R-Ally: Research Allies for Lifelong Learning

ALLIES Final Year Leadership Report: Part 3, Connections of Critical Thinking Measures with Learner Experiences

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January 2017

VALUEUSA and Research Allies for Lifelong Learning released the final year key quantitative findings of the Adult Learner Leadership in Education Services (ALLIES) evaluation in September (Patterson, 2016a). This report is the third part in a series of final ALLIES reports. Initially programs within states were randomly selected to participate in adult learner leadership training and project. Following training in leadership from VALUEUSA, participating adult learners and staff identified, planned, and implemented a leadership project, such as raising awareness, communications, or fundraising (Patterson, 2016b). Following participation in leadership projects, adult learners with that status were asked, in a final year survey, what they contributed to their leadership project. They also took assessments in critical thinking (CTA; Mincemoyer, Perkins, & Munyua, 2001) and writing. Part 1 of this report series found that in the final year participating adult learners scored higher in Reasoning and Information Processing, two scales of CTA, than did control learners (Patterson, 2016a).

This Part 3 report looks at Reasoning and Information Processing scale scores from the CTA in 2014 and 2015 and the gains adult learners made between first and final years. These gains are important, according to Patterson (2016a) in that they measure approaches of learner leaders in adult education that are valued in leaders in the workplace and in communities (Black, Balatti , & Falk, 2006; Jurmo, 2010; Toso, et al., 2009). For employees to participate fully in the workplace, argues Jurmo (2010), critical thinking and leadership skills are requisite. Adult learners with high Reasoning scores are more apt to think of consequences before taking action, gather information and ideas from others when working on a task, identify and consider options, and give reasons for their opinions. They also tend to be more aware that some questions have no right or wrong answers. Adult learners with high Information Processing scores can frequently tell the best way of handling problems. They can more readily put their ideas in order, compare them, and determine if their information is correct. They have more of a tendency to listen to others' ideas, find supporting information for their opinions, and back their decisions with information (Mincemoyer, Perkins, & Munyua, 2001; Patterson, 2016a).

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*The ALLIES Evaluation was generously supported by **Dollar General Literacy Foundation**. ALLIES received the 2016 Adult Literacy Leadership award from the National Coalition for Literacy. The authors thank Wei Song for reviewing an earlier draft of the report. For correspondence about the report, e-mail Margaret@researchallies.org.*

As recommended in Part 1 of the series (Patterson, 2016a), this report examines how the Reasoning and Information Processing gains relate to learners' aspirations for the future. Gains in these measures of critical thinking may help explain what learners aspire to do next in life. Finally, for participating learner leaders making substantial gains, contributions to leadership projects are also described. These contributions, written in their own words, indicate what they brought to their leadership projects as they improved in these critical thinking approaches and learned to be leaders in programs.

Learner Scores for Reasoning and Information Processing

When Reasoning scores from 2015 and 2014 were compared, averages were very close (Mean= 23.9, SD = 3.8, in 2015 and 24.2, SD = 3.5, in 2014). When averages for Information Processing for both years were compared, there were no noteworthy differences (Mean = 28.4, SD = 5.5, in 2015 and Mean = 28.7, SD = 3.8, in 2014). However, there was higher variability among Information Processing scores in 2015 compared to 2014. In 2015, Information Processing scores appear to be slightly more positively skewed, indicating adult learners tended to take approaches to Information Processing often or always.

This report also considered how variables such as age, gender, employment status, and English Language status relate to the Reasoning and Information Processing scores of learners. Comparisons were made for learner performance in participating and control programs also. Scale scores for Reasoning and for Information Processing on the CTA that participating and control learners (N = 132) took in 2015 were grouped by quartiles into three categories for the present analysis: low scorer (bottom quartile), medium scorer (middle two quartiles), and high scorer (uppermost quartile). Table 1 displays the percentage of scorers in high, medium, and low categories by participation status and for each set of adult learner characteristics.

Table 1. 2015 Reasoning scale category percentages by learner participation and characteristics

	Reasoning Scale Category			
	Low (%)	**Medium (%)**	**High (%)**	**Frequency**
Participating Programs	7.6	49.4	43.0	79
Control Programs	26.4	39.6	34.0	53
Under age 39	7.3	49.1	43.6	55
Age 39 and above	20.8	42.9	36.4	77
Female	11.0	48.0	41.0	100
Male	28.1	37.5	34.4	32
Employed	7.8	40.6	51.6	64
Not Employed	22.2	46.3	31.5	54
English First Language	6.1	48.5	45.5	33
English Not First Language	18.6	44.3	37.1	97

Source: ALLIES final year assessment data (N = 132).

Overall, learners in the participating programs did considerably better than control learners in Reasoning scores in 2015. Of the 79 learners from the participating programs with CTA assessments, 92.4% came under medium or high scorer categories. In contrast, 73.6% of the learners from the control programs were in medium or high scorer categories. This difference indicates that learners participating in leadership training and projects had generally higher reasoning scores after participation, compared with their peers in control programs.

Younger, female, and employed learners also tended to score higher in 2015 on the Reasoning scale. Among learners under age 39, 92.7% scored in medium or high categories while the age 39 and above group scored only 79.3% in these categories. Among female learners, 89% were medium or high Reasoning scorers while 71.9% of males were in a medium or high Reasoning scale score category. Of employed learners, 92.2% scored medium or high while only 77.8% of non-working learners came in this category.

Learners for whom English is the first language also performed better compared to English language learners in Reasoning scale scores. Among English language learners, 81.4% scored in medium and high categories while 94% of native speakers were placed in these categories.

Table 2 presents the corresponding percentages for Information Processing score categories. In terms of Information Processing, learners from participating programs did considerably better in 2015 compared to learners from control programs. By participation status, 87.3% of participating learners and 64.1% of control learners were in medium or high scorer categories. As with Reasoning, this difference indicates that learners participating in leadership training and projects had generally stronger performance in processing information than their peers in control programs.

Table 2. 2015 Information Processing scale category percentages by learner participation and characteristics

	Information Processing Scale Category			
	Low (%)	**Medium (%)**	**High (%)**	**Frequency**
Participating Programs	12.7	39.2	48.1	79
Control Programs	35.8	34.0	30.2	53
Under age 39	16.4	41.8	41.8	55
Age 39 and above	26.0	33.8	40.3	77
Female	20.0	35.0	45.0	100
Male	28.1	43.8	28.1	32
Employed	10.9	39.1	50.0	64
Not Employed	29.6	37.0	33.3	54
English First Language	12.1	51.5	36.4	33
English Not First Language	25.8	32.0	42.3	97

Source: ALLIES final year assessment data (N = 132).

Overall, learners under age 39 performed better in Information Processing. Proportionately more learners in the under age 39 category (83.6%) were in medium or high Information Processing scorer categories than were learners in the age 39 and above group (74%). Females also did substantially better than males in medium or high Info Processing categories (80% vs 71.9%).

When learners were compared by employment status, learners who were employed or self-employed performed considerably better than non-working learners in the medium or high Information Processing scale scorer groups (89.1% vs 70.4%). In the medium or high Information Processing scale scorers groups, learners whose first language was English had higher percentages (87.9%) compared to English language learners (74.2%).

Overall, in both Reasoning and Information Processing, adult learners in participating programs, learners under age 39, females, working learners, and native English-speaking learners outperformed their respective counterparts. Figures 1 and 2 display the high and low categories from Tables 1 and 2 in graphic format.

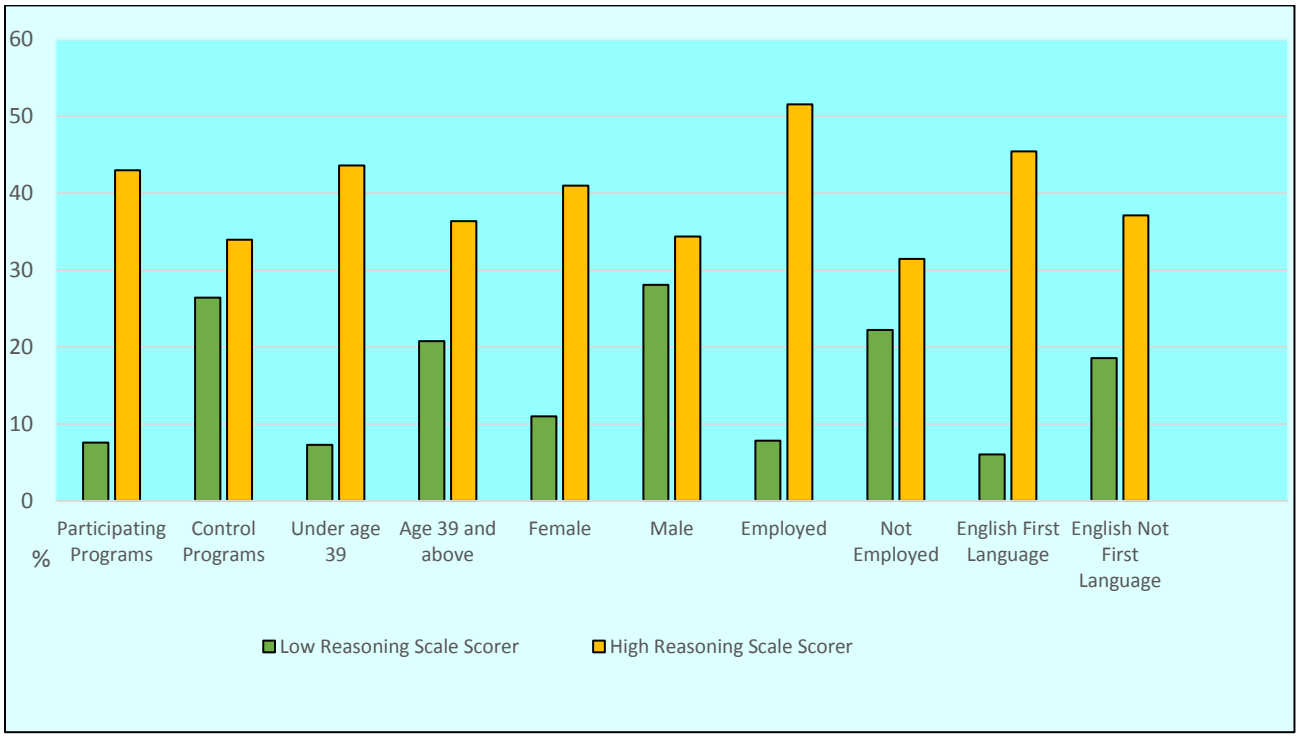

Figure 1. 2015 high and low Reasoning scale category percentages by learner characteristics and participation

