Research Deserts: A Systematic Mapping Review of U.S. Rural Education Definitions and Geographies

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U.S. education research about rural places commonly neglects definitional boundaries. Our systematic mapping review of 524 studies approximated how early-career scholars and those new to the rural education research space, including practitioners and policymakers, might experience the literature base and provides a bird's-eye view of how studies tend to define rurality and the types of locations, sectors, and participant roles that they interrogate within inquiries of rural education. We found definitions or demonstrations of rurality in 30% of our sample and little common ground among such studies. For example, 8.59% of studies in our sample applied the National Center for Education Statistics' urban-centric locale codes, still making that the most frequently employed schema. Defining rural occurred about twice as often within articles in rural-focused journals than within non-rural-focused journals, while articles in Journal of Research in Rural Education defined rural nearly three times as often as articles in non-rural-focused journals. Regionally, we found considerable evidence that site selection has tended to privilege the South and Midwest, seeming to desert the Northeast, Upper Midwest, and swaths of the West. Regarding sectors, we found rural research on K-12 education (81%) to be far more prevalent than on pre-K (1.15%) or tertiary education (12%). We conclude with provocations for U.S. education researchers toward a goal of richer scholarship.

Any research field benefits from periodic examination of the body of literature produced within that discipline. Rural education is no exception. Such examinations can take the form of provocations to the field. In U.S. rural education, influential literature reviews have focused on subtopics: students in rural poverty (Khattri et al., 1997), teachers in rural schools (Burton et al., 2013; Meier & Edington, 1983), rural education-focused dissertations (C. Howley et al., 2014), study quality (Arnold et al., 2005), or the history of the "rural school problem" (Biddle & Azano, 2016). Research producers and consumers with an interest in rural education in the United States could benefit from literature reviews that would enable conceptual and geographic mapping in a broader sense.

Accordingly, the current study is part of a program of research that is examining how scholars have studied places that are called rural and the people and schools in those places. It aims to audit peer-reviewed literature that invokes both rurality and schooling. Approaching the well-worn topic of what rural means, we searched carefully and deliberately, seeking a bird's-eye view. Instead of analyzing what *ought to* be studied or how studies *ought to* be conducted, we aimed in the current study to describe what early-career scholars and those new to the rural education research space, including practitioners and policymakers,

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might find when they seek answers to their questions regarding U.S. rural education, particularly if they approach literature uncritically (Penuel et al., 2017), without a robust understanding of multiple ruralities.

Many self-identified scholars of rural education have advocated for thorough, nuanced understandings of rurality. As the current study shows, however, sizable amounts of research in or about rural places fail to describe regional or state nuances that can distinguish among them (Coladarci, 2007; Greenough & Nelson, 2015; Sherwood, 2000). DeYoung (1987) recognized "demographic, economic, administrative, vocational, and community differences and needs existing in many rural regions of the country" (p. 140). He demanded "more particular attention from educational researchers and policymakers if rural schools are ever to achieve their full potential" (p. 140). Helge (1985) identified alignment of rural educators', administrators', and scholars' research priorities. Findings and recommendations from her empirically derived agenda for U.S. rural education research seemed poised to unite scholarship, policy, and practice without ambiguity. Puzzlingly, her work has been largely ignored for nearly 35 years: Google Scholar counts only 26 citations to date even with *Rural Special Education Quarterly*'s 2010 reprint.

We highlighted patterns and gaps in a systematically derived sample of peer-reviewed literature. As we have outlined in our Method section, we compiled our sample by using information-gathering procedures and digital tools that professionals such as early-career researchers, practitioners, and policymakers commonly use. We sought to replicate what such professionals might find as they attempt to collect information on rural education in the United States. In doing so, we found numerous potential avenues for research that aims to inform practice. We undertook a mapping review (Grant & Booth, 2009) of 524 empirical studies of U.S. rural education, affording a scan of how researchers tend to define rurality and the types of locations, sectors, and participant roles that they study when inquiring about rural education.

Our first key finding showed that most studies in our sample provide readers with no sense of what makes a place rural. Second, we found evidence of geographically uneven inquiry, with most studies indicating sites in the South or Midwest and leaving some areas severely understudied (e.g., New England, Pacific Northwest). We discuss how treating such areas as "elsewheres" forecloses possibilities for robust, comparative, place-based scholarship that could interrogate rurality within and across regions. Ultimately, the current study reaffirms rural America as neither uniform nor a metropolitan foil, stressing a need for nuance in the research base. To frame our review, we explore U.S. education scholars' invocations of rurality and their categorizations and imaginaries of regions, which prompted two research questions:

1. How thoroughly and specifically has rurality been defined in studies of U.S. rural education? What explicit and implicit definitions are employed?

2. What locations (i.e., local, state, regional, national, other), sectors (i.e., pre-K, elementary, secondary, K-12 span, tertiary, other), and participant roles (i.e., students, teachers, administrators, other educators, parents, and other school community members) are in/excluded from studies of U.S. rural education?

After detailing tactics for addressing these questions and presenting findings that pertain to both, we conclude with provocations for U.S. education researchers (ourselves included).

Definitions, Geographies, Sectors, and Participant Roles

To warrant these questions, we have briefly examined how scholars tend to invoke and define rurality along with the various and overlapping geographies they tend to interrogate. We also examine a need to study sectoral and participant roles in relation to rural schools.

Invoking and Defining Rurality

Stephens (1985) sought "over-arching research paradigms to guide future inquiry" (p. 169) regarding U.S. rural education. Three decades later, education researchers were still clamoring for greater attention to rural schools and more rurally situated scholarship (Howley & Howley, 2014). Instead, a recent scan of nearly 109,000 research articles published during a 10-year period across the field of education showed that barely 3% of articles under study even invoked rurality, and only 1 in 10 of the studies that invoked rurality defined their use of the term (Thier & Beach, 2019). The number of journals devoted to rural education comprises a minuscule fraction of the U.S. research enterprise, despite rural areas' accounting for half the nation's school districts and nearly a third of public schools. Nationally, about 1 in 7 students attend rural public schools. In 26 states, one third to one half of public schools are in rural areas (Showalter et al., 2019).

A highly influential editorial from Coladarci (2007) offered a blueprint for "improving the yield of rural education research" (p. 1). Endorsing thorough contextual descriptions, he argued vociferously for identifying

the inherent rurality of research phenomena or at least establishing the warrant to cast phenomena as rural. Other scholars have critiqued the typical treatment of rurality as a simple "geographic demarcation rather than as a complex cultural marker" (Howley & Howley, 2014, pp. 14-15). One perennially thorny dilemma that can complicate calls for more precision in rural scholarship is the lack of definitional consensus for the term rural itself (Arnold et al., 2005; Hawley et al., 2016; Stephens, 1992). The *Journal of Research in Rural Education* devoted a 1992 issue to this problem, yet definitions still vary colloquially and within formal policy designations.

In sociology and mental health literatures, Bosak and Perlman (1982) divided rural definitions into four categories: *not stated* (without definition), *verbal* (qualitative descriptions), *homemade quantitative* (quantitative measures without reference to outside agencies or sources), and *external quantitative* (relying on external sources such as census data). While not necessarily complete, we found these categories instructive. Exemplifying the diverse and fraught attempts to define rural, Cromartie and Bucholtz (2008) reported that U.S. federal agencies use more than 20 schemas to distinguish rural places from other geographic locales. Three such definitions have become common approaches for classifying and describing rural schools and communities: those of the U.S. Census Bureau, the Office of Management and Budget (OMB), and the National Center for Education Statistics (NCES; see Koziol et al., 2015).

Per the U.S. Census Bureau (n.d.), a rural area is "any population, housing, or territory NOT in an urban area." Furthermore, this definition dichotomizes Urbanized Areas (≥ 50,000 people) from Urban Clusters (≥ 2,500 < 50,000 people). Curiously, the Census Bureau devised its current qualification of an "urban" place—a population ≥ 2,500 people—in 1910, a time when the Census Bureau counted 92.2 million U.S. residents nationwide. That total is *less than a third* of the present-day total: 328.2 million. By contrast, the OMB considers county-level urbanicity, categorizing counties as metropolitan, micropolitan, or neither, but like the Census Bureau, also considers any residual spaces to be rural. *Micropolitan* counties have an urban area populated by ≥ 10,000 residents; *metropolitan* counties have an urban area with ≥ 50,000 residents (OMB, 2000). Education researchers might be most likely to encounter the NCES (n.d.) definition. Existing in one form or another for about 40 years, NCES produced its urban-centric locale codes as its most recent iteration in 2006. This schema designates all U.S. public school districts and all public and private schools as belonging to one of four locale code groups: c*ity*, *suburb*, *town*, or *rural*. Each locale code group is further classified by either its population size (cities and suburbs) or proximity from urban areas or clusters (see Thier et al., 2020).

Each of these definitional schemas can create what Waldorf (2006) called a "threshold trap." She suggested the development of a spectrum of rurality that she called an "Index of Relative Rurality" (p. 2). A single rural definition might not be possible, or desirable, in the minds of many research producers and consumers, but myriad definitions and their varying interpretations can complicate frequent attempts to apply them in uncontested ways (Longhurst, in press; Thier et al., 2020). Hawley et al. (2016) noted,

> [w]hereas the variability in rural definitions is not an inherent limitation of rural research, failure to adequately define and describe rural makes it difficult, if not impossible to confidently make comparisons, interpretations, or generalizations from the rich body of rural research studies. (p. 3)

Importantly, Donehower (2014) describes rural as more of a "felt" than a "technical" term (p. 168), perhaps a reason that some researchers' interpretations rely on readers' feelings about meaning in ways that become, by necessity, incomplete. Indeed, Shucksmith (2018) encourages rural scholars to look forward to visions of rural that can exist in the present and the future, rather than just in the past. Spanning temporality could help counter the common invocation of tropes such as the "rural mystique" (Theodori & Willits, 2019) or "rural idyll" (Shucksmith, 2018). Moreover, lack of consensus within and between research traditions tends to force researchers into one of two traps that are neither totally infallible nor totally incorrect: (a) prioritizing a quantitative definition that can be employed for generalizability, but is restricted in its ability to provide nuance, or (b) engaging in a thick description that adequately describes the "felt" definition of rurality along with what a place "could" be, as Shucksmith (2018) describes. These traps deposit education researchers between two related predicaments: which definitional schema, if any, to choose, or how to otherwise define a research setting in terms of its rurality?

When rural places are undefined or defined inadequately, they can become mere conceptual contrasts for equally ill-defined cities, suburbs, or towns. Koziol et al. (2015) provided a thoughtful framework to help quantitative researchers choose and implement rural definitions that suit their projects and settings. With a goal of "maximally informative and easily replicable" studies (p. 11), they emphasized theoretical and operational considerations. Likewise, Greenough and Nelson (2015) urged researchers to ponder not only embracing a standardized schema (e.g., NCES's urban-centric locale codes), but comparing sites (demographically, racially/ethnically, socioeconomically, etc.) with shared categorizations. Other researchers argued for considering salient rural-relevant definitional factors

such as proximity to cities and/or school size (Kettler et al., 2016; Thier et al., 2020).

Intentional or not, tacit metropolitan assumptions permeate U.S. education literature (Howley, 1997; Sherwood, 2000). The absence of rigorous, diverse conceptions of research settings can further relegate rurality to a generic and meaningless categorization, thus hampering the potential utility of findings that are dubbed rural. In this way, U.S. rural education research aligns with work from our Australian colleagues (e.g., Roberts & Green, 2013; Roberts et al., 2021), who show rural schools often being cast as deviant from implied metropolitan norms simply for existing outside population centers. Furthermore, anonymizing and generalizing a "particular school in a particular town or neighborhood studied at a particular historical moment" treats each unique location as "a placeless, timeless, representative instance of school" (Nespor, 2000, p. 551). Invisibility then falls over unidentified rural places (already framed as deviant), rendering impossible any attention to what Thomson (2000) calls the "thisness" of place (p. 159) or any counterpoint against the typical residualizing of rurality (Corbett & White, 2014).

Correspondingly, merely substituting the label rural for a robustly characterized place can (at least in qualitative studies) erase "specificities of geography, environment, history and social relations" that could elucidate rural social spaces (Green & Reid, 2014, p. 34). Regardless of methodological tradition, education research benefits from studies conducted exclusively in well-defined and/or well-described rural settings, studies that compare rural settings according to transparent, if not common, criteria, and studies that juxtapose rural and non-rural settings. For example, Ali and Saunders (2006) demonstrated rare skill as they delicately avoided overprescribing a definition of rurality while providing readers enough information to benefit from findings. The authors placed useful boundaries around the insights that readers can glean from their college aspirations study, transparently stating limitations to its external validity. Appropriately, they note that data from 10th and 11th graders in one Appalachian town do not allow comparisons of its "economic, cultural, and geographic characteristics" to other rural places (p. 46) or places where rurality is not salient. Whether describing or comparing settings, communities of participants, practitioners, scholars, and policymakers all benefit when research studies communicate as clearly as possible both which locales pertain to any given study (Thier & Beach, 2019; Thier et al., 2020) and where any explicit or implicit comparisons might end (Ali & Saunders, 2006). Transparent reporting is important across the research enterprise (Dynarski & Kisker, 2014), but it is particularly salient within the subset of the research community that has endeavored to tame a concept that meanders definitionally as much as rurality has done.

Regions Real and Imagined

Scholars wishing to understand the U.S. rural education landscape face two additional complications. Literature on rural education does not seem to distribute evenly across the country. The current study breaks ground by providing data which show that extant research on U.S. rural education represents some places far more than others. Some studies identify their settings at the state level or at the level of identifiable localities (i.e., Texas, Rio Grande border region). In other cases, either in efforts to maintain site anonymity or because studies encompass multiple states, many researchers identify their settings only via broad regional descriptors (e.g., the Mid-Atlantic, the Deep South). However, like definitions of rural itself, regional designations are contested and shifting. Appalachia, for example, remains geographically and culturally nebulous. Its boundaries depend upon perceptions and agendas of those who employ, obscure, or shroud those boundaries in blurriness.

For example, the U.S. Census Bureau (2018) divides the country four ways, each region bearing a definite article (*the* Northeast, *the* Midwest, *the* South, and *the* West), a rhetorical choice that we italicize to underscore an assumed standardization. By contrast, OMB (1997) uses 10 *Standard* Federal Regions (emphasis also ours) that include U.S. territories such as Puerto Rico, which the Census Bureau's regions neglect. According to the Bureau of Economic Analysis (n.d.), the United States can be divided eightfold. The U.S. Energy Information Administration (2012) and the Agricultural Research Service arm of the U.S. Department of Agriculture (2021) have each employed five regional divisions, but their designations diverge.

Beyond governmental definitions, colloquialisms seep into researchers' regional descriptions. Wikipedia—a useful starting point for some inquiries, in part for its aggregation of topic-specific lists—features more than 75 commonly used multi-state or multi-territory regions (e.g., Dixie, Great Basin, or *the* Plains).[1] Geographic boundaries and defining characteristics of these regions are fluid and open to interpretation. Geographers acknowledge the impossibility of optimally "identifying the combinations of physical, socioeconomic, political, and cultural attributes, and the spacio-temporal circumstances … required for

[1] See "List of Regions of the United States" (2020). Although some researchers might dismiss *Wikipedia* as an information source, it has become a leading venue for scholars in fields as consequential as health information (Smith, 2020). Furthermore, *Wikipedia* is certainly a robust portion of typical research consumers' diets on a variety of serious topics in an age defined by digital literacy or its lack (Okoli et al., 2014).

a recognizable region to exist" (Holtkamp et al., 2018, p. 410). Importantly though, Holtkamp et al. (2018) expect scholars to increase knowledge of a region iteratively by studying it from multiple disciplinary and epistemological perspectives, a collaborative effort that our team's program of research aims to support.

