

Micki M. Caskey, Ph.D., Editor
Portland State University
Portland, Oregon

2010 • Volume 33 • Number 8

ISSN 1940-4476

Impact of Literacy Influences and Perceived Reading Ability on Self-Rated Health of Public Middle School Students

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Abstract

This study investigated the impact of literacy influences and perceived reading ability on the self-rated health (SRH) of 244 middle school students. Five literacy influences and reading ability independent variables resulted in moderate to substantial test-retest reliability [Kappas 46.6 to 63.8] over a two-week period. SRH served as the dependent variable. Students were significantly more likely to report poorer SRH (effect sizes ranged from .26 to .78) if they reported difficulty reading the survey, did not like reading, did not or were not sure if they saw a parent or caregiver reading during the past two days, or had not visited a public library or bookstore during the past year ($p < .05$), even after adjustment for socioeconomic status. Preliminary results help to quantify how early in life literacy influences and perceived reading ability may be associated with SRH.

Introduction

Policymakers and researchers have yet to assess whether students' perceived reading abilities and literacy influences impact the health status of children and youth or vice versa. Some studies have proposed that education levels are equivalent to good health (Backlund, Sorlie, & Johnson, 1999; Grosse & Auffrey, 1989; Weiss, Hart, McGee, & D'Estelle, 1992; Weiss, Hart, & Pust, 1991). Baker, Parker, Williams, Clark, and Nurss (1997) posited that educational attainment, not the years of school completed, is the most accurate predictor of health status. In their analysis, functional literacy remained an important predictor of self-reported health even after adjusting for age, gender, race, and socioeconomic status. Thus, the current study posits that literacy influences and perceived reading ability could provide a proxy for educational attainment and also be related to self-rated health status.

The relationship between self-rated health and self-reported health symptoms has been well documented among adults. For example, when asked “Would you say your health is excellent, very good, good, fair, or poor?” (or a variation thereof), a significant association has been established with life expectancy and mortality (Benamins, Hummer, Eberstein, & Nam, 2004; Idler, Kasi, & Lemke, 1990; Kaplan & Camacho, 1983; Mossey & Shapiro, 1982) and with risk behaviors such as smoking, exercise, sleep, weight, and alcohol consumption in adults (Segovia, Bartlett, & Edwards, 1989). Moreover, after reviewing 27 studies that examined self-rated health and mortality, Idler and Benyamini (1997) concluded that self-rated health status was a more powerful predictor of morbidity and mortality than other objective, physician-assessed, health indicators, making it an “irreplaceable dimension of health status” (p. 34).

The ability of self-rated health status to predict morbidity and mortality rates has been attributed to an adult’s ability to rate his or her dynamic and static health (Ballis, Segall, & Chipperfield, 2003). As Boardman (2006) indicated, self-rated health can be understood as a *dynamic assessment* of overall health when it is intimately related to current health status. In this case, an individual may take levels of energy or pain associated with actual changes in health status into account when rating his or her health. Conversely, in a *static assessment*, these fluctuations in objective health over time may not have any measurable impact on self-ratings of overall health. Thus, a *dynamic assessment* of self-rated health is tied primarily to current health status, whereas a *static assessment* of self-rated health is understood to be more related to an enduring self-concept.

To explore this hypothesis, Boardman (2006) advanced earlier work conducted among adults (Ballis et al., 2003) to investigate whether adolescent self-rated health was more dynamic or static over time. Using the Add Health data of more than 13,000 adolescents aged 11 to 18 years, Boardman found self-rated overall health status and physical health status to operate predictably over time, “suggesting that health-related survey assessments administered to adolescents are valid assessments of health, broadly speaking” (p. 406). However, some caution was extended by Boardman in interpreting the findings, because adolescents may rely more on a static assessment, although they will use both dynamic and static self-rated health assessments. Reasons for this conclusion may be due to concrete thinking tendencies among youth, who are generally less able to make

reflective past and projective future cognitions. Instead, youth are often focused on the here and now.

Because adolescents have a low prevalence of chronic health problems, physician-assessed, objective mortality assessments may not be the most appropriate measure of health status for youth. Irwin, Burg, and Cart (2002) suggested that the relationship between self-rated health status and subsequent health problems among adolescents has been explored infrequently because adolescents are generally regarded as healthy. However, there is developing evidence that similar relationships can be observed for adolescent self-rated health, like that which is observed for adult self-rated health. For example, self-rated health in adolescence is associated with personal, socio-environmental, behavioral, and psychological factors (e.g., health problems, disability, age, female status, income, smoking, and higher BMI) (Vingilis, Wade, & Adlaf, 1998; Vingilis, Wade, & Seeley, 2002; Wade, Prevalin, & Vingilis, 2000). Carvallo and colleagues (2006) suggested that these relationships may be especially evident among adolescent girls. In addition, adolescent poor self-rated health has been associated with reduced life satisfaction (Zullig, Valois, Huebner, & Drane, 2005) and with increased alcohol and substance use (Zullig, Valois, Huebner, & Drane, 2004). In sum, increasing evidence suggests a relatively robust relationship between self-rated health and a variety of health-compromising conditions among adolescents. However, literacy influences and, in particular, one’s beliefs of those influences, may also be related to perceived health status.