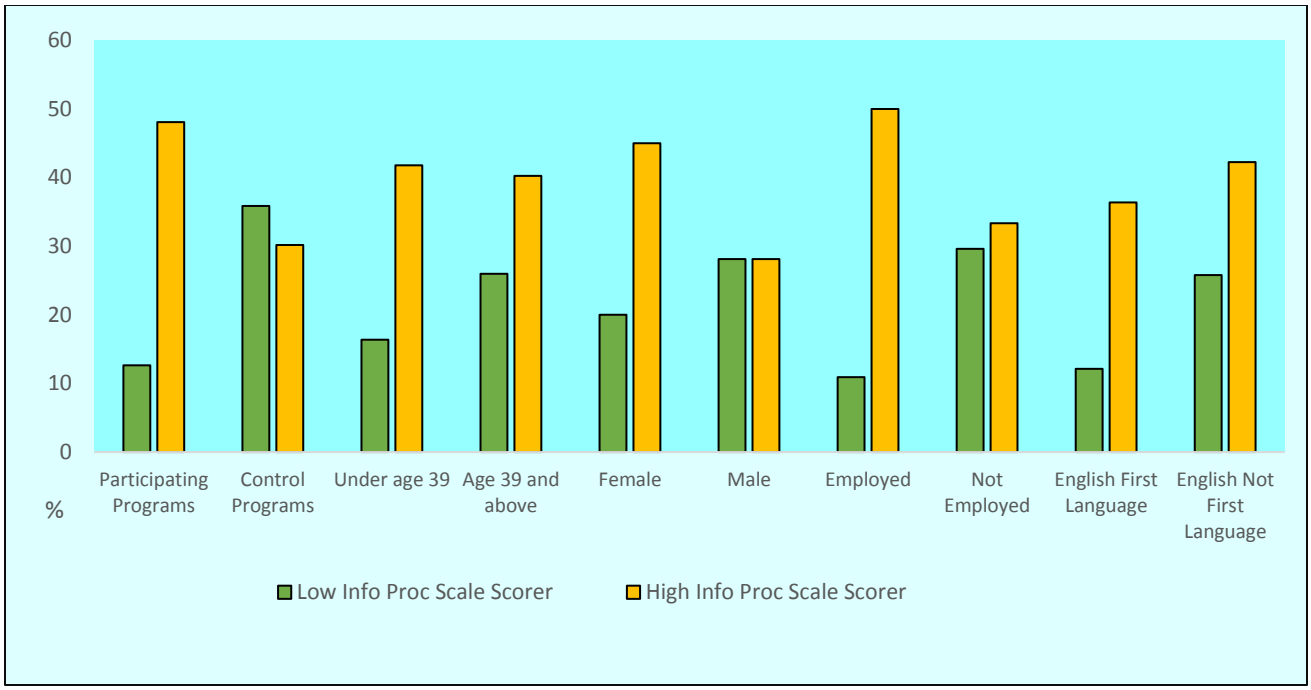

Figure 2. 2015 high and low Information Processing scale category percentages by learner characteristics and participation

Subsequently, score means were examined by participation status and learner characteristics for both scales. By 2015, on average, two groups of learners had higher Reasoning and Information Processing scores than their counterparts, despite having started out in 2014 with similar averages: participating learners and employed learners. Table 3 displays score means and differences for learners by group. Average differences in Reasoning scores for both were small in magnitude. The magnitude of differences in Information Processing was moderate for participation and employment status.

Table 3. 2015 Reasoning and Information Processing Score Comparisons by Participation and Employment Status

Combined Reasoning Scale Scores 2015	**Mean (SD)**	**t Test value**	**p**	**df**	**Difference**
Participating Programs	24.5 (4.3)	2.3	<.05	86	0.41
Control Programs	22.9 (4.5)				
Employed	24.9 (3.1)	2.6	<.05	116	0.48
Not Employed	23.1 (4.3)				
Combined Information Processing Scale Scores 2015					
Participating Programs	29.5 (4.3)	2.9	< .01	82	0.53
Control Programs	26.6 (6.5)				
Employed	30.0 (3.6)	3.0	<.01	80	0.56
Not Employed	27.1 (6.4)				

Source: ALLIES final year assessment data (N = 132).

Gains in Reasoning and Information Processing

Growth in Reasoning scores and Information Processing scores was investigated further. An individual learner's scale score from 2014 was subtracted from the corresponding score in 2015 to identify a gain score, which could be positive, negative (i.e., loss), or zero (i.e., no growth). Those making positive gains from 2014 to 2015 were compared to those making no gain or experiencing loss in scores. The average growth in Reasoning scores was -0.4 (SD = 5.4) for 118 learners taking CTA in both years. Similarly, the average growth in Information Processing was also -0.4 (SD = 6.1). In other words, on average adult learners showed no gain, yet scores varied a lot.

Learner participation and characteristics provide more information about this variability. Figure 3 displays positive gains by learner group. Learners in participating programs, those aged 39 and above, females, those who are employed, and English language learners tended to make positive gains in both scales. Positive gains, however, are not statistically significant given the proportion of adult learners in these categories in the full final-year sample (N = 132). The only exceptions are in Information Processing, by gender and employment status. Men tended to have more negative growth in Information Processing (Mean = -2.3) compared with women (Mean = 0.3), and the magnitude of the difference was small (d = 0.41). Adults who were not working tended to lose ground in this scale (Mean = -1.7), compared with small gains (d = 0.47) of employed learners (Mean = 1.2).