Within fraught contexts of real and imagined regions, scholars who consider educative sites as *places* nested in other interconnected *places* have challenged "the policy conception of the school as an hermetically sealed box in which instruction can unproblematically occur" (Thomson, 2000, p. 158). Perhaps this idea seems more radical in education research writ large than among scholars who locate their work along a rural-to-urban continuum. Scholarly conflict in discussions of what "works" within rural places underscores this point (Eppley, 2011; Stockard, 2011a, 2011b). Biddle and Azano (2016) showed how a range of scholars who focus on rural education invoke the need to contextualize every potential solution as rural "problems" (whether those problems are real or imagined), and those problems follow various constructions. Relatedly, Australian scholars Green and Reid (2014) recognized that "educational outcomes, like life experiences, always come from somewhere" (p. 35). We contend that more information about any *somewhere* inherently improves research utility. By no coincidence, many scholars call for understanding *place* as simultaneously real and imaginary, with both aspects being inherently political (Corbett & Donehower, 2017; Green, 2013).

Mapping Sectors and Participants

Finally, we sought to map not just definitional and geographic distributions of the studies we sampled, but also how the rural education literature that we found distributed itself by sector and by participants' roles in relation to rural schools. Identifying geographic and definitional gaps solely is useful only to a point. As researchers, we also need to know whether a given education sector is underrepresented in our region and, within that sector, which participant roles are understudied. As we have noted in our Limitations section, however, our conceptualization of participants in this study is limited in scope. Important demographic distinctions among study participants and their roles within and around rural schools provide nuances that we did not account for in this initial analysis but will address within our program of research. Next, we describe the tactics we used to address our research questions for the current study.

Method

This systematic mapping review adhered to a well-cited typology (Grant & Booth, 2009). The Evidence for Policy and Practice Information and Co-ordinating Centre at the Institute of Education, London, developed this review type to categorize extant literature and identify evidentiary gaps (Gough et al., 2003). Mapping reviews enable quantification of aspects within an evidence base, illuminating priorities for follow-up inquiry. Often using tables or graphs, mapping reviews are meant to yield narrow research questions that are more policy- or practice-relevant than a field can ask currently and/or cogently. Particularly, mapping reviews allow detection of areas or relevant subgroups that are overemphasized or ignored. Thus, mapping reviews can reveal coherency or contours of difference in a literature base, paving a way for further study (Grant & Booth, 2009).

Potential drawbacks of systematic mapping reviews include (a) a tendency to describe topics too broadly, potentially masking heterogeneity; (b) ignoring study quality; and (c) being thwarted by time constraints, each of which we attempted to mitigate. First, a highly specific coding process, such as we have presented in Table 1, can immunize mapping reviews against the oversimplification of contexts that matter. For example, our coding process enabled our attempts to characterize studies definitionally (five vectors), geographically (four), and methodologically (seven), providing descriptive value in the absence of a formal assessment of study quality.[2] Second, we set no time-related constraints in the digital searches we have described below, but functionally our analytical sample included studies from 1985-2017. Third, we sought the unique and overlapping strengths of a relatively large, diverse team of rural education-focused researchers as our coders.[3] Having

[2] The current study addresses seven such vectors. Ultimately, our program of research will address all 16.

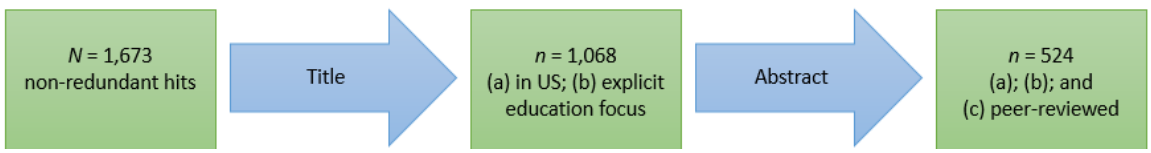
[3] As a research team problematizing the use of regional descriptors, we have intentionally not named our full coding team's home regions. Doing so would require us to employ the very frameworks we identify here as contested and unclear. Instead, we can report that we occupy varying parts within representative slices of the United States. As an illustration, if the lead author were to embark on a driving tour that followed order of contribution, the tour would encompass 7,738 miles and traverse 25 of the 48 contiguous states. If we ordered stops on that route instead for efficiency, the trip would still occupy nearly 3,800 miles and 20 states. Consequently, we feel well-equipped for this social cartography-oriented research, pursuing what Green and Reid (2014) call "an informed geographical imagination" (p. 26).

Table 1
U.S. Rural Education Study Coding Procedures

Category	Aspect	Coding procedure
Definitional	***Rural defined at all***	Coder's judgment of Yes or No
	Explicit/implicit definition	If yes, capture through quotation
	Comparative	Coder's judgment of a study as comparing rural and non-rural settings, not making such comparisons, or being indeterminable
	Rural-specific findings	If any, capture through quotation or paraphrasing to account for variety in articles' various approaches to reportage
	Study keywords	Capture from title page (if applicable) with coders' additional suggestions, as warranted
Geographic	***Level of focus***	Coder's judgment of a study's focus as national, regional, state, local, or other
	Location	Capture by explicit identification or implication from multiple indicators (e.g., suggestions in text and location of author)
	Sector	Coder's judgment of a study's focus as pre-K, elementary, secondary, spanning K-12, tertiary, or other
	Author(s)' institution	Capture from title page for sole/lead author and any others
Methodological	Methodological tradition	Coder's judgment of a study following a quantitative, qualitative, or mixed methods design based on explicit identification or implication based on further description
	Specific method	Explicit identification of research design and/or analytical procedures (captured by quotation, if available)
	Sample vs. population	Coder's judgment of whether a study features a sample or employs population-level data
	Participants	Coder's judgment of a study's inclusion of the following groups: students, teachers, administrators, other educators, parents, others
	Statements of representativeness	If any, capture through quotation or paraphrasing to account for variety in articles' various approaches to reportage
	Statements of generalizability or transferability	If any, capture through quotation or paraphrasing to account for variety in articles' various approaches to reportage
	Journal	Capture from title page

Note. ***Bold and italics*** indicate vectors of interest for the current study.

Figure 1
Process for Including/Excluding Peer-Reviewed Journal Articles on U.S. Rural Education



a large team allowed us to peruse a wide range of literature, while still alleviating the time-related challenge that plagues projects in which reviewers lack resources to map a large sample of relevant literature (Grant & Booth, 2009).

We agree with Howley and Howley's (2014) observation: "rural education scholarship might benefit from the systematic use of a set of filters for gauging precision, usefulness and clarity" (p. 14). However, our decision to make every effort to remain agnostic to any individual study's quality allowed us to canvas the universe of studies that consumers might encounter when conducting uncritical database searches of U.S. rural education. By retaining a large enough sample, we could report overall findings and examine potential variation regarding how and to what extent researchers contextualize places they call "rural."

To produce our analytical pool, we culled articles from nine electronic databases in the ProQuest Social Science Premium Collection regarding education, social science, and/or sociology (see Figure 1). From those databases, we sought articles with "rural*" in their abstracts, "school*" and "educat*" in all fields above the full-text level, and "method*" and either "sampl*" or "population" in the full text, engaging ProQuest's check-box option to return only peer-reviewed articles.[4] Without restricting by year in databases that typically have not yet digitized studies prior to the 1980s, our process produced 1,673 non-redundant initial hits. We purged 605 studies with (a) titles that located them exclusively outside the United States and/or (b) a focus that did not explicitly include education. When our coding team reviewed abstracts and full papers of the remaining 1,068 studies, we further excluded studies that were international (we retained international comparative studies with any U.S. site) or lacked an explicit education focus, yielding a final sample of 524 studies.[5]

As we revisit below in our Discussion, our abstract-level search likely undercounted articles from journals that contain "rural" in their titles; many authors might write as if the rural notion is a given when publishing in outlets that might appeal most to self-identifying researchers of rural areas or rural topics. However, our method approximated searches that could represent how early-career scholars and those new to the rural education research space, including practitioners and policymakers, might experience the literature base when they wade into commonly used digital resources to ask questions about rural education.

[4] ProQuest (2021) defines peer-reviewed articles as those which "go through an official editorial process that involves review and approval by the author's peers (people who are experts in the same subject area)" and notes its use of Ulrichsweb as "the primary reference source to categorize peer reviewed publications."

