff are presented below the diagonal. Means and standard deviations are presented in the vertical columns. For all scales, higher scores are indicative of a positive association between the variables. Sample size varies with the scale due to missingness.
*p ≤ .05; **p ≤ .01 **; p ≤ .001***. Pearson Correlation is significant on 0,05 level (two-tailed). IC_ASP = Intensity of Collaboration in the ASP; IC_SCHOOL=intensity of collaboration with the School; TC_SC=topics of collaboration concerned about socio-emotional factors; TC_AC=Topics of collaboration concerning academic aspects; SC=satisfaction with collaboration; PC_GO=goal-orientation of the collaboration process; PC_AC=action-orientation of the collaboration process.

For each subscale, first, the bivariate correlation coefficients with the associated subscale of the same scale are discussed. Second, we account for correlations between not theoretically associated scales.

The highest correlation is calculated for the association between the two subscales of the topics of collaboration (TC_SC and TC_AC $r=.64^{**}$). The correlations with the other subscales are small but significant and range between $r=.19^{**}$ and $r=.43^{**}$ for the correlation with the topics of collaboration (TC) and between $r=.37^{**}$ and $r=.44^{**}$ for the satisfaction with previous collaborative activities (SC). The second highest subscale correlation is between the dimensions of the process of collaboration (PC_GO and PC_ACT $r=.59^{**}$). This correlation is mediocre with a p-value which is significant on the .01 level (see table 4). Furthermore, when looking at the correlations of the different subscales with the other collaboration scales (SC) and subscales (TC_AC; TC_SC), there seems to be only a slight difference. This suggests that PC subscales similarly account for the process of collaboration and share some of the variance.

Yet, the measures concerning the intensity of collaboration (IC) seem to refer to a different concept of collaboration than the dimensions and scales representing the process of collaboration the subscales only correlate with each other ($r=.25^*$) but not significantly with most other subscales. The only significant correlation of the intensity collaboration within the ASP team (IC_ASP) is with the scale reflecting academic topics in the collaboration with the school (TC_AC; $r=.19^{**}$). This indicates that the more the staff report collaboration inside the ASP, the higher they rate items on the academic focus of collaborative topics. The intensity of collaboration within ASP also correlates with the rating of intensity of collaboration with the school (IC_SCHOOL). This means that if the ASP staff report higher ratings of collaboration inside the ASP team, they exchange information with teachers more often. Therefore, the small but significant correlation coefficient suggests that those two types of collaborative activities might influence one another ($r=.25^*$). Furthermore, the correlations also suggest that the higher the satisfaction with previous and present collaborative practices is rated, the more intensive the collaboration with the school is perceived ($r=.37^{**}$). This correlation indicates that people who have had positive experiences with collaboration with the school also rate their actual practice higher. The direction of the effect as well as assessment-based influences cannot be drawn from these correlative results.

These results indicate that the newly developed CQI measures four different scales referring to collaborative practice, whereas three of them are two-dimensional and can be further divided into subscales. The average correlation coefficients between the subscales and therefore the relevant percentage of explained variance points out, that the scales share similar aspects and show a parallel rating structure in the sample.

Discussion

Overall the results of the validation study confirm our research question that collaboration is a multidimensional construct. Moreover, the subsequent division of subscales might account for distinct, contextually valid and reliable dimensions of collaborative practices and attitudes towards collaboration between ASP staff and school teachers. This study presents empirical evidence that in the sample of 44 ASPs in Switzerland, professional collaboration with school teachers exists already at the moment, but could be improved by focusing on

developing specific content-related aspects of the construct. The sample size of the study (>200 ASP staff from 44 ASPs) accounts for various ASPs contexts. The number of students enrolled ranged from 38 to 435, and the ASP teams comprise of between three and forty people (see p. 7). Therefore, the sample represents small as well as large programs. This suggests that the results presented are not limited to a selective sample of ASPs, but rather reflect collaborative practices in a wide range of ASP settings. In line with previous findings (Arnold, 2009; Speck et al., 2011), collaboration between ASP staff and school teachers remains on an informal level. This is not only reflected in the differing sample means of the items and scales, but also in the high percentage of missingness. Especially for the scale measuring the *intensity of collaboration with the school (IC_SCHOOL)*, the drop in sample size might lead to systematic bias of results when using the CQI in practice.

