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ESL Participation as a Mechanism for Advancing Health Literacy in Immigrant Communities

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Abstract

A reliance on the conceptualization of *health literacy as functional skill* has limited our views of the adult English-as-a-Second-Language (ESL) context as a site for health literacy interventions. To explore the contributions of alternative views of *literacy as social practice* to health literacy research, we examined teacher survey data and learner outcomes data collected as part of a multi-year collaboration involving The California Diabetes Program (CDP), university researchers, and adult ESL teachers. The survey results (n=144 teachers) indicated that ESL teachers frequently model effective pedagogical practices that mediate social interaction around health content, the basis for acquiring new literacy skills and practices. In the classroom pilot, (n=116 learners), the majority of learners reported they had learned about diabetes risk factors and prevention strategies, which affirmed existing healthy behaviors or prompted revision of unhealthy ones. About two-thirds of the learners reported sharing preventive health content with members of out-of-school social networks. This study represents a first-step in research efforts to account more fully for the mechanisms by which social interaction and social support facilitate health literacy outcomes in ESL contexts, which should complement what we already know about the development of health literacy as functional skill.

Reducing health disparities in U.S. immigrant communities represents a complex task that will require interdisciplinary problem-solving and community partnership. Despite a growing body of evidence linking limited health literacy to poor health status, inadequate quality of care, higher rates of chronic disease and mortality, and excess health care costs (Sentell & Braun, 2012; Koskan, Friedman, & Hilfinger Messias, 2010; Berkman, Davis, & McCormack, 2010; Schillinger et al., 2002) few examples of successful collaborations between the fields of public health and adult literacy education exist (Elder et al., 2000;

Taylor et al., 2008). Even fewer investigators focus on developing new educational models that address health literacy disparities for the more than 23 million adults in the U.S. who speak English “less than very well” (Migration Policy Institute, 2007).

The adult English as a Second Language (ESL) system remains an untapped resource in the effort to address health literacy disparities among under-served immigrant populations, those with limited schooling and literacy skills, as well as other historically hard-to-reach populations, such as immigrants without legal documentation and elderly immigrants. Type 2 diabetes (DM2) disproportionately impacts populations with limited literacy skills, with adults with limited English literacy and language proficiency nearly twice as likely as those with adequate skills to have DM2 (Sudore et al., 2006). Also, given that DM2 rates rapidly increase among immigrant groups as they assimilate to life in the US (Stoddard, He, Vijayaraghavan, & Schillinger, 2010), preventing DM2 in ESL learners and their families provides a strategic public health context in which to promote collaboration between public health and adult literacy education.

The few health literacy studies conducted in ESL settings largely have reflected a *functional* view of health literacy, one that emphasizes an individual’s capacity to comprehend and utilize health information (Elder et al., 2000; Taylor et al., 2008). Such a focus on health literacy as an individually experienced set of reading/writing skills assumes an oversimplified logic wherein improvements in reading and writing lead to improved health outcomes (Rudd, Epstein, Oppenheimer, & Nath, 2007). Rarely questioned is the assumption that health literacy refers to learning to read, write, and speak *in English*, versus considering that for many adult ESL learners who are proficient in other languages, health literacy may be better characterized as an emerging “multilingual competence” (Cook, 1992), referring to the entire system of language knowledge that an ESL learner possesses (rather than only focusing only on what he can or cannot do in English). Despite the emphasis on the social context which shapes health care beliefs and decisions in health literacy definitions (Nutbeam, 2008)), health literacy educational practices have largely failed to recognize the multi-lingual, multi-cultural knowledge about health and health care systems that adults of varying literacy skills possess.

Researchers who emphasize a social view on literacy (Papen, 2009; Barton, Hamilton, & Ivanic, 2005) favor an alternative view to the functional view of health literacy, one that makes provision for health literacy as an individual’s *cognitive skill set* as well as a *social practice* (cf., (Hellermann, 2008; Purcell-Gates, 2007; Barton et al., 2005; Scribner & Cole, 1999; Heath, 1983). The ‘literacy as social practice’ view builds on the basic premise that language and literacy are inherently social outcomes. Rules of usage are shaped by social contexts and social conventions; language and literacy skills evolve only when individuals interact with others (Gee, 2012; Kramsch, 2003; Schieffelin & Ochs, 1986; Street, 1984). This ‘social’ view does not deny the importance of cognitive processes of reading and writing; rather, they are included as part of a richer, more complex picture of the ways ESL learners participate in the health care system and health promotion initiatives, at any level of English proficiency, as well as the opportunities (or struggles) to improve their participation in that system.