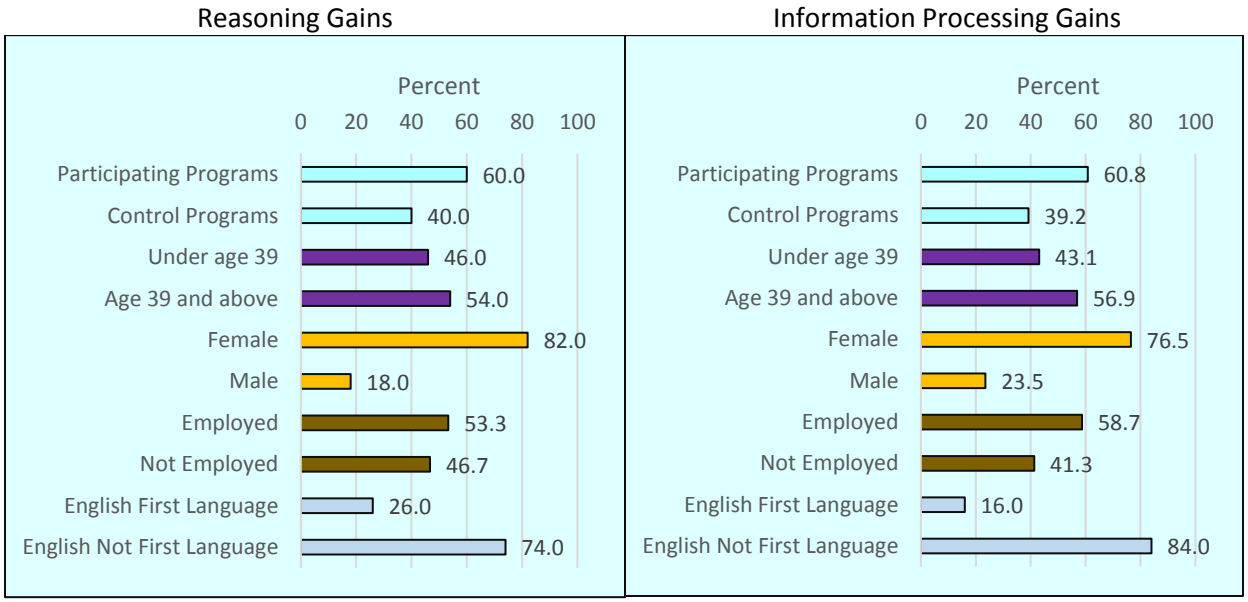

Figure 3. Percentages of positive Reasoning and Information Processing scale score gains, 2014 to 2015, by learner participation and characteristics

Priority Aspirations

Next, the priority aspirations of those who made positive gains in Reasoning scores and Information Processing scores were compared with those making no gain or experiencing loss in scores.

As displayed in Figure 4, a much higher percentage of those who made positive Reasoning gains were interested in pursuing a high school equivalency test next than those making no or negative growth. Those who made no Reasoning gains or experienced loss indicated a higher rate of interest in going to college or university right after finishing the program. No major difference occurred between growth types in getting a better job, keeping the current job, or being unsure about future aspirations.

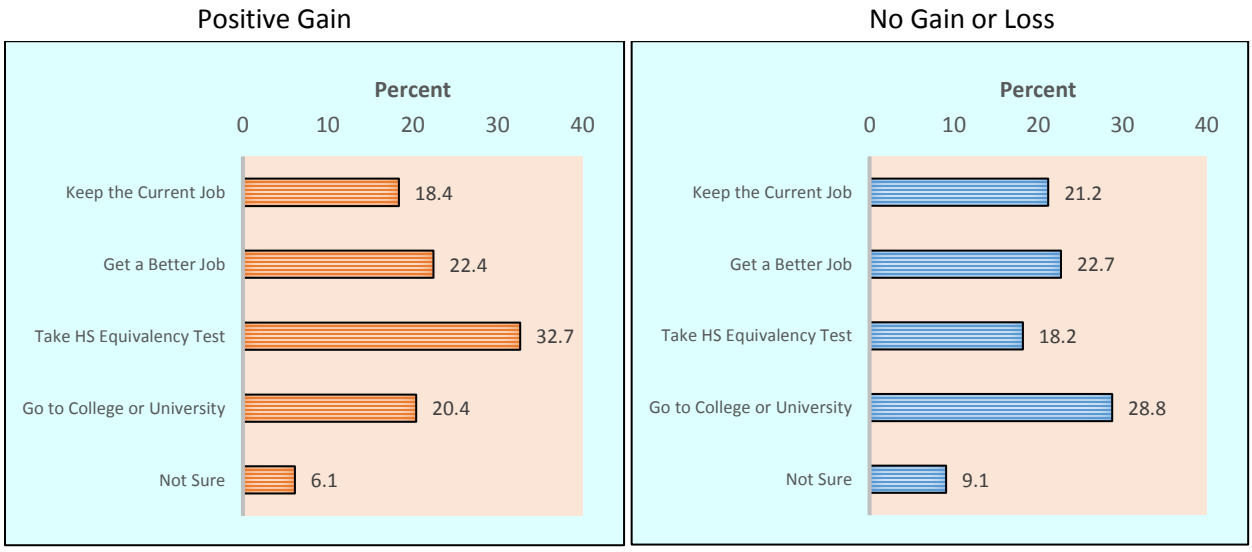

Figure 4. Percentages of priority aspirations by Reasoning scale score gain type

Aspirations of those who made gains in Information Processing indicated higher interest in taking a HS equivalency test next after the program, as shown in Figure 5. Positive growth in Reasoning and Information Processing may reflect gains in critical thinking skills needed to take and pass an HSE test. Those making no gain or showing loss in Information Processing scores had similar rates for aspiring to college or university, keeping the current job, and getting a better job.

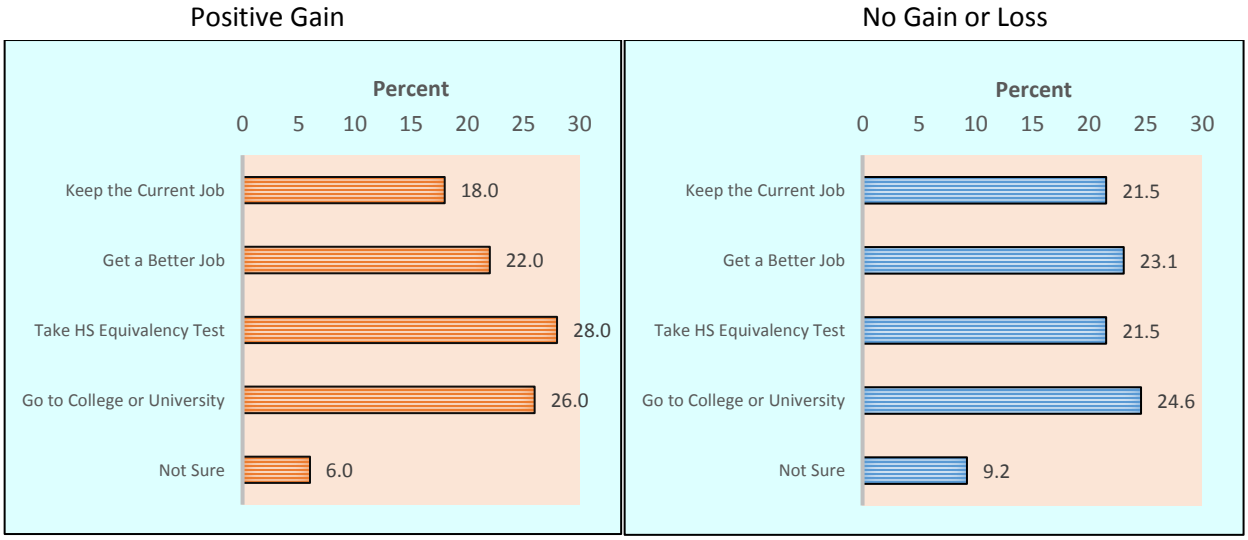

Figure 5. Percentages of priority aspirations by Information Processing scale score gain type

Contributions to Programs of Learners Who Made Gains in Reasoning and Information Processing

In Reasoning and Information Processing, nine participating learners made sizable gains – that is, they made at least an 8-point score gain across both scales from 2014 to 2015. Even though staff in their programs described all of them as strong leaders, seven of the nine learners believed they contributed to the success of leadership projects; two did not describe their contributions. Taking on a leadership role was a new experience for six of them. Even in 2015 the six new leaders rated their leadership skills low, with an average of 5.3 on a 10-point leadership rating scale. As they wrote about their experiences, the seven participants who saw themselves as contributors noted numerous effects on programs through their contributions.