In comparison, this effect of systematic non-compliance is not present on any other scales. For the comparable indicators for the collaboration inside the ASP, the sample reduction is not observed. Reflecting the difference between informal and formal opportunities to collaborate, Penuel, Riel, Krause & Frank (2009) suggest that access to valued resources, information and expertise might be available in different collaborative situations. Yet, having the resources and opportunity to collaborate -whether in informal or formal contexts - is key to the development of the process in general. Therefore, the results indicate that whereas exchange in the ASP team is already facilitated by frequent informal contact, the opportunity of information exchange with school-based classroom teachers and also its relevance for ASP practice might be restricted by the scarcity of contact. Nevertheless, the concept of the "strength of weak ties" acknowledges that institutionalized, formal collaboration opportunities are not always the most effective (Penuel & Riel 2007). This assumption is also supported by German scholars who argue that the concept of collaboration should be redefined and its conditions and expected outcomes further investigated for ASPs (Hascher, et al. 2015). Collaboration between school teachers and the ASP staff is one with specific characteristics which might not be similar to those of ASP-based teacher collaboration. Nevertheless, collaborative practice might also depend on school level variables, such as the norms concerning privacy, autonomy, conflict-avoidance, and non-interference (Levine & Marcus, 2010, p. 396) which has not been investigated in this study. Therefore, further studies should consider group-analyses to account for similarity between the individuals of one ASP.

The analysis of external validity shows that the ratings of the individuals on the different scales are systematically correlated. For example, people who more often engage in exchange with school teachers also report a higher level of collaboration within the ASP team. Moreover, the correlations between the subscales of the same scale are higher than other reported associations between the subscales, which suggests that it is important to account for the two different content areas in the scales IC, TC and PC: if those factor structures were ignored, this might significantly impact further studies on the predictions of collaborative actions in regression analyses.

Limitations of the Study

The challenge of the operationalization of the construct of professional collaboration is that it relies on the retrospective self-reports of the individuals. This might be one reason why

the effects of collaboration on different variables, such as teacher self-efficacy or student achievement, are not consistent and vary between different samples in previous research (Holtappels, et al., 2011). This discrepancy might be due to the professional differences between the teachers and the ASP staff but also because they rarely meet in their every-day life.

The results of this study further support the assumption that some aspects of collaboration depend on individual conditions and differences such as age or professional background. Individual variances and answering patterns might be present on some of the items reflecting the intensity of collaboration with the school, such as differing roles as "facilitators of collaboration" that individuals occupy and relate to.

This assumption also implies certain aspects of collaboration, such as intensity, can partially be affected by the context of the ASP, leadership practices, and by individual behaviour and professional attitudes. According to Speck et al. (2011) this is one of the most important difficulties faced in attempts to improve and influence collaboration on an institutional level. These variables could be investigated through qualitative methods and inductive interviews that on the staff's perceptions of impediments of collaboration. Also in this study, the self-reported actions and form of the online-questionnaire with standardized items narrows the information that can be elicited, because we cannot control for interpretation processes of the participants. Furthermore, the rating structure might also be affected by social desirability, which could result in a tendency to positive ratings which are skewed to the left.