In our work in adult ESL classrooms, the social dimensions of health literacy are defined by (1) the learners' prior and increasing engagement in everyday literacy practices associated with health care tasks (e.g., reading nutrition labels, filling out forms); and (2) the range of pedagogical approaches (e.g., whole-group, pair-work, project-based team) used to assist learners in the development of new knowledge and practices. An exploration of these two domains demonstrates that health literacy development is not merely a matter of cognitive skill development but also of shared social practices. Our analytic focus in our broad research agenda is classroom interaction – specifically, learners' engagement with the teacher and other learners that center on meaningful health topics and that contain opportunities for learning.

To date, few studies have embraced this social view of health literacy (e.g., Hohn, 1998; Edwards, Ciliska, Halbert, & Pond, 1992; Handley, Santos, & McClelland, 2009). In an effort to further expand this empirical base, we focus on the adult ESL classroom as an under-utilized site for building a research base on health literacy as skill and social practice, and for promoting health literacy interventions at both the individual and social level. Drawing on data from a statewide ESL teacher survey, this paper lends insight into the active role that adult ESL teachers play in the development of health literacy practices among California's adult ESL learners. Drawing also on data from a subsequent classroom pilot, this paper offers an initial look at the impact of engagement with DM2 content on learners' health literacy skills and practices. Through this preliminary analysis of efforts in California to promote engagement around DM2 prevention in immigrant communities via adult ESL programs, we posit that the adult ESL system provides a rich context for (1) understanding the mechanisms by which social context facilitates the acquisition of new health literacy skills in immigrant communities; and (2) leveraging the power of social relationships and social supports that are already a part of immigrant adults' everyday lives.

Methods

This study was conducted as part of a four-year project called The ESL Diabetes Prevention Project (2008–2012), led by The California Diabetes Program (CDP), a statewide program administered by The University of California-San Francisco¹. Study procedures were approved by Institutional Review Board offices at The University of California-San Francisco and San Francisco State University.

The project involved three phases, beginning with the formation of an ESL Task Force of CDP staff, ESL teachers, and researchers from San Francisco State University and the University of California-San Francisco (Phase 1). As part of a needs analysis aimed at informing an ESL curricular intervention on DM2 prevention (Phase 2), the Task Force reviewed health literacy and DM2 prevention curricula, conducted outreach visits in 4 adult ESL classrooms to gather learner input on high-interest health topics and preferred teaching approaches, and administered an online survey of California ESL teachers. In Phase 3, the Task Force worked with 5 ESL teachers in the San Francisco Bay Area to develop lessons on nutrition, physical activity, social support, and DM2 prevention, which were then implemented by the ESL teachers in 5 adult ESL classes of varying levels. The present study

highlights findings from the teacher survey (n=144 teachers) and the classroom pilot (n=5 teachers, n=116 learners).

Online ESL teacher survey – sample, data collection and analysis

We developed a 30-item teacher survey to examine ESL teachers' motivation, readiness, and capacity to integrate DM2 prevention content into their classroom instruction. Sample demographic questions included, "Do you teach, full-time or part-time?", "How long have you been teaching in adult ESL education?", and "What percent of your adult ESL students arrived in the U.S. in the last 2 years?"

As noted earlier, if we view literacy learning as a social process, we must take into account the role of talk and exchange in the learning process. For this reason, the survey also asked questions about the teachers' instructional approach, specifically regarding how they engineer the classroom environment such that there are ample opportunities for peer-to-peer exchange, collaboration, and feedback: for example, questions about the importance and use of pair-work or project work. Teachers' perceptions of health content were assessed with 7 questions, e.g., "What excites you the most about addressing diabetes prevention content in your ESL teaching?", "Which of the following preventive health topics have you previously addressed in your ESL teaching?"

Respondents were recruited via list-servs managed by 3 well-established organizations: California Teachers of English to Speakers of Other Languages (CATESOL), a professional membership organization; the Outreach and Technical Assistance Network (OTAN), a state-supported organization which provides technical support and resources to adult educators; and CAL-PRO, which supports statewide professional development efforts. Survey data were anonymous, with a unique respondent ID number assigned to individual surveys.

To analyze the teacher survey data, we calculated descriptive statistics on teacher perceptions of health content in the ESL curriculum, the pedagogical processes used in the classroom, and perceptions on the integration of health content.

Classroom Pilot – Data collection and analysis

The classroom pilot (Phase 3) was conducted over a 4-month semester in collaboration with 5 experienced adult ESL teachers at a large, community college-based adult ESL program. The teachers were 40–50 years old, with prior experience teaching health content in their ESL classrooms. The teachers possessed graduate degrees in ESL education, with an average of 20.5 years of experience, ranging from 7 to 35. The content of the teacher's ESL lesson plans was informed by the needs analysis, pedagogical principles which emphasized giving learners opportunities to critically evaluate preventive health messages reported on previously (Santos, McClelland, & Handley, 2011; Handley et al., 2009), a review of the Diabetes Prevention Program curriculum of the CDC (Diabetes Prevention Research Group, 2002), and the teacher's evaluation of their particular learners' needs. The ESL curriculum work leading to the pilot involved discussions of health literacy as skill and social practice among the ESL Task Force members. The 5 ESL teachers drew on both perspectives to inform their lesson planning around two content areas chosen for the classroom pilot, "healthy eating" and "staying active".