[5] For a complete list of studies in our sample, please email the lead author (mthier@uoregon.edu).

The current study's two lead authors trained coders to use a standardized spreadsheet to code assigned studies. We randomly selected 20% of studies for double assignment to facilitate interrater reliability calculations of coding efforts, using ReCal (Freelon, 2013) to measure average pairwise agreement and Cohen's κ, the latter indicating reliability above chance agreement. Analytically, we examined descriptive statistics per coding incident, reporting on distributional data in accordance with our research questions. Where appropriate, we analyzed content, using in vivo coding to examine definitional and geographical patterns in nominal, categorical, or otherwise qualitative data (Saldaña, 2015). For example, our in vivo approach to coding enabled us to subcategorize some analyses by whether articles of interest appeared in journals with "rural" in their titles rather than non-rural-focused journals. Given our use of qualitative and quantitative data, we also sought opportunities to integrate data types within joint displays (Guetterman et al., 2015). Specifically, we have offered side-by-side comparisons of descriptive statistics and qualitative data where applicable (e.g., Table 2 and Figure 2).

Findings

We report findings per research question, based on coding that achieved 81% agreement (lead authors resolved conflicts). Agreement-above-chance (Cohen's $\kappa = .79$) fell just short of Landis and Koch's (1977) "nearly perfect" threshold ($\kappa > .80$).

RQ1: How thoroughly and specifically has rurality been defined in studies of U.S. rural education? What explicit and implicit definitions are employed?

A minority of studies in our sample (30%) provided any definition (explicit or implicit) of what made their settings rural. However, as we show in Tables 2 and 3, we found considerable variation in the types of approaches that studies took to defining rurality, as well as distinguishing articles published in rural-focused journals from those published in non-rural-focused journals. The contrasts we uncovered also highlighted important distinctions regarding studies that attempted to compare sites that were labeled as rural and non-rural.

Quantitative Definitions

Among 157 studies that defined rural at all, nearly three in five employed a federal schema such as those from NCES, the U.S. Department of Agriculture, or the U.S. Census Bureau. As a fraction of our 524-study sample, roughly one in six studies used federal schemata, with NCES appearing most frequently. NCES-coded studies tended to feature thorough rationales of internal validity (e.g., Chen et al., 2015; Glover et al., 2016; A. Howley et al., 2011; Jacob

Table 2
Rural Education Studies that Define or Compare in Rural- and Non-Rural-Focused Journals

	Overall (n = 524)	Rural-focused (n = 119)	Non-rural-focused (n = 405)	% difference favors
Defines rurality	30.00	47.89	24.69	Rural-focused: 23.20
Attempted comparisons of rural and non-rural sites				
Yes	21.18	23.53	20.49	Rural-focused: 3.04
No	65.27	67.23	64.69	Rural-focused: 2.54
Indeterminable	13.55	9.24	14.81	Non-rural-focused: 5.57
Exploring indeterminable comparisons				
Rural-specific comparison to group(s) retaining some rural units	Rural in CO vs. rural in IN (Hardré & Hennessey, 2010); Within-rural and/or within-town comparisons based on distance/remoteness (Irvin et al., 2011; Petrin et al., 2014); Excluded city or urban fringe, but unclear if suburban schools were retained for comparison (Henry et al., 2011); Comparisons of whether participants would engage with rurality, not whether they hailed from/lived in rurality (Trickett-Shockey et al., 2013); Unclear comparisons between state's sub-regional populations and urban center (Wheat et al., 2015); Conflates rural with rural/suburban (Horn et al., 2004); "Predominantly located in rural settings" in Northeastern LA (Clark et al., 2015, p. 106)			
Benchmarked to states / nations	Sampled against average-performing schools in NY (Wilcox et al., 2014); Rural OK sample vs. national averages (Shriver et al., 2011)			
U.S. rural vs. non-U.S. rural	US vs. Australia (Eley et al., 2014; Hickling-Hudson & Ahlquist, 2003); US vs. Canada (Dunn et al., 2009); TX vs. India (Byker, 2014); TX vs. Alberta, Canada (Wallin, 2005)			

et al., 2015). For example, Irvin et al. (2011) used NCES codes as inclusion criteria: "Youth in grades 9-12 were recruited from 73 schools with 89% of schools from rural urban-centric locale codes (41, 42, and 43) and 11% from small town codes (31, 32, and 33)" (p. 1229).

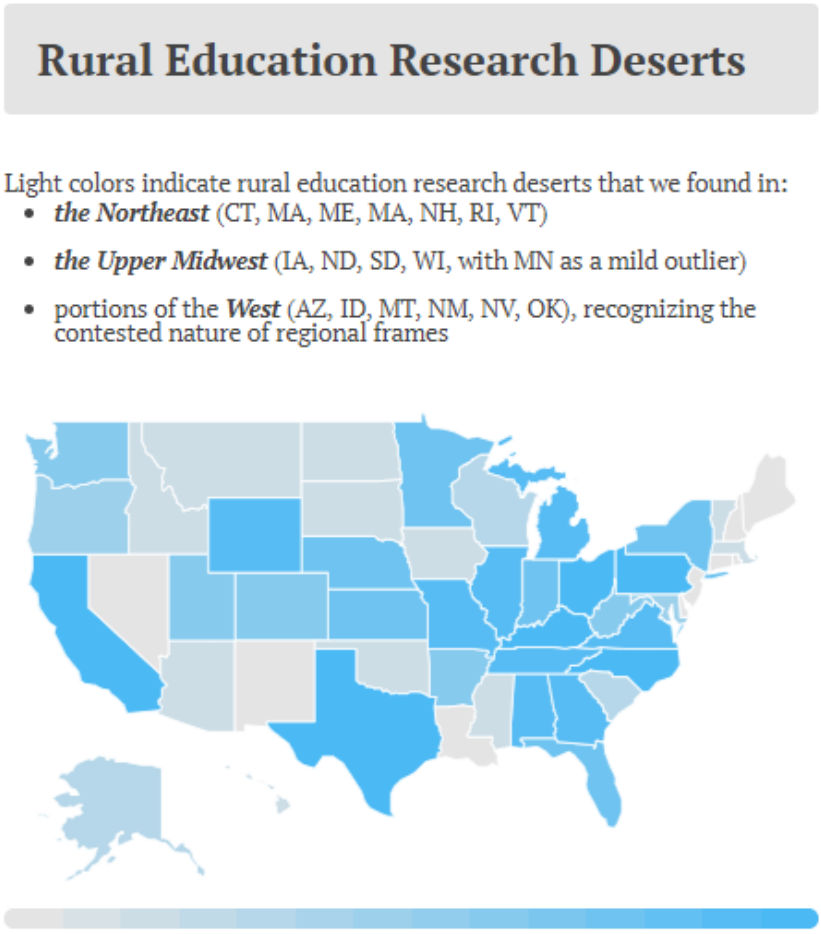
Quantitative descriptions that did not adhere to federal codes (n = 25 studies) described distances from cities or counted populations but never named an explicit definitional schema (e.g., Copeland, 2013; Droe, 2014; Ennis & Chen, 1995; Miller et al., 2011; Smith et al., 2004). Some such studies defined rural by quantifying school enrollments. Miller and colleagues (2011) simply noted that a research site contained a "population of 510 students" (p. 206). Smith et al. (2004) attributed rurality to a "relatively small size (enrollment of less than 1,000)" (p. 77). Another 17 studies adopted their rurality definitions from states, local agencies, or nonprofit organizations (Avery & Kassam, 2011; Grant-Petersson et al., 1999; Reisetter & Boris, 2004). Studies in this category typically cited government policies or initiatives (e.g., Lapan et al., 2003). Some claimed entire states to be "rural" (e.g., Brinegar, 2010, p. 1).

Qualitative Definitions

Nine studies employed thick, qualitative, theorized descriptions to define their research settings (e.g., Ajayi, 2014; Goforth et al., 2017; Pendarvis & Wood, 2009; Sanzo et al., 2011). One example described three rural communities, all with pseudonyms, such as "Grange":

> a small town situated about an hour from the closest moderately sized city.… [Its] history is inextricably intertwined with the textile mill that operated there for many decades before closing in the 1980s. The town itself, including the school, was built for the sole purpose of operating the mill. Grange's school district is comprised of three schools (elementary, middle, and high) that serve students from three different counties. The high school, at the time of the study, included grades 6-12, with the middle school building and the high school building located together on one school campus. The school has one central media center, which also serves as the town's public library. (Hunt-Barron et al., 2015, p. 3)

Figure 2
Mapping Sites of U.S. Rural Education Studies



The authors' description associates the community's historical economic center with its residents' schooling, a vivid example of the thickness that a case study-style definition can provide. Finally, 13 studies that defined rural to any extent did so in very cursory ways (e.g., "The district was in a rural farming area that was slowly becoming a suburban area, and a wide socioeconomic range of students was represented" in Adomat, 2012, p. 3).

Rural-Focused vs. Non-Rural-Focused Journals

As we show in Table 3, there were stark differences regarding the presence or absence of any kind of definition of rural between the 119 articles appearing in journals with "rural" in their titles and 405 articles in journals without such an explicit rural emphasis. Articles in *Rural Special Education Quarterly*, *Journal of Research in Rural Education*, *Journal of Rural Health*, *Rural Educator*, *Rural*

Table 3
*Definitional Types Vary Widely for Studies of U.S. Rural Education (*n *= 524)*

Defined	*n*	Targeted %	Overall % (of 524)
... at all	157		30.00
... using federal schema	88	56.05 (of 157)	16.79
... using NCES codes	45	51.14 (of 88)	8.59
... using non-federal quantitative description	25	15.92 (of 157)	4.77
... using schema from nonprofit, state, or other agency	17	10.83 (of 157)	3.24
... by implication or with cursory detail	13	8.28 (of 157)	2.48
... qualitatively with thick description	9	5.73 (of 157)	1.72
… using a combination of multiple coding schemas and/or definitional approaches	5	3.18 (of 157)	0.95

Note. Targeted % = definitional category's percentage as a proportion of another definitional category; Overall % = definitional category's percentage as a proportion of entire sample (*n* = 524); NCES codes = National Center for Education Statistics urban-centric or metro-centric locale codes.

Sociology, *Journal of Rural Social Sciences,* and research reports published by the American Council on Rural Special Education and the National Rural Health Association—the latter two both being venues that ProQuest incorporated among its peer-reviewed publications—featured definitions 48% of the time. Articles in non-rural-focused journals featured definitions about half as frequently (25%), demonstrating that although the proportion of articles in our sample attempting to define rural remained somewhat low, such attempts were considerably more concentrated within rural-focused journals.

Underscoring the size of the difference we observed by dividing our sample into articles each from rural-focused and non-rural-focused journals, we found only minor distributional differences regarding studies' attempts to compare rural and non-rural sites (i.e., distributional differences all below 6%). Given the distributional similarities for these other variables that characterize studies in our sample, the size of the observed difference between studies published in rural-focused and non-rural-focused journals regarding their proclivity for defining rurality seemed remarkably large. Furthermore, we found rural to be defined in more than two-thirds of articles from *Journal of Research in Rural Education*, nearly three times the rate among articles from non-rural-focused journals and about 20% more than other rural-focused journals. We elaborate upon findings regarding comparative studies in the following section.

Comparative Studies

Due to our recognition of the important link between robust definitions of place and research that compares places, we examined the frequency of studies that compared rural places to other places a study treated as non-rural (see Table 2). Across our sample, less than two thirds of studies neither made nor implied such comparisons, though more than one in five studies specified such comparisons. We observed no differences between articles in rural- and non-rural-focused journals in whether studies made such comparisons. In 14% of studies, we found the articles' descriptions too murky to determine if they had sought such comparisons.

We further categorized examples where our coders could not immediately determine studies for which authors might have intended, implied, or truly made rural/non-rural comparisons. For example, several studies compared rural-specific groups to other groups (a) that those studies conceptualized as entirely rural or (b) that incorporated units labeled as rural and units that were not labeled as such. Studies of this type might be designed to interrogate interstate differences in rural places—perhaps without accounting for possible regional differences (e.g., Hardré & Hennessey, 2010)—or to examine proximity (e.g., Irvin et al. 2011; Petrin et al. 2014). Other studies employed or reported the construction of groups that likely introduced confounding variability about vaguely operationalized places, whether those studies directly compared groups or benchmarked data from rural places against data from

Table 4
Rural Education Studies' Locations, Sectors, and Participant Roles in Rural- and Non-Rural-Focused Journals

	Overall (n = 524)	Rural-focused (n = 119)	Non-rural-focused (n = 405)	% difference favors
		Location		
Local	23.85	20.17	24.94	Non-rural-focused: 4.77
State	38.36	46.22	36.05	Rural-focused: 10.17
Regional	17.94	5.88	21.48	Non-rural-focused: 15.60
National	16.98	22.69	15.31	Rural-focused: 7.38
Other	2.86	5.04	2.22	Rural-focused: 2.82
		Sector		
Pre-K	1.15	2.52	0.74	Rural-focused: 1.78
Elementary	16.60	13.45	17.53	Non-rural-focused: 4.09
Secondary	33.40	22.69	36.54	Non-rural-focused: 13.85
K-12 span	31.30	42.86	27.90	Rural-focused: 14.96
Tertiary	11.83	14.29	11.11	Rural-focused: 3.17
Other	5.73	4.20	6.17	Non-rural-focused: 1.97
		Participant roles		
Students	52.48	48.74	53.58	Non-rural-focused: 4.84
Teachers	27.86	36.97	25.19	Rural-focused: 11.79
Administrators	12.79	17.65	12.79	Rural-focused: 6.29
Other educators	10.69	12.61	10.12	Rural-focused: 2.48
Parents	6.68	7.56	6.42	Rural-focused: 1.14
Other school community members	6.30	15.97	3.46	Rural-focused: 12.51

Note. Proportions for participants' roles do not sum to 1 because some studies feature data from more than one type of participant role.

broader jurisdictions (e.g., Clark et al., 2015). In other instances, scholars compared U.S. rural places to other countries' rural places, raising potential validity questions as notions of rurality likely entangle with cultural and geographical factors that can intersect with jurisdictional and/or national boundaries (e.g., Eley et al., 2014).

RQ2: What locations, sectors, and participant roles are in/excluded from studies of U.S. rural education?

As we show in Table 4, a state-level focus accounted for a plurality (38%) of the studies in our sample. Studies at local, regional, and national levels occurred with roughly the same frequency as one another (17-24%). In subsequent sections, we elaborate upon patterns of variation among these studies, which often emphasized states or regions, specifically showing our sample to favor the South and Midwest and to disregard much of the rest of the United States. Moreover, studies of the K-12 sector overall, specifically secondary schools (i.e., middle and/or high schools; 33%) and studies that covered the K-12 span (31%) predominated our sample. By contrast, studies set in elementary schools (17%) or that interrogated tertiary (12%) or pre-K education (1.15%) were considerably less common. Furthermore, studies that incorporated students (52%) occurred in our sample about twice as frequently as those incorporating teachers (28%). Studies that incorporated administrators (13%), educators other than teachers or administrators (11%), or parents (6.68%) were relatively less common.

States

State-bounded studies occurred 10% more frequently in articles within rural- than non-rural-focused journals. Among state-bounded studies overall, a substantial majority

occurred within a state that the study named (79%), but often offered no further description to gauge the study site's (or sites') potential representativeness relative to that state or the degree to which a location within that state offered local features that research consumers might identify as rural. Some studies explicitly claimed entire states to be rural, such as Montana (Atkins & Cummings, 2011), South Dakota (Reisetter & Boris, 2004), and West Virginia (Courtade et al., 2010), or made such implications (e.g., North Dakota in Strand, 2013). Others indicated the extent of a state's rurality, such as Carver et al.'s (2005) ranking of Mississippi as the "fifth most rural" state (p. 35) without providing a basis for any state's geographic ranking.[6]

Some studies synched nebulous depictions of a "rural state" to equally ambiguous regions such as studies in a "rural Western" and "frontier" state (Winnail et al., 2005, p. 329), a "geographically large rural state in the Northern Rockies" (Shroyer & Stewart, 2016, p. 376), or "two predominantly rural western states" (Yarger, 2001, p. 18). Some studies gathered data that touched "34 states in all regions (West, Midwest, South, and Northeast)" (Huynh et al., 2015, p. 1) or "12 diverse states" (Gaumer Erickson et al., 2012, p. 24). The latter reported that the two most prominent states in their studies came from the Midwest or Northeast, without defining either region.