Conclusion

Previously used stand-alone approaches for measuring collaboration in ASPs (Holtappels et al., 2011) have focused on isolated aspects of collaboration such as the intensity, topic, and satisfaction with professional collaboration in separate scales. Those scales helped the field to understand collaborative practice in the ASP context and gave us information about how collaboration between schools and ASPs are organized. However, these three scales neither illicit information nor give indications as to how the *process of collaboration* could be improved in practice. The results of this study suggest that the process of collaboration can and should be measured to inform ASP improvement. Results of the study indicate strong internal and external validity for most scales. Caution should be used when applying the scale concerning the intensity of collaboration between ASP staff and school staff (IC_ASP). Overall, the results nevertheless suggest that the CQI can be used to reliably measure unique and important aspects of professional collaboration in ASP settings. Results on the CQI may be used to provide direction to practitioners concerned with the quality and professional development in ASPs. In the CQI, information is provided about what could be done to improve the intensity, topics, satisfaction with, and process of collaboration. Program developers, practitioners, and policy-makers can use findings generated through the use of the CQI to make targeted improvements in training of ASP staff as well as the development of ASP quality standards. Since ASPs are important aspects of school reform efforts worldwide, reflections about the collaboration between ASPs and school teachers are core to position the ASPs in the school

system and explore methods of systematic professionalization and development of the ASPs as educational institutions relevant to student development.

The difficulties in scale reliability, missingness and differences in subgroup's ratings provide empirical evidence that assessing collaboration in any systematic research context is an ambitious goal. The construct has many facets and dimensions, representing the intensity of activities, topics as well as individual and collective attitudes toward collaboration.

The relevance of these findings is especially high for practice, action research and intervention studies focusing on the improvement or change in collaborative practices in after-school programming. A validated instrument for assessing key aspect of professional collaboration such as the CQI may be used to stimulate and assess progress toward increasing alignment between ASP and non-ASP based teachers, and the cultivation of a shared organizational culture.

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Appendix

Table. 1: Item Descriptive Statistics and Factor Loadings for Exploratory Factor Analysis with Varimax Rotation for Scales on the *Intensity of Collaboration (IC)*

When do you have the possibility for exchange with your colleagues during your working hours?	N	M(SD)	r_{it}	IC_ASP	IC_SCHOOL
Intensity of Collaboration IC					
IC_1 ...in informal conversations with ASP staff.	255	4.69 (1.10)	.45	.13	**.69**
IC_2 ...in meetings with ASP staff with an administrative focus.	247	2.79 (.68)	.52	.01	**.81**
IC_3 ...in meetings with ASP with an educational focus.	226	2.66 (.87)	.53	-.08	**.82**
IC_4 ...in individual exchange with the ASP director.	243	3.61 (1.21)	.43	.37	**.69**
IC_5 ...in informal conversations with the school teachers.	178	3.28 (1.37)	.64	**.75**	.13
IC_6 ...when attending school staff meetings.	95	2.34 (1.13)	.79	**.91**	-.09
IC_7 ...in meetings with school teachers with an administrative focus.	95	2.35 (.99)	.81	**.91**	.02
IC_8 ...in meetings with school teachers with an educational focus.	95	2.32 (1.08)	.67	**.79**	.09
IC_9 ...in individual exchange with the school principal.	105	2.48 (1.29)	.64	**.71**	.31

Note. Scaling: 1=annualy; 2=twice a year; 3=monthly; 4= once a week; 5=daily; 6= several times a day. Factor Loadings > .40 are in boldface. IC=Intensity of Collaboration

Table. 2: Item Descriptive Statistics and Factor Loadings for Exploratory Factor Analysis with Varimax Rotation for *Scales on the Topics of Collaboration (TC)*