As illustrated in Table 1, from the ‘skills’ domain, the teachers aimed to build learners’ knowledge relevant to DM2 prevention content (i.e. the comprehension of DM2 preventive content related to nutrition and exercise, and the assessment of that comprehension). In the ‘social’ domain, the teachers’ pedagogical goals attended to the nature of learners’ engagement with the DM2 material, including the connections between new DM2 content and learner prior knowledge, the kinds of texts (e.g., risk test) learners encounter as part of the learning process, and the possible impact in-school social interactions might have on learners’ out-of-school interactions with the DM2 material. For both domains, the teachers used a variety of classroom social arrangements (whole-class, pair-work, project-based group work, role-play, teacher-student one-on-one) to engage the learners in the DM2 content.

Data collection included 25 hours of planning discussions with the 5 teachers, learner background questionnaires, an adapted version of the American Diabetes Association (ADA) Diabetes Risk paper test form, ESL learner post-lesson evaluations, and teacher’s post-lesson evaluations. For this paper, we analyzed the learner background questionnaires (collected at the beginning of the pilot), the learners’ adapted ADA test scores (administered once, towards the end of the lesson sequence), and the learners’ post-lesson evaluations (collected at the end of the lesson pilot). The post-lesson evaluations included open-ended questions (e.g., “What do you plan to do with this health information?”); where relevant, we incorporated learner quotations drawn from these evaluations into our analysis to further highlight trends in the data.

The ESL program maintains an open-entry/open-exit enrollment policy, which means that learners are permitted to enroll in an ESL class at any time during the semester. For this reason, not all 150 learners participated for the entire duration of the pilot. We focused this study on a sub-sample of learners (n=116) who participated in the full pilot cycle, and for whom we have a complete set of data collection forms. For a sub-set of 26 learners (out of the total 116), selected because they were enrolled in the same classroom, we gathered ADA paper test forms, which were completed towards the end of the lesson module.

Teachers were offered a \$500 stipend for their participation in the development of lesson materials and participation in the pilot implementation. All 150 learners in the 5 classes were presented with a certificate of completion at the end of the semester and a small gift (school supplies) in appreciation of their participation.

To analyze the classroom pilot data, we calculated descriptive statistics on learner demographic information, as well as on their evaluation responses on the post-lesson questionnaires. We also examined the ADA risk scores with respect to learner demographic characteristics. For both the teacher survey and learner data, data analysis made use of SPSS Version 12.0 for Windows (SPSS Inc, Chicago, Ill) and Excel.

Results

Online ESL teacher survey

As noted earlier, the ESL teacher survey was conducted as part of the needs analysis phase of The ESL Diabetes Prevention Project, in an effort to gauge the willingness and readiness of adult ESL teachers in California to integrate DM2 content into their daily instruction. The survey findings informed the scope of a curricular pilot, which is discussed in the second half of the results section.

Teacher demographic profile

As summarized in Table 2, the teachers who participated in the online survey were predominantly female (86.8%), White, non-Hispanic (73.2%), and working part-time (78.0%). Thirty percent had completed formal ESL teacher training in the context of a short-term credential/certificate program, with an additional 41.5% having a Master's degree in ESL education. Approximately 23% of the teachers taught at the lowest levels of ESL instruction. An additional 23.5% worked in multi-level classrooms, in which the teacher manages a wide range of proficiency levels in a single classroom.

About a third (32.6%) of the teachers reported that 25–50% of their classroom enrollment included recently arrived immigrants (i.e., < 2 years), with an additional 15.3% reporting that 51–100% of their ESL classes are recently arrived immigrants.

The teachers (n=144) reported that Spanish was the most commonly spoken primary language (91%) in their classrooms, followed by Chinese (36%), Vietnamese (21%), Korean (19%), Russian (15%), Arabic (7%), Japanese (8%), Hmong/Thai (15%), Persian/Farsi (13%), and other languages (24%).

Social interactions as part of ESL pedagogy

The top 3 most frequently cited pedagogical practices described as “very important” included: “students working in pairs or small groups” (84.7%), “whole-class instruction: (53.0%), and “more advanced students work with less proficient students” (50.0%). Nearly half (48.8%) of the teachers indicated that “students working in groups to complete a project” was “very important”. About two-thirds (63.2%) indicated that asking “students to lead activities” was a “somewhat important” pedagogical approach.

The orientation of ESL activities to learners' everyday lives

The majority of teachers (81.5%) indicated that “integrating real-life materials” (e.g., actual health care forms) was “very important” in ESL instruction. “Using students' own experiences to design language learning activities” was considered “very important” to 63.4% of the teachers. Nearly all teachers (94.1%) listed “connecting English with real-life actions” as “very important” in their ESL instruction.