In one participating program, three learners made sizable gains during a fundraising leadership project to refurbish their community-based center. The center's director commented, "All involved contributed to the project in some way. Some got items donated, some worked the [garage] sale, some were in charge of advertising, etc." Another administrator from the center agreed with this remark, listing learner contributions: soliciting items for a garage sale, organizing and pricing items, working on the sale, and taking care of unsold items. Betsy, one of the adult learners, wrote as she "got donations" to refurbish the center, she learned "how to help our school." Both other learners making sizable gains in this center minimized their contributions, instead focusing their comments on classroom experiences. However, all three learners rated their leadership skills as high (average 7.7 points) and in surveys saw themselves as well organized and highly involved in the center.

In a second community-based center, a learner, Marta, contributed to the group's fundraising leadership project by sharing her opinions and assisting at the meetings. Eleanor, who worked on the same project, went to meetings and did everything that she could to make their project a success. She wrote, "I stood and told the rest of the students about what we were doing." She also suggested many ideas to support the project. Blanca, a third learner, contributed by coming to the leadership planning meetings and participating "in projects that the leadership project give to the group." The center's director summarized: "This project gave the students an opportunity with decision making, organization skills, [and] working together with peers..." In surveys, all three adult learners rated themselves as well organized and very involved. However, as new leaders they rated themselves only an average 4.3 on the leadership scale.

The remaining three learners making sizable gains in Reasoning and Information Processing wrote about their contributions in three separate projects. An experienced leader, Bella, wrote, "I contribute with time / organize and prepared the food we were selling," about a fundraising project. She also applied previous knowledge of spending money to learning to "manage money [and] work under budge[t]" in the project. Another experienced leader, Cecile, contributed to a communications project "by giving ideas." For Bella and Cecile, who rated themselves a 9 and 10, respectively, in leadership, leading was not a new experience, yet it benefited their Reasoning and Information Processing approaches nonetheless.

Finally, Saeda worked on a communications leadership project "with big [volunteering]" at her center. She too saw herself as organized and very involved in the center. A new leader, she rated herself a 5 on the leadership scale and did not view herself as a leader but hoped to be one in the future.

Discussion

Participating learners and those who were employed tended to have higher performance in both Reasoning and information Processing scales. Meaningful critical thinking effects in Reasoning and Information Processing by participation and employment status resulted during the time period under evaluation (2014 to 2015). **After working in leadership projects, learners in participating programs tended to have slightly higher performance in Reasoning and moderately higher performance in Information Processing than control learners.** As adults learn new or build on existing leadership skills, they also pick up approaches to general reasoning and development of ideas as well as processing, organizing, and using information in the leadership project. Similar patterns among employed learners are likely not coincidence, in that **employment appears to have enhanced the effect of leadership participation as learners gained approaches to reasoning and processing information on the job. While the effects of leadership on both areas of critical thinking are significant in their own right, supporting leadership in combination with employment – as a requisite to employees' full participation in the workplace (Jurmo, 2010) – shows even more promise.**

For those who are not yet employed, participation in leadership offers them an opportunity to begin to develop approaches to general reasoning and development of ideas, and to processing, organizing, and using information. Capacity to access these approaches could serve them well along career pathways and in a future workplace. Being able to offer these approaches to a prospective employer could also give them an edge in getting a job if they choose to pursue one. Adult educators, especially those teaching employability skills, could apply these findings as they support adult learners in preparing for the workplace.

Another key finding of this report concerns adult learners who did *not* participate in leadership. Even though averages in Reasoning and Information Processing scores started out essentially the same for both participating and control learners, **in control programs, where staff conducted "business as usual", adult learners actually lost ground in Reasoning and Information Processing by 2015.** Even though differences are not large, **were these effects to continue, adult learners could potentially see themselves less prepared to apply reasoning and information processing approaches in the classroom or the workplace.** Adult educators need to identify ways to support development of critical thinking approaches, whether via leadership training or other evidence-based methods.