Meanwhile, few states in our sample have hosted enough studies to facilitate state-specific bodies of knowledge that could serve the needs of state-focused research consumers (e.g., policymakers or program implementers in that state) who might derive a sample of this kind using digital databases and similar search parameters to ours. Comprising a wide range of topics and participant roles, nine states appeared in 10 or more of our studies: Texas, 26; North Carolina, 22; California, 19; Pennsylvania, 18; Ohio, 16; Kentucky, 14; and Alabama, Illinois, and Tennessee, all with 10).

Although 10 studies in a single state might seem adequate to tell a story about rural education there, consider the case of Illinois. Someone who culled a similar sample to address their interests about what is known regarding rural education within Illinois might experience an indecipherable range of tangentially related topics across the 10 studies we found. That range included one study each on community perceptions of math education (Lucas & Fugitt, 2009), library access to information on health science careers (O'Brien & MacDowell, 2015), service-learning among university students (DeMattei et al., 2012), and parental attitudes on sex education (Welshimer & Harris, 1994). If the Illinois-focused rural education research consumer narrowed the focus to elementary schools, the following one-off study topics would appear: student tobacco use (Sarvela et al., 1999), food supervisor nutritional practices (Sherry, 2008), and socioeconomic status predicting academic performance among third-to-fifth graders (Renth et al., 2015). An analogous search regarding secondary schools would produce research about topics as diverse as suicide prevention (Walker et al., 2009), students' attitudes toward science (Kitts, 2009), and all-terrain vehicle safety (Novak et al., 2013).

Research consumers in New Jersey or Rhode Island—both states for which NCES coded more than 10% of their public-school populations as rural—who followed search methods like ours might not even be able to access such a mashup of rural-related findings scattered across topics as Illinois-interested consumers might enjoy. No studies in our sample featured rural education in either of those East Coast states. Per state, our sample $M_{studies} = 6.54$, but a comparatively large *SD* (5.71) suggests considerable variability in how much attention for their state anyone might expect from a comparable literature search (see Figure 2).[7] According to Showalter et al. (2019), 13 "leading priority states" deserve the most attention regarding rural education. However, we found limited scholarly attention for 10 of those 13 leading priority states within our sample: Louisiana with one study; Arizona with two; Mississippi, Oklahoma, and South Dakota each with three; South Carolina with four; Arkansas and West Virginia each with six; Florida with eight; and Georgia with nine. The leading priority states that received comparatively more attention among the studies in our sample included Alabama, Kentucky, and North Carolina.

Additionally, many other states that some research producers, and especially some consumers, might assume to have relatively large proportions of schools in rural settings seem to be similarly neglected. Based on our sample's state-specific distribution of studies. Hawaii and Iowa had three studies each, both eclipsing Idaho, Montana, North Dakota, and Vermont (two each) and Maine, New Hampshire, and New Mexico (one each). In total, many states that research consumers (and producers) might identify intuitively as containing large numbers of rural places would seem to be research deserts for a similarly derived sample. The absence of study availability from a digital search such as ours could impair acquisition and/or production of knowledge regarding the state of play for education in the rural communities that exist there. Of further interest, several studies we identified as local-level inquiries included sub-regional or otherwise narrowed portions of states, such as Alabama's so-called Black Belt (Robinson et al., 2014), Maryland's Eastern Shore (Baquet et al., 2013), New York's Catskill Mountains (Avery & Hains, 2017), or directional

[6] As contested as definitions of rurality itself, ranking rural places can be equally problematic, a topic we explore further in the Discussion section.

[7] We do not argue that any one state should serve as a proxy for rurality or vice versa. Rather, our study has revealed demonstrable gaps that we can identify at a state level even though we recognize states might not be the most useful unit of analysis.

areas such as Northeastern Nebraska (Dalla et al., 2006). These studies provided some degree of added context to guide research consumers regarding their potential for state-level representativeness (or lack thereof).

Regions

Regionally, we observed 31 designations, often without clear boundaries for those designations (e.g., "the rural Northeast" in Methe et al., 2008, p. 363). Most regional studies alternatively occurred in one of four quadrants. Studies of the South might also reference (Deep) South(ern), South Central, Mid-South, Southeast(ern), Southwest(ern), or the (Mississippi) Delta. Studies of the Midwest might also reference (Upper) Midwest(ern), as well as the High or Northern Plains. Studies of the East might also refer to Eastern, Northeast(ern), or (Northern) New England, and the West might include the Western, (Pacific) Northwest, or Frontier.

Among those quadrants, studies in the "South" and related designations were most common. Framings of Southeast(ern) settings accounted for more than half of 55 "Southern" studies in our sample. One such study claimed to be set in a "poor, rural Carolina Piedmont community" (Knotek, 2003, p. 4). North Carolinians might recognize the reference, but other readers could assume the setting to be South Carolina. In fact, the U.S. Geological Survey (2018) has described the Piedmont as a plateau region between the Appalachian Mountains and Atlantic Coastal plain, from New Jersey to Alabama. More commonly, "Southern" studies in our sample provided minimal state or local specificity. In 41 "Midwest" studies among those that we coded for this inquiry, that region could at least contain all or parts of Kansas (Marrs & Eccles, 2009), South Dakota and Wyoming (Hovland et al., 2011; Strand, 2013), and potentially Minnesota, Nebraska, and North Dakota (Keengwe et al., 2012; Lewis et al., 2007). Far fewer studies that we reviewed claimed the "East" (14) or "West" (nine) as their settings.

Additionally, some studies in our sample occurred in regions that traverse seemingly arbitrary borders, which the South-Midwest-East-West quadrants are meant to obey. Cross-cutting regions included (Northern) Appalachia (12 studies), some of which identified parts of Kentucky (Hlinka, 2017), Ohio (Hendrickson, 2012), and North Carolina and West Virginia (Horn et al., 2004) within a stereotypical and default proxy for rurality. Somewhat paradoxically, though, one of the seven studies we found that described its region as including Mid-Atlantic states also featured West Virginia alongside Maryland and Virginia (Weist et al., 2000). Further compromising regional clarity, one study self-located as both Mid-Atlantic and Southern (Hulton, 2007). Three studies in our sample occurred in the Rocky Mountains, which might bound the Midwest or be a Western gateway. Importantly, we found studies that we coded as "regional" nearly four times less often in rural- (5.88%) than non-rural-focused journals (21%).

Sectors and Participants

Regarding sectors, we found nearly no attention to pre-K education (1.15%), though proportionally about four times more so in rural- (2.52%) than non-rural-focused journals (0.74%). Still, the exceptionally low base rates of pre-K education in our sample overall suggest a lack of scholarship that is germane to rural education among the youngest learners. Our sample demonstrated that early-career scholars and those new to the rural education research space, including practitioners and policymakers, with an interest in pre-K education in U.S. rural settings might find little relevant published research.

A noteworthy exception, Murphy et al. (2013) applied the U.S. Department of Agriculture's Rural-Urban Continuum Codes (2020) to a nationally representative data set, reporting statistically significant differences in favor of rural over urban teachers for their use of practices to transition children and families from community- to school-based services. Otherwise, conducting a search like ours would unearth bits of knowledge, such as that families in urban Southwestern Missouri perceive greater engagement in Head Start than families in rural Southwestern Missouri (Keys, 2015), or that response-to-intervention and positive behavioral interventions and supports show preliminary effectiveness in one rural county somewhere in the Southeast (McClain et al., 2012) or in one rural area somewhere in one Northeastern state (Steed et al., 2013).