The interest, readiness, and capacity of ESL teachers to promote health literacy and address diabetes prevention in the classroom

A high proportion of teachers (89.4%) agreed that “diabetes prevention is an important topic to cover” in their ESL teaching (see Table 3). 69.0% of the teachers agreed that they “would like to collaborate with a health practitioner to develop ESL lessons”. Nearly two-thirds of the teachers (62.9%) agreed that “several ESL learners in their classroom have diabetes or pre-diabetes, or are at risk of developing diabetes”.

A high proportion of teachers in the sample (80.6%) agreed that they felt “confident” about addressing DM2 prevention as a topic in their ESL teaching. The teachers reported somewhat mixed views on their ability to access resources related to DM2 prevention content. About half agreed that they knew “where to find diabetes prevention information and resources to include in their teaching”, while a quarter of teachers (25.2%) disagreed, and 16.8% reported uncertainty (“don’t know”) about how to find such information and resources.

A majority of teachers in the sample indicated that health topics are commonly addressed in their ESL curricula: 43.7% of the teachers address health topics “often/frequently”, with 41.0% reporting “sometimes”, and only 6.9% “rarely”. A majority of the teachers reported prior experience working with health topics in their ESL teaching, with the most frequently cited themes relevant to the prevention of DM2 and other chronic disease conditions. Nearly all the teachers in the sample (93.2%) had previously addressed diet-related health topics in their teaching: “healthy eating, nutrition, food pyramid”. The next most frequently addressed health topic included “doctor’s visits” (78.8%), followed by “physical activity, exercise” (75.8%) and “emotional well-being” (50.8%). Less frequently addressed topics included “navigating the U.S. health care system” (47.0%), “medical tests/screenings” (45.5%), “tobacco use” (40.2%), “weight loss” (37.9%) and “understanding disease risk factors” (35.6%). The under-utilization of risk assessment topics may help to explain why 31.1% of the teachers (Table 3) reported not knowing whether their ESL learners had diabetes/pre-diabetes or whether they were at risk.

The teachers reported a modest ability to integrate health topics in their ESL teaching, even if curricular flexibility varies in their ESL program. Approximately 45% of the teachers with “a lot” of curricular flexibility reported “frequently” addressing health topics in their teaching. Even among teachers with less curricular flexibility, more than half (55.3%) reported being able to address health topics in their teaching.

The survey data also highlight the additional kinds of health resources that teachers would find useful in their ESL classrooms. Most frequently cited resources included “flyers and brochures” (85.9%), followed by “hosting of diabetes prevention expert presentations for students” (84.1%). In addition, the majority of teachers (80.9%) indicated the need for “development of ESL curriculum on diabetes prevention”, whereas 77.9% requested “training...about diabetes prevention as ESL content”. Given the somewhat mixed data about the extent to which teachers knew whether their learners were at risk for diabetes (Table 3), it is notable that 75.4% of the teachers requested assistance with bringing “on-site diabetes screenings” to their ESL programs. Although the majority of these teachers work part-time,

over half (57.3%) were interested in investing time in “grant-writing to expand diabetes prevention efforts” in their ESL programs.

About three-quarters of the teachers (78.6%) agreed that “it would be valuable for students with diabetes experiences to act as ‘coaches’ for other students at risk for developing diabetes”, which reflects the teachers’ attention to peer pedagogical practices that might support the exchange of information about DM2 prevention context.

Classroom pilot

Learner demographic profile

The full learner sample (n=116) is described in Table 4. Females comprised 67.5% of the learner sample. The average age was 40, ranging from 19 to 83. About half (54.3%) were Asian; 37.9% were Hispanic. Among the learners, 42.1% had less than a high school education, 30.7% completed high school, and 27.2% completed some form of post-secondary schooling.

The largest primary-language group was Chinese speakers (40.9%) from China. The second largest group were Spanish speakers (38.3%) from several Spanish-speaking countries, such as Guatemala, El Salvador, and Mexico. The next largest group spoke Vietnamese (8 learners, 7%).

About two-thirds of the learner sample (61.8%) had lived in the U.S. for 4 years or less. On average, the learners reported having studied English for 2.39 years (s.d.=2.93). Among the learners, 60.2% were married; 43.5% were employed. Of the 69 learners with children, 17.2% had children under age 8.

Learner baseline health profiles

Among the learners who provided health status information (n=102), 46.1% reported “good” to “very good” health at baseline; about a third (36.3%) described their health status as “okay” or “fair”, and 16.7% indicated that they “didn’t know”; only 1 student reported “bad” health. Nearly half of learners (41.8%) reported having no health insurance. About half (47.5%) reported having no “access to a regular doctor”.