Regarding learner aspirations, as learners made positive growth in reasoning, they indicated higher readiness for HSE testing next. Since this relationship goes in both directions, learners aspiring next to HSE testing tended to make gains in reasoning. This aspiration appears to be personal and individual rather than reflecting group characteristics. **As they consider consequences, gather**

information and ideas from others when working on a task, and identify and consider options – all elements of reasoning approaches – they are incorporating skills that they may rely on while taking these high stakes tests. It is worth noting that learners making gains in Reasoning and aspiring to HSE testing first did not differ in language status, employment status, or highest educational level in 2014.

Another learner aspiration that differed by growth in Reasoning was entering college or university. Those not showing gain in Reasoning chose this goal more frequently. About half of learners with high Reasoning performance in 2015 already had high performance in 2014 so had little room for growth. Approximately half of learners with no gains in Reasoning already had completed high school or college as of 2014 so would have met that prerequisite for college entry. Growth in Information Processing did not appear associated with aspiring to college or university.

The section of this report on learner contributions found that **most of the learner leaders showing substantial growth in Reasoning and Information Processing approaches were new leaders.** Certainly, as adult learners start to pick up and share leadership skills, not all of them want to or realistically can become the top leaders of a group. **Though they saw themselves as organized and involved in programs as were experienced leaders, these new leaders also tended to rate themselves lower as leaders than their peers with more leadership experience did. This finding suggests that new leaders can acknowledge their own strengths and perceive confidence in their own skills without seeing themselves as top leaders.** Contributing ideas, offering manpower, or keeping meetings productive allow them to practice leadership and boost confidence without necessarily being "in charge." Adult educators who work with learners in leadership settings can thus encourage new leaders to see what they have learned as leaders and how it applies to their role in the center – and how they could apply it to future positions of leadership.

Recommendations for Future Research

Parts 1 and 2 of this ALLIES final-year report series provided quantitative and qualitative evidence to explain the effects of leadership training and project participation for adult learners (Patterson, 2016a; Patterson, 2016b). The first report recommended examining qualitatively what adult learner leaders learned and how they applied that learning while enrolled in the program and after exiting. It also recommended investigating learner leader contributions and what staff noticed about adult learner leader advocacy and mentoring. These topics were the basis for the Part 2 report (Patterson, 2016b). The first report also recommended exploring more fully the relationship of approaches to reasoning and information processing with what adult learner leaders contributed to the leadership project and in respect to with their future aspirations. This Part 3 report has attempted that investigation. These effects are compelling and hold promise for future studies of leadership.

Future qualitative research could more fully evaluate the connections of reasoning approaches with leadership skills and with employment. If leadership program participants were interviewed about the relationship between what they learned as a leader and the reasoning approaches they gained,

further knowledge would be added to this topic that could help educators keep learners from losing ground in key components of critical thinking. Also informative would be answers to specific questions to learner leaders about how leadership related to their work or to their pursuit of jobs and career pathways.

With new leaders showing growth in Reasoning and Information Processing approaches, further research could follow up on their experiences. Reviewing personal attributes that may have supported them as new leaders was beyond the scope of this report. But future research could inquire into how their personality attributes differ from those of experienced leaders. What was it like to be a new leader, both in the adult education program and, if applicable, in the workplace? How did it impact their roles as learner and worker (Jurmo, 2010)? How did the leadership skills they gained through the program benefit their personal growth and their roles in community and family? Addressing these questions would add much to the scant knowledge base on adult learner leadership.

It is also intriguing that two programs, in which six of the nine learner leaders making substantial gains in Reasoning and Information Processing trained in and practiced leadership, were community based. When staff answered the same question about contributions, centers emphasized all learners getting involved and working together to make the project happen. How might these centers differ qualitatively in their approaches to developing and supporting leadership, from other community-based centers where fewer learners made critical thinking gains, or even from other center types? Did the staff in these centers report greater comfort with adult learner leadership and its benefits? To what extent do employers and community groups recognize the program encourages growth in critical thinking and refer future adults to program services (Patterson, 2016a)? While beyond the scope of this report, addressing these questions could be informative to future evaluations of adult learner leadership.

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