Educators' research networks: Applying ego networks and latent profile analysis to characterize opportunity for research use

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Background. A long history of research has documented the gap between research and practice, and in spite of increased demands for research use in educational decision-making, research continues to find weak ties between the two communities. In efforts to bridge this gap, we note that prior literature finds that decision-makers' search for information is often geographically and technically limited as well as driven by relationships and trusted sources (Williams & Cole, 2007; Finnigan, Daly, & Che, 2013; Huberman, 1990; Kochanek & Clifford, 2014; Massell, et al 2012; Penuel, et al, 2017). Drawing on theories of social capital and diffusion theory, we consider the set of resources to which educators turn for information to be an important factor in individual and organizational capacity for research use and use a network approach to measurement. The work presented relies on data from a larger federally funded center seeking to produce a more holistic picture of what drives research use, from the production of knowledge by researchers, to the application of research knowledge in local decision-making processes. Specifically, this paper uses large scale survey data to a) identify the resources school-based educators use to access research-based information and b) develop profiles of resources that characterize individuals and schools.

Data and Method. The Survey of Evidence in Education–Schools (SEE-S) is a 5-part instrument designed to capture the role of research in specific school decisions, perspectives on key gaps between research and practice, networks for accessing research information, capacity to critically consume research, and research brokerage. The survey was administered to all instructional staff in 95 schools in 16 districts between January and June 2019. The network component of the survey was completed by 1,238 educators who reported more than 9,000 individual, organizational, and media sources. Resources were coded to capture the extent to which networks relied on individual, local, external intermediary, or direct ties to research. Using ego network analyses approaches, we examined the size, composition, and heterogeneity indices of individuals networks. Using a subset of these findings, we utilized latent profile analysis in Mplus (Muthén & Muthén, 1998-2014) to classify educators' research networks. We next examined the distribution of profiles across schools followed by a multilevel latent profile analysis that takes into account the nested data structure (educators within schools) and offers information about how educators' networks may shape school capacity for research use.

Results. Educators in our sample relied on a highly diverse and diffuse set of resources in their practice, yielding over 7,000 unique sources. Table 1 provides univariate statistics based on ego network analysis.

Table 1 Univariate Statistics based on Ego Network Analysis

	Mean	SD	Median	Min.	Max.
Network Size	7.42	5.88	6	1	30
Proportion individual	0.60	0.31	0.57	0.00	1.00
Proportion local	0.55	0.32	0.50	0.00	1.00
Relationship to Research					
Proportion locally mediated	0.55	0.32	0.50	0.00	1.00
Proportion externally mediated	0.59	.43	.84	0.00	1.00
Proportion direct	0.07	0.15	0.00	0.00	1.00
Individual index of qualitative variation (IQV)	0.58	0.42	0.75	0.00	1.00
Local IQV	0.49	0.34	0.67	0.00	1.00
Research relation IQV	0.60	0.31	0.57	0.00	1.00

Latent profile analyses revealed four profiles of educators based on their research networks. Profile 1 (n=573, 46.3%), or a *balanced* group, consists of educators who capitalize on both internal and external resources, but have little or no direct relationship to research or the research community. Profile 2 (n=409, 33.0%), or an *internally-focused* group, includes educators whose networks are heavily localized, with virtually no direct interaction with research and much less reliance on external resources than other educators. Profile 3 (n=78, 6.3%), or a *research-dominant* group, relies on local and external (non-research) sources much less than other educators and turns directly to research or the research community much more often. Profile 4 (n=178, 14.4%), or an *externally-focused* group, has a nearly homogenous network of external resources, rarely turning to local or research expertise. Utilizing demographic and background data, we describe key differences in the attributes of members of each profile, specifically highlighting differences in education, exposure to research, and role within schools.

Descriptive data also show that these profiles are not evenly distributed across schools. Table 2 illustrates those differences. For a level 2 or school profile analysis, a relative frequency method was employed, suggesting that a two-class level 2 model is appropriate. We found 9% of schools belonged to a class of schools best described as *externally oriented,* while 91% to a class best described as *internally oriented*. Our descriptions highlight the primary difference - the proportion of the internally- or externally-focused profiles represented in each school. Notably, the profiles are not meaningfully different in terms of research-focused profile representation.

Table 2 Profiles Distribution across Schools

	Balanced	**Internal**	**Research**	**External**
Have at least 1	92.6%	92.6%	49.5%	63.0%
More than 1	82%	78%	17%	40%
Only this profile	5%	5%	0%	3%
Mean proportion	.45 (SD .21)	.35 (SD .22)	.06 (SD .08)	.13 (SD .17)

Implications. Findings from this analysis illustrate, for perhaps the first time at scale, the nature of the resources employed by educators in their practice. While some findings reinforce prior beliefs about research use (e.g. the importance of individuals and local resources), others prompt new thinking about the complexity of educators' networks. What types of networks are "best" for ensuring research enters the deliberative space of decision making? What ways might we intervene to make educators' and schools' networks more inclusive of direct ties to research? How can we leverage profiles and influential resources to better connect research and practice? These findings are instructive on each of these fronts, and we conclude with some suggestions for future research and practice in this space.

References

Finnigan, K. S., Daly, A. J., & Che, J. (2013). Systemwide reform in districts under pressure: The role of social networks in defining, acquiring, using, and diffusing research evidence. *Journal of Educational Administration, 51*(4), 476-497.

Huberman, M. (1990). Linkage between researchers and practitioners: A qualitative study. *American Educational Research Journal, 27*(2), 363-391.

Kochanek, J. R., & Clifford, M. (2014). Trust in districts: The role of relationships in policymaking for school improvement. In D. Van Maele, P. B. Forsyth, & M. V. Houtte (Eds.), Trust and school life: The role of trust for learning, teaching, leading, and bridging (pp. 313–334): Springer.

Massell, D., Goertz, M. E., & Barnes, C. A. (2012). State education agencies' acquisition and use of research knowledge for school improvement. *Peabody Journal of Education, 87*(5), 609-626.

Penuel, W. R., Briggs, D. C., Davidson, K. L., Herlihy, C., Sherer, D., Hill, H. C., ... & Allen, A. R. (2017). How school and district leaders access, perceive, and use research. *AERA Open, 3*(2), 2332858417705370.

Williams, D., & Cole, L. (2007). Teachers' approaches to finding and using research evidence: An information literacy perspective. *Educational Research, 49*(2), 185-206.