Eleven learners in a sample of 100 (11.0%) reported having been “told by a doctor that s/he has diabetes”. Among the female learners in the sample, 7.0% had been “told she had gestational diabetes”. Nearly half of the learners (46.0%) reported having “family and friends with diabetes.”

Impact of ESL lessons on learners’ health literacy skills and social practices

Knowledge of DM2

Among the 70 learners for whom we had post-lesson evaluation data, nearly all of them (95.7%) indicated that “diabetes is preventable”. This comment from an Asian learner in her mid-30s is illustrative of the learners’ evaluations: “I’m glad to learn about diabetes. I knew

one name of illness [*sic*] but I didn't know the truths of diabetes. I thought diabetes was scary illness [*sic*] before. Of course that is true. But We can prevent it. We must to change life style." Learners (n=70) also demonstrated knowledge of several key strategies for preventing DM2, which reflect messages promoted by the California Diabetes Program, including: "Make healthy food choices" (84.9%), "Be physically active" (82.2%), "See a doctor" (24.7%), "If you are overweight, lose 5–7% body weight" (20.6%), and "Check your blood sugar" (15.1%). Only 2 learners listed "Get support from family and friends" as a key strategy.

Preventive health behaviors

At the end of the classroom pilot, 44.8% of the learners indicated they had plans to change eating habits; 50% indicated they had plans to change exercise habits. Among 30 learners who had plans to change their eating habits, 28 reported feeling "confident" to "very confident" they would make changes. Similarly, among 22 learners with plans to change their exercise habits, 18 reported feeling "confident" to "very confident" they would make changes. Many learners indicated they already had healthy nutrition and exercise habits at baseline, suggesting the ESL lessons reinforced healthy habits in addition to supplanting less healthy ones. For 16 learners in one class, 9 of the learners said they would maintain active exercise levels, while 5 learners indicated an increase from 3–4 times a week to 5–7 times a week.

Learner knowledge of own DM2 risk

For 26 of the 116 learners, we were able to gather their scores on the ADA Diabetes Risk Test, administered one time towards the end of the classroom lessons. Among these learners, 20 scored as being at "low risk", and 6 as "high risk". Of the 6 learners in the "high risk" category, 3 learners reported their health status was "okay" at baseline, and 1 learner reported "very good" (2=missing). Three of the "high risk" learners did not have health insurance, 1 had health insurance, and for 2, health insurance data were missing).

At the end of the classroom pilot, all 26 learners who took the Risk Test, regardless of risk level, indicated that "diabetes is preventable" and were able to list key prevention strategies. All 26 learners indicated the lessons had given them ideas for preventing DM2 that they would share with others.

Impact on social practices

The majority of the total learner sample (89.0%, n=116) reported that the lessons gave them ideas to help themselves and their families prevent DM2. About two-thirds of the learners (63.6%) reported having shared health information from the class with others (other classmates, spouses, elderly parents, children, friends, co-workers). The following comments are illustrative of the learners' intentions to share:

- "I like the information about the prevention of this disease because everybody can have care (*sic*) to not get sick. I understand now more about the Diabetes and talked with my wife for (*sic*) eat more healthy. Now we have more exercises. (*sic*)" (53-year old male, from Mexico)

- “My mother had a diabetes, and she was seventy years old. I always reminded her to eat healthy food and doing exercise. I learn more diabetes information from website www.diabetes.org.” (female, age unknown, from China)
- “I’ll tell my children do exercise, and eat health food can prevent diabetes” (39-year old mother of 3 adolescents, from China)
- “I have to change my family’s eating habits and exercise habits to prevent diabetes” (34-year old mother of 4-year old, from China)

This anecdotal evidence hints at ways that the social practices of preventive health knowledge sharing and diffusion – which occurred initially in the classroom – often can extend to contexts outside of school, in the home and community.

Discussion

In line with the work of (Rudd, 2002), (Coronado et al., 2008), and (Diehl, 2011), our findings demonstrate that adult literacy practitioners are strategic intermediaries in the world of immigrant health care, a social support phenomenon that reflects views on “literacy sponsorship” in literacy research (Comings & Cuban, 2002; Brandt, 1998). The majority of the teacher survey sample signaled that preventive health outreach is an important area for curricular expansion in adult ESL programs. Many ESL teachers demonstrated motivation and high interest in reaching out to public health professionals and organizations to diversify classroom resources, from printed communication to in-person interactions with public health professionals. Also notable is the teachers’ interest in partnership with health organizations to pursue funding in support of these kinds of health literacy activities. This appeal for collaboration takes on greater urgency when we consider the chronic lack of resources in the adult ESL system, one whose funding formulas have remained at 1970s levels, despite continued growth in enrollments across the U.S (Gonzalez, 2007).

The teacher survey data also reveal that, without the appropriate investment of time and resources in partnership development, teacher training, and curriculum development, ESL teachers may be limited in their capacity to be strategic partners. The mixed results regarding teachers’ ability to locate reliable DM2 resources points to the need for improving access to curricular resources to ESL practitioners; without such access, teachers may be quite limited in their ability to integrate preventive health care topics into the adult ESL curriculum (and thereby limiting impact on learners’ functional health literacy skills). In this regard, significant demands are placed on the adult ESL teacher who must navigate the dense health information environment in print and on the Web. Thus, the success of ESL-based health literacy interventions may rest, in part, on *the health literacy skills of adult ESL teachers themselves* and the packaging of appropriate health literacy curricular content for their instructional needs. The “literacy as social practice” approach endorsed in this paper underscores the powerful and active role that adult ESL teachers can play in the development of new health literacy skills in immigrant communities, and the need to examine ways teachers are ready to engage their learners with preventive health content but may be limited in their capacity to do so. Although the ESL learners would be the primary target of health literacy interventions, from a social view, the impact of an ESL-based

intervention might best be understood at the collective level, in other words, that the achievement of health literacy gains is shared by both the ESL teacher and her learners (Nutbeam, 2000; Papen, 2005, 2009). Future research should more closely examine the mechanisms by which the ESL teacher-student relationships facilitates health literacy development.

The classroom pilot data revealed positive impact of the ESL instruction on learners' functional health literacy skills: the majority of the 116 learners, despite varying proficiency levels, were able to acquire knowledge of DM2 risks and prevention strategies, and apply this knowledge to the affirmation of healthy everyday behaviors, or the planned revision of unhealthy ones. In addition, the classroom pilot data provided some insight into the promise of a social view in health literacy intervention studies, one that does not reject the importance of cognitive skills but situates them in a broader, multi-layered, and perhaps more accurate understanding of the way adults actually go about learning to be more 'literate' in our society and our health care system. Specifically, the pilot data suggests that social interaction is an important dimension of ESL learner health literacy gains, as evidenced in the attention the 5 ESL teachers gave to the classroom social arrangements which facilitated and mediated their learning of new language skills (vocabulary, grammar) as well as the DM2 content. The teacher survey data highlighted how teachers support learner-to-learner interaction around complex health content, even when learners' English oral communication skills may be quite minimal. Pedagogical practices that involve the engagement and support of others (peer-to-peer, more advanced with less advanced) seem to be commonly used in adult ESL classroom, which, from a social practices view, reinforces the need for social interaction in the learning of new skills. In fact, the ESL classroom may represent the most accessible and significant social context for immigrant adults to strengthen their interactional competence and build self-confidence about speaking in English about their health promoting experiences in the U.S. (Santos, McClelland, & Handley, 2011).

The data around learner transmission of information to others speaks to the importance of increased social influence as a legitimate health literacy outcome. It is unclear whether the rather global nature of the learners' health messages – "I'll tell my family to eat healthy" or "do more exercise" --- will yield actual changes in preventive health behaviors in out-of-school social networks. In a study of the development of functional health literacy among native-English speaking adult literacy learners, Freedman, et al (2011) similarly affirmed the value of learner-driven messaging, but also concluded that "it is important to find ways to maximize potential reach while simultaneously ensuring accuracy of shared knowledge" (p. 130). From a functional view on health literacy, the potential value of learner-driven communication channels is reflected in improved individual comprehension and transmission of factual health content (see Nutbeam, 2008). However, the social practices view on health literacy argues that the accuracy of the learners' messaging is only one way to gauge literacy gains. The value of these learner-driven communication channels lies also in what they can reveal about the shifts in cultural value assigned to these messages, which messages they are motivated to disseminate, and whom they are motivated to tell. Because ESL learners are cross-connected with members of other social networks, the social practices view on health literacy interventions anticipates that, by improving the way

learners participate in classroom discussions about health, the learners may also improve their participation practices in other contexts (at home, workplace, doctor's office).

How can a social practices view enable us to imagine accelerations in health literacy gains, beyond what functionally informed interventions may offer alone? Our pedagogical focus on social interaction as a key driver of health literacy development is consistent with *practice-engagement theory* (Reder, 1994, 2009) which “posits that literacy proficiency develops across the lifespan as individuals engage in literacy practices.... Reciprocally, higher levels of literacy proficiency lead to increased engagement in literacy practices” (Reder, in press). As adult ESL learners increase their engagement with new health literacy practices, initially in the classroom, and then eventually in out-of-school contexts (e.g., home, health care settings), they expand their access to institutional, social, and material resources. Through meaningful interactions with others (e.g., teachers, more expert peers), ESL learners in turn may adopt new literacy practices for managing preventive health care tasks that they otherwise would not have been able to do alone. Reder's (2009) longitudinal research on English-proficient adult learners found that the impact of increased practice-engagement on literacy proficiency was significant, but the effects were not immediate: Reder found it took 5–6 years to see the positive impact of practice-engagement on proficiency.