Elementary education accounted for about half the proportion of our sample (17%), as did secondary schools (33%). Comparatively, studies in our sample from rural-focused journals were 15% more prone to characterize their educational sectors as occurring across the K-12 span rather than at a specific level (i.e., elementary or secondary) unlike non-rural-focused journals. Overall, studies of tertiary education accounted for 12% of our sample.

Considering participant roles as units of analysis, students were the most-frequent research target (52%). Teachers, the next most frequently included participant role, were included about half as often as students overall (28%) and we saw a noticeable difference in studies that favored rural-focused journals by 12% over non-rural-focused journals. In our sample, studies incorporated administrators (approximately 13%) about as often as other educators (approximately 11%), a group that included community members, schools, or researchers themselves as units of analysis. As evidenced by participant role percentages totaling more than 100%, several studies featured more than one of the participant roles for which we coded the studies in our sample.

Discussion

Popular and research journals in education and disciplines ranging from sociology to psychology to health sciences devote many pages to debating the desirability/utility of consistent vs. varying definitions of rurality. Most recently, Crampton (2019) pointed to the absence of a "one-size-fits-all definition" amid U.S. federal programs' considerably diverse needs to constitute communities as rural (para. 5). Into that fray, our systematic mapping review identified gaps in the *what*, *where*, and *who* of U.S. rural education research, aiming to set aside *why, how,* or *how well* relevant studies were done. Striving for agnosticism to study quality, we built and examined a large enough sample of relevant studies that early-career scholars and those new to the rural education research space, including practitioners and policymakers, might find in their own digital searches, highlighting substantial variation in researchers' approaches to interrogating and reporting on rural. Scanning definitionally and geographically, our findings can show the field many of the places where it has (and has not) been, and perhaps provide ideas for future destinations in U.S. rural education research.

Definitions

Our study affirmed previous findings regarding the overall murkiness that typically surrounds the employment of rural as a term (Arnold et al., 2005; Thier & Beach, 2019). Unsurprisingly, we found rural-focused publications, especially this venue, to define or describe rural places far more readily than journals without a rural emphasis. When definitions are present, however, the bulk of studies we reviewed adhered to federal codes. Very few studies that invoked those federal codes followed recommendations about rationalizing the choice of one schema over the many that are available (Koziol et al., 2015). Choosing a coding schema and arguing for the alignment of that choice with a study's purpose can add meaning to what otherwise might just be a geographic label. Meanwhile, intentional and transparent employment of a coding schema can foster useful, valid comparisons within a study (Thier et al., 2020) or against an overall corpus of literature, allowing the community of research consumers and producers to learn collectively.

Of course, predetermined codes do not suit all research purposes, particularly qualitative ones. Instead of researchers' positioning ourselves as arbiters of how rural ought to be defined within a specific investigation, we echo Roberts (2014), who encouraged "rural" to become "more than a setting for research or a point of difference justifying publication. Instead it should be generative for, or pertinent to the purpose of the research, and more than a category of description" (p. 135). We found thick, rich descriptions to be exceptionally rare in our sample. From points of view among research consumers and our fellow researchers, we all benefit when studies "outline why this specific setting is more appropriate than others for the conduct of the study. What is unique? What characteristic of this setting are compelling or unusual?" (Marshall & Rossman, 2014, p. 100). Without robust context, popular assumptions, stereotypes, and mythologies about rurality can influence readers' interpretations and perpetuate misconceptions about the uniformity of rural places. For example, Hartman's (2017) otherwise thoughtful examination of an Appalachian teaching partnership implies its case-study school to be emblematic of other rural places, seeming to follow an assumption that readers share her rural conceptualization and that rural places necessarily share a full complement of traits.

Furthermore, program evaluators might feel pressure to uncritically adopt jurisdictional or organizational rural labels for the sake of expediency, but even locally salient definitions can be lost on national or global audiences who have not been *there*, wherever *there* is. Designating a community as rural per an agency definition, without examining its development, might deny readers the full stories that data can often tell. As challenging as the tendency that we observed toward simplistic treatment of rurality, generalizing rural contexts might be undesirable, if not thoroughly impossible (Azano, 2011; Green 2013; Longhurst, in press; Zuckerman, 2019).

Geographies, Sectors, and Participants

We found copious evidence in our sample that whole regions and states could be overlooked if early-career scholars and those new to the rural education research space, including practitioners and policymakers, applied similar search methods, hence our designation of research deserts. The places where rural education research is (and more importantly, is not) conducted matter. Most of the data we reviewed came from the South and Midwest, unearthing several potential blank spots across a swath of the knowledge map of U.S. rural education, notably the Northeast and the West. We recognize regional constructions to be fraught, acknowledging the field's lack of consistency in describing where is where, although noting a greater tendency among studies in non-rural-focused journals to invoke notions of region. Thus, we neither advocate for all scholars' endorsing one set of regional descriptors, nor eschew the value of conflicts regarding such descriptors. Without making a value judgment, we are merely describing a seemingly nebulous literature base that might benefit from discussing whether Virginia exists in the Mid-Atlantic, Appalachia, neither, or both. In fact, we would welcome a study that presented a Virginia school as existing simultaneously in both regional frames, examining the unique and overlapping

thisnesses of those places. The far more regular occurrence that we encountered in our sample, however, was that of unexamined, unexplained, uncontextualized studies—especially in the geographic clusters we identified—necessarily punting much place-based understanding to studies' readers, not as an authorial responsibility.

When studies offer no sense of where the research occurred, they can deepen or widen holes in areas about which we already know too little. For instance, there seems to be no agreed-upon way to assemble clear understanding of U.S. territories such as Puerto Rico. Given recent climatic events, Puerto Rico is a vital and highly nuanced site for studying education in rural contexts, but one that seems destined to remain understudied, if not ignored. Moreover, what can we make of Mississippi? To some researchers, it is the state where rural education matters most (Showalter et al., 2019). To others, it occupies some place in an unexplained Top 5 of "rural states" (Carver et al., 2005). However, our sample shows considerable neglect for the Magnolia State, turning what might be a crucial context into a potential research desert. A related point about ranking states in terms of rurality concerns employing metrics such as population density, distance between cities, access to services, or others to rank states' degrees of rurality, which can yield two problems. First, when rankings are not tethered explicitly to metrics, readers have free reign to fill in the blanks. Second, rankings can be problematic if producers or consumers of those rankings do not immerse themselves in ongoing conversations about rural designations.

We also wish to emphasize that the certain states and regions which appeared frequently in our sample are not necessarily over-studied. Even the best-represented areas comprised disproportionately tiny fractions of the education research landscape. In this light, Illinois is a case in point as we found a relative array of studies, but no through-line among them to inform state-specific policies or practices that pertain to rural education. Such states with comparatively large amounts of research attention might offer only bits of topic-specific knowledge. A primary danger of this geographic dearth of literature is the implication that *some* rural places can approximate *all* rural places. Stereotypes that perennially rankle rural education researchers can take stronger hold if studies represent only a few places. Relatedly, the practice of referring to entire states as rural casts the 100,000-plus city dwellers each in urban centers such as Jackson, MS; Billings, MT; Fargo, ND; and Sioux Falls, SD, as if they live in rural places.

Employing unrefined descriptors can leave research consumers in a state of geographic confusion, perhaps unable to determine whether any study or group of studies might offer utility in their setting. Our analysis reveals an unclear picture of assumed, unspecified regions. Names assigned to these regions varied in our sample, overlapping between (and sometimes within) studies. Such lack of definitional clarity can yield inappropriate or inaccurate aggregations. Does the "Southwest" encompass Californian agricultural communities, the Navajo Nation, Arizona's borderlands, and Texas' sprawling cattle ranches in the same way it captures small towns near metropolitan centers such as Albuquerque, NM; El Paso, TX; or Phoenix, AZ? Seemingly, regional descriptors can illuminate and obscure. Admittedly, for some purposes, it might not matter whether any given state is labeled "Southwest" or "Mountain West."

In our large, diverse country with so many overlapping designations (official and colloquial), we might lose the ability to make comparisons and other uses of research if we lack a shared language to describe settings. Also, our team found it challenging to identify geographic distributions of what areas had been studied and not, within our sample, suggesting ways that already underserved areas might be further marginalized by overly broad regional designations. If we hope to identify geographic inequities in research distribution, we need to be able to identify the geographic gaps that might be papered over by such regional descriptors. We found a normative practice of naming places ambiguously—often adopting floating signifiers (e.g., contested senses of "regions") or broadly applying agreed-upon terms such as states. In many of these cases, the studies were truly local, but unidentifiably so due to a broad state designation.