Please indicate, how strongly you agree to the following statements about different topics of collaboration with school teachers.	N	M(SD)	r_{it}	TC_AC	TC_SE
Topics of Collaboration					
TC1 Concerning students with disciplinary problems.	246	2.88 (.94)	.53	.26	**.69**
TC2 Concerning the completion of homework and homework support.	245	3.02 (.96)	.51	**.64**	.42
TC3 Concerning the support of special needs students.	240	2.68 (1.00)	.64	.19	**.68**
TC4 Concerning the support of socio-emotional abilities (for example social inclusion).	237	2.65 (.96)	.69	.09	**.62**
TC5 Concerning the support of mathematical skills (for example calculating).	230	2.15 (.94)	.76	**.89**	-.05
TC6 Concerning the support of linguistic abilities (for example reading, writing, and speaking).	230	2.40 (.93)	.72	**.93**	.10
TC7 Concerning organizational tasks and duties (for example registration and attendance).	242	2.74 (.97)	.42	-.29	**.77**

Note. Scaling: 1=strongly disagree; 2=rather disagree; 3=rather agree; 4= strongly agree. Factor Loadings > .40 are in boldface. TC=Topics of Collaboration

Table. 3: Item Descriptive Statistics and Factor Loadings for Exploratory Factor Analysis with Varimax Rotation for Scales on the *Satisfaction with Collaboration (SC)*

How do you value/appreciate/judge others and your own effort to present and previous collaboration with school teachers?	N	M(SD)	r_{it}	SC
Satisfaction with Collaboration (SC)				
SC1 I try actively to make contact with school teachers.	234	3.09 (.87)	.61	**.77**
SC2 Collaboration with school teachers is rewarding for me.	237	3.30 (.72)	.67	**.80**
SC3 The collaboration with school teachers is successful for both sides.	236	2.97 (.72)	.66	**.79**
SC4 Previous collaboration with school teachers was profitable/successful for me.	206	2.98 (.79)	.58	**.73**
SC5 I have had many positive experiences when collaborating with school teachers in the past.	203	3.01 (.79)	.68	**.81**

Note. Scaling: 1=strongly disagree; 2=rather disagree; 3=rather agree; 4= strongly agree. Factor Loadings > .40 are in boldface. SC=Satisfaction with Collaboration

Table. 4: Item Descriptive Statistics and Factor Loadings for Exploratory Factor Analysis with Varimax Rotation for Scales on the *Process of Collaboration (PC)*

What is the focus of the collaboration with the school teachers and how does it develop over time?	N	M(SD)	rit	PC_ACT	PC_GO
Process of Collaboration (PC)					
PC1 The purpose of our collaboration is to systematically improve instruction and ASP activities to increase student learning.	231	4.67 (1.03)	.35	-.01	.67
PC 2 ASP staff and school teachers make decisions together about how to support student learning.	233	3.91 (1.28)	.51	.24	.70
PC 4 The school principal and school teachers participate in the development of ASP activities.	227	3.27 (1.47)	.64	.49	.27
PC 5 School teachers are well informed about rules and behavior guidelines in the ASP (for example concerning opening hours, activities, homework support; action plans and interventions etc.).	234	4.84 (.96)	.61	.52	.29
PC 6 The ASP staff is well informed about rules and behavior guidelines of the school (for example action plans and interventions concerning disciplinary problems).	243	4.72 (1.01)	.41	.69	.21
PC 7 ASP staff consider teacher`s suggestions in their daily practice.	228	4.55 (1.08)	.46	.63	.29
PC 8 It is clearly defined who is in charge of coordinating the collaboration between school and ASP.	231	4.74 (1.29)	.39	.78	-.13
PC 9 ASP staff and school teachers exchange information about student data (grades, individual learning goals etc.).	228	3.39 (1.39)	.64	.31	.75
PC 10 ASP staff and school teachers exchange information on students` attendance and registration in the ASP.	228	3.68 (1.30)	.45	.47	.61
PC 11 The ASP staff knows how they can reach school teachers and initiate contact.	235	4.16 (1.29)	.45	.69	.25

Note. Scaling: 1=strongly disagree; 2= disagree; 3=rather disagree; 4= rather agree; 5= agree; 6=strongly agree. Factor Loadings > .40 are in boldface. PC=Process of Collaboration