The practice-engagement model holds powerful implications for future research and theory-building in the health literacy field. First, we need to examine applications of *practice-engagement theory* to our understandings of health literacy development and preventive health behavior change. Second, we need to consider methodological gaps, such as the need for instruments that measure engagement in health literacy practices (beyond self-report); skills-oriented tests, such as the REALM or TOHFLA, are not designed to tap into changes in practice, which, as Reder (2009) suggests, may manifest before changes in reading skills. We also need to invest in multi-year collaborations and longitudinal research designs that can capture the relationship between changes in practices and health literacy outcomes, which appear to be accumulative and gradual.

Study limitations

This study has several limitations. The teacher survey represents a relatively small proportion of California's ESL workforce, so no generalizations are made to the larger population of ESL teachers. Similarly, since teacher participation in the pilot was voluntary, we likely recruited a subset of ESL teachers with high levels of motivation to introduce health curriculum into their classrooms. The classroom pilot was conducted in ESL classrooms with diverse proficiency levels, making it difficult to determine if our measures captured variation in engagement with DM2 content. Thus, our findings may not be representative of each learner's experience. Relatedly, our learner outcomes were oriented more towards acquisition of health literacy skills, rather than behavioral outcomes germane to DM2 prevention. Health literacy changes were only measured through self-report, so we cannot derive firm inferences about actual learner gains in health literacy. We were not able to triangulate the self-report teacher survey data with direct observations of classrooms. Similarly, we were not able to triangulate learner post-evaluation data with direct

observations of changes in behavior, nor complement our view of the learners' skills with direct assessment of health literacy skills or gains in English proficiency.

Conclusion

To date, little research has applied theoretical advancements regarding literacy as a social practice to the study of health literacy in the adult ESL context, and to the development of educational interventions. In this regard, the adult ESL setting can advance ESL learners' health literacy in both traditional functional dimensions as well as social practice dimensions. This study, which focused on DM2 prevention because of the unique salience of the epidemic to the immigrant population in California, provides preliminary evidence that the adult ESL profession can be a strategic partner in efforts to promote health literacy outcomes in immigrant communities.

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Table 1

Health literacy as skill and practice: Influences on the ESL curriculum

ESL Classroom Content	Focus on health literacy as skill	Focus on health literacy as practice
Learning about DM2 Risk Factors	<ul style="list-style-type: none"> Vocabulary: risk, at risk, pre-diabetes, body parts Identify symptoms of DM2 Identify risk factors Identify key DM2 preventive strategies 	<ul style="list-style-type: none"> Role-play interactions with doctors, family, and friends about DM2 risk Share personal views about risk, in cross-cultural exchange (Group work, Identifying sources of 'reliable' health information: Friends? Doctors? Internet?
Taking the ADA Risk Self-Assessment	<ul style="list-style-type: none"> Calculate body weight, height Read height and weight charts Calculate and interpret risk scores 	<ul style="list-style-type: none"> How to talk about risk with peers, family members – who wants to get screened, who doesn't, and why Learn to ask questions about what risk scores means Learn to ask for support and resources
Healthy eating, nutrition	<ul style="list-style-type: none"> Understand the "Healthy Plate" graphic Read nutrition labels Vocabulary: carbohydrate, protein, grain 	<ul style="list-style-type: none"> Share ideas of what it means to be "healthy" Talk about the applications and limitations of "Healthy Plate" in real-life Tell stories of food memories in home country, versus food habits in the U.S.
Getting physically active	<ul style="list-style-type: none"> Understand effects of exercise on body Identify different intensity levels Identify different types of exercise 	<ul style="list-style-type: none"> Identify common barriers to exercise Discuss what kinds of exercise routines are realistic – what you can do alone, what you can do with others

Note. For sample lesson materials, contact first author.

Table 2

Demographic Summary of Teacher Survey Participants (n=144)

Characteristic	# (%)
Gender (n=129)	
Female	112 (86.8%)
Male	17 (13.2%)
Race^d (n=127)	
White, non-Hispanic	93 (73.2%)
Hispanic	15 (11.8%)
Asian	5 (3.9%)
Bi-racial, multi-ethnic, other	14 (11.0%)
ESL teaching experience (years) (n=126)	
Less than 5 years	26 (20.6%)
6–10 years	30 (23.8%)
11–20 years	36 (28.6%)
20+ years	34 (27.0%)
Formal ESL teacher training (n=130)	
Master's in ESL pedagogy	54 (41.5%)
Credential/certificate in ESL	39 (30.0%)
On the job training	15 (11.5%)
No formal training	12 (9.2%)
Other	10 (7.8%)
Employment status (n=127)	
Full-time	28 (22.0%)
Part-time	99 (78.0%)
Agency that funds ESL program (n=143)	
Unified school district	58 (40.5%)
Community college	54 (37.8%)
Community-based, non-profit	15 (10.5%)
Other	16 (11.2%)
Region of ESL program (n=143)	
Urban	82 (57.3%)
Suburban	52 (36.4%)
Rural or mixed	9 (6.3%)
Average size of ESL class (n=124)	
< 20 students	36 (29.0%)
21–30 students	65 (52.4%)
> 30 students	23 (18.6%)
ESL level typically taught^b (n=136)	
Beginning/literacy	32 (23.5%)
Intermediate-Advanced	33 (24.3%)
Multi-level single classroom	32 (23.5%)

Characteristic	# (%)
Multiple levels, across classrooms	39 (28.7%)
% of recently arrived ESL learners in ESL program^c (n=143)	
Less than 25%	49 (34.0%)
Approximately 25–50%	47 (32.6%)
51%–100%	22 (15.3%)
Don't know	25 (17.4%)

Note. Frequency counts and percentages reflect number responding as a percent of those who responded.

^aNo respondents indicated Black, non-Hispanic.

^bBeginning and literacy levels categorized together, since only 2.1% of the sample reported teaching at the literacy level.

^c“Recently arrived” = Length of residence in U.S. 2 years or less

Table 3

Teacher perceptions of diabetes prevention as ESL instructional content

Statement	Agree	Disagree	Don't know
1. Diabetes prevention is an important topic to cover in my ESL teaching. (n=132)	118 (89.4%)	8 (6.1%)	6 (4.5%)
2. Several ESL students in my class have diabetes or pre- diabetes or are at risk for developing diabetes. (n=132)	83 (62.9%)	8 (6.1%)	41 (31.1%)
3. I know where to find diabetes prevention information and resources to include in my ESL teaching. (n=131)	76 (58.0%)	33 (25.2%)	22 (16.8%)
4. I feel confident that I could address diabetes prevention as a topic in my ESL teaching. (n=129)	104 (80.6%)	18 (14.0%)	7 (5.4%)
5. I would like to collaborate with a health practitioner to develop diabetes prevention-- focused ESL lessons. (n=129)	89 (69.0%)	23 (17.8%)	17 (13.2%)
6. I think it would valuable for students with diabetes experience to act as 'coaches' for other students at risk for developing diabetes. (n=131)	103 (78.6%)	17 (13.0%)	11 (8.4%)

Note. Cell counts reflect the frequency/percentage of respondents who either agreed/strongly agreed with statement.

Table 4Profile of Adult ESL Learner Participants in Fall 2011 Pilot Study (n=116)^a

Characteristic	Frequency (%)
Gender	
Female	77 (67.5%)
Male	37 (32.5%)
Age $M = 40.0$ ($s.d. = 16.0$)	
16–24	24 (21.2%)
25–44	49 (43.4%)
45–59	27 (23.9%)
60+	13 (11.5%)
Primary Language	
Chinese	47 (40.9%)
Korean	1 (0.9%)
Spanish	44 (38.3%)
Vietnamese	8 (7.0%)
Russian	5 (4.4%)
Other	10 (8.7%)
Race	
White, non-Hispanic	6 (5.2%)
Black, non-Hispanic	1 (0.9%)
Asian	63 (54.3%)
Hispanic	44 (37.9%)
Other	2 (1.7%)
Schooling history	
Less than high school	48 (42.1%)
High school graduate	35 (30.7%)
Some college+	31 (27.2%)
Years of residence $M = 5.32$ ($s.d. = 7.20$)	
<1 year	21 (18.3%)
1–4 years	50 (43.5%)
5–10 years	27 (23.5%)
10+ years	17 (14.8%)
Years studying English $M = 2.39$ ($s.d. = 2.93$)	
<1 year	41 (36.9%)
1–4 years	50 (45.1%)
5+ years	20 (18.0%)
Married	
Married	68 (60.2%)
Not married	45 (39.8%)
Working	
Employed	50 (43.5%)

Characteristic	Frequency (%)
Not employed	65 (56.5%)
Have children	
<8 years old	20 (17.2%)
>8 years old	49 (42.2%)
Health Status	
Good	47 (46.1%)
Okay	37 (36.3%)
Bad	1 (1.0%)
Don't Know	17 (16.7%)
Insurance	
Yes	57 (58.2%)
No	41 (41.8%)
Access to regular doctor	
Yes	52 (52.5%)
No	47 (47.5%)
Taking medications on a regular basis	
Yes	15 (14.9%)
No	86 (85.2%)
Been told by doctor that s/he has diabetes	
Yes	11 (11.0%)
No	89 (89.0%)
Been told by doctor that she has gestational diabetes	
Yes	5 (7.0%)
No	66 (93.0%)
Has family/friends with diabetes	
Yes	46 (46.0%)
No	54 (54.0%)