Finally, while we predictably found greater attention in our sample to studies of learners within the K-12 span than those nearer their cradles or careers, some interesting gaps emerged in the U.S. rural education literature. Understandably, there are myriad challenges to conducting research with younger participants ranging from ethical considerations to participants' verbal abilities, but more pre-K rural research seems warranted. Other areas seeming to need attention, at least according to our sample, include studies that involve parents of students engaged in rural education. Further rural exploration of sectors and types of participants could facilitate synergies between a data set such as ours and recent calls for a national rural research agenda (see National Rural Education Association, 2016), which, informed by an overview of (and gaps from) a systematic sample of what the field has already studied would prove most generative.

Limitations

Please consider seven limitations when digesting these findings and their implications. We frame these limitations both regarding what our sampling process might have missed and what we have yet to extract from our data set. First, our sample does not comprehensively account for all U.S. rural education studies ever conducted and disseminated. Instead, we systematically developed a

data set that represents what many interested parties would likely find within search engines and digital databases. It seems unlikely that practitioners, policymakers, or even many early, mid-career, and senior scholars, depend upon the traditional (and perhaps somewhat passé) approach of reading any one journal's latest issue cover to cover. Much more likely, they employ search engines and databases to explore topics of interest. The convenience sampling that algorithms can provide seems to govern contemporary literature searches.

Second, our use of "school*" as an inclusion criterion for abstracts might have depressed our tertiary-sector findings; higher education studies might use words other than school and its variants to describe their sites. Third, our reliance on the "peer-review" check-box option in ProQuest Social Science Premium Collection *screened in* reports from reputable organizations such as the American Council on Rural Special Education and the National Rural Health Association. However, the peer-review process for those organizations is likely distinct from that of traditional journals, so there may be some contamination in our data, although reports from such organizations represented a trivial proportion of our large data set.

Fourth, in our attempt to parse studies' descriptions and whether/how authors could defend comparative claims, and how to vet transferability or generalizability, we waded inadvertently into formalizing assessments of study quality, exceeding the current study's scope. Such questions remain important for the field (Arnold et al., 2005) because we can often understand rural places best by comparing them to other rural places or places that we can definitively claim as non-rural (Biddle et al., 2019; Coladarci, 2007). Thus, we will continue to mine these data to explore comparisons of rural and non-rural places.

Fifth, an essential future element of our program of research involves methodological questions, which have proved much harder to answer given the wide variety we found in what authors tended to include in their methods or research design sections. What one author might call a design, another author might consider a method or analytical tactic within a design or method. Such variations seemed—at least in our sample—to depend upon authors' training or epistemological backgrounds, and perhaps also norms of the journals in which they published. Consequently, we intend, in future forays into our data set, to use a revised coding schema that can untangle methodological distinctions, allowing description of proportions of studies that adhere to quantitative, qualitative, and mixed method traditions and that use certain designs and tactics for collecting and analyzing data. To some degree, our decision to remain agnostic to study quality (Grant & Booth, 2009) confounded understanding of these important aspects. Maintaining agnosticism became increasingly difficult as we attempted to categorize studies along methodological lines, which can garner fierce debates within and across fields of research.

Sixth, in focusing on locations, sectors, and participant roles, we recognize that there are many other demographic questions worth exploring. However, this first foray into the data did not ask those questions yet. Thus far, we coded for where, what sector, and who (emphasizing "who" only in relation to one's role within and around a school). More nuanced demographic analysis is also needed, but it was not the focus of the current study.

Seventh, we also explored temporal differences between the earliest (circa 1985) and most recent studies in our data set (circa 2017), mostly finding trivial discrepancies and likely evidence of mere random sampling variability. However, we found preliminary evidence of a rise in focus on tertiary education, at least in our sample, and with inquires collecting student-level data, across sectors, seeming to decrease in frequency. Overall, this process made us aware of a need for longitudinally focused literature reviews to prompt U.S. rural education scholars further.

Provocations for Fellow Researchers

By focusing on predominant definitions and geographies, our sample highlights what might appear to be a disjointed landscape of U.S. rural education research. Further muddling our impressions, we see value both in studies that employ federal designations in rural discourses and those that develop locally situated approaches based on thick, rich descriptions. A coherent body of scholarship can effectively follow both paths when trying to smooth contested terrain. Thus, findings from the current study can reinvigorate discussion among researchers who seem locked in perpetual debates about the importance of contextualizing rural studies. However, growing the conversational circle seems equally important. We want our findings to speak to self-identified scholars in rural education and broader groups, the latter whose colloquial rural references can likely benefit from intentionality and specificity (Biddle et al., 2019).

Importantly, less than a quarter of journals with articles in our data set carry titles that suggest a rural focus, mirroring the 19% Biddle et al. (2019) reported in a review of literature that cited Coladarci (2007). In concert, our proportions suggest that conversations in rural-focused journals might be impacting too narrow a slice of the studies concerning themselves with rurality. It seems logical to conclude that research producers who do not call the narrow field of rural education their scholarly home, or practitioners and policymakers who seek answers about rural education, might be entirely unaware of this conversation and its decades of iterations. The limited presence of rural definition in most of the studies we reviewed within non-rural-focused publications speaks loudly to the need for enlarging the

conversation about defining and describing rurality. Stated plainly, most researchers who invoke rurality, to any extent, seemed in our sample not to be regular readers (or at least citers) of rural-focused journals. Therefore, self-identified rural education scholars might choose to engage colleagues on their campuses or within their social networks, especially those whose work does not typically emphasize rurality. Perhaps prompting (and listening to) colleagues whose self-identifications do not feature a rural focus during active critiques of our distinct and overlapping reporting practices can usefully press upon assumptions about how we all bound—and fail to bound—locational decisions.

Mapping extant U.S. rural education research has revealed important aspects in our sample. For instance, few studies guided readers' knowledge of what rural settings entail or left clues to enable determinations of where most U.S. education research on rural places was taking place, confirming prior rural-relevant findings (Thier & Beach, 2019). Also, obscurity abounds regarding specific designs and tactics that scholars used to derive and analyze data from rural places somewhere in the United States, aligning with prior urban education research (Anderson & Stillman, 2013). We encountered a murky picture, compelling us to remind ourselves and others: The more information readers have about any given somewhere, the more useful that research will be (Dynarski & Kisker, 2014). Accordingly, we followed the mapping review convention (Grant & Booth, 2009) of probing questions such as:

1. What are the best next steps to vet utilities gained and lost from endorsing a single schema to define and report findings from consensus-agreed rural places?

2. Given that studies can permeate boundaries, what do researchers sacrifice by using unexamined regional descriptors rather than naming states where studies occurred?

3. How can we address a lack of studies in certain geographies (e.g., "regions") or sectors (e.g., pre-K) that seem under-interrogated?

4. To what extent can findings from U.S. rural education studies writ large or within certain catchment (e.g., states, well-defined regions) areas speak to one another?

Last, we advocate maximal transparency and specificity but acknowledge that researchers always need to protect their participants. Still, Nespor (2000) reminds us that "[a]nonymizing a place suggests that the identities and events that happen there float, so to speak, above or outside specific historical or geographical moments" (p. 557). Anonymizing in education research can reinforce a default assumption of metro-normativity (Green & Reid, 2014). We challenge ourselves and others to balance naming places with optimizing utility for scholarship, policy, and practice, meanwhile safeguarding individual and community privacy. We also aim to spur ongoing conversation about methodological challenges that associate with researching rural places and small communities (Corbett & White, 2014). Moreover, our mapping review of the U.S. rural education research landscape can provide a useful framework for corresponding research of urban spaces, as well as rural and urban spaces in various nations. We hope that our colleagues can all peruse a bird's-eye view of research deserts, so we hope our initial map will illuminate valuable paths for anyone whose work needs to get "rural" as right as possible.

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