Reasons for exploring perceived reading abilities and literacy influences are derived from the established relationship between one’s beliefs and competencies. For example, one’s beliefs (i.e., perceived reading ability and literacy influences), whether they are accurate or not, influence one’s actual ability and actions (Maddux & Gosselin, 2003). One’s beliefs, or academic self-efficacy, can be general and pertain to one believing he or she possesses the skills and capabilities to succeed in school, or highly contextual, in that they can be focused on certain academic tasks (i.e., reading) or activities (Schunk & Pajares, 2005). More significantly, these beliefs are thought to impact students’ lives in a variety of ways but ultimately influence the level of achievement students realize (Pajares, 2009).

The purpose of this study was to investigate the impact of literacy influences and perceived reading

ability on the self-rated health status of seventh and eighth grade public school students. The research question was: To what extent can literacy influences and perceived reading ability impact the self-rated health status of seventh and eighth graders? Two hypotheses guided the study. The first hypothesis was that inadequate positive literacy influences (e.g., parental influence, visits to a library or bookstore) would negatively affect students’ self-rated health status. The second hypothesis was that low perceived reading ability would also negatively affect students’ self-rated health status.

Method

Participants

During the spring of 2005, a convenience sample of 244 middle school students in grades 7 and 8 were selected from two public school districts to participate in one part of a larger study investigating the test-retest reliability of the 2005 Middle School Youth Risk Behavior Survey (MSYRBS) from the Centers for Disease Control and Prevention (Zullig, Pun, Patton, & Ubbes, 2006). Schools were selected to participate in the study based on previous work in curriculum deliberation and program evaluation. Each school was given \$250 to assist with student recruitment. Classroom-level sampling was done with second period classes to maximize student eligibility.

Sample demographics were similar to national distributions in gender and age, as shown in Table 1, but not for race or ethnicity or grade, per the 2001 U.S. Census Bureau. Specifically, seventh grade students reporting “white” race/ethnicity were overrepresented.

Data Collection Procedures

All data collection procedures were approved by Miami University’s Human Subjects Review Board. Following methods from previous test-retest reliability studies (Brener, Collins, Kann, Warren, & Williams, 1995; Brener et al., 2002; Popham, 1993), two questionnaire scantrons were coded with the same unique number ranging from 1 to 250. Each pair of identically numbered scantrons were then placed into a single large envelope along with the MSYRBS instrument and distributed to each student participant during Time 1. Each student then removed and used one scantron. The envelope containing only the second identically numbered scantron was then sealed and signed by the student across the seal. When survey administrators returned for Time 2 (14 days later), students received their signed and sealed envelope, removed the second scantron, and destroyed the envelope.

Table 1
Demographics of Students in Grades 7–8 in the Sample and National Distribution

Characteristic	Sample Distribution (%)	National Distribution (%)
Gender		
Male	45.3	51.2%
Female	54.7	48.8%
Grade		
7	80.9	50.3%
8	19.1	49.7%
Race		
White	93.5	76.7%
Other	6.5	23.3%
Age		
<11	1.7	3.1%
12 to 13	90.9	80.9%
>14	7.4	16.0%

Parent-notification forms were distributed at least seven days in advance of survey administration. Parents who wanted their children to participate were required to sign and return the form, designating active consent to participate. The survey was administered in each school’s auditorium or cafeteria by trained data collectors, who emphasized anonymity, privacy, and confidentiality. During Time 1, data collectors reminded students that they would be returning to the school in two weeks to ask students to complete a similar questionnaire.

Design

The MSYRBS is a self-report instrument. Four items request demographic information, two items request height and weight, and the remaining items query students on health risk behaviors. For this study, five additional items, conceived by the authors, serving as the independent variables, were appended to the end of the questionnaire. Those items were written as follows: (1) How would you rate your ability to read this health survey? (2) How often do you find yourself reading books, newspapers, magazines, and other reading materials outside of school (do not include school work.)? (3) How do you feel about your ability to read? (4) How often did you see your parent or caregiver reading something in the past two days? and, (5) Have you been to the public library or a bookstore in the last year?

The response options, frequency counts, and kappa test-retest reliability coefficients for each variable are

shown in Table 2. A kappa statistic provides a measure of agreement that corrects for what would be expected by chance. Landis and Kochs (1977) have identified Kappa values of $\geq 61\%$ as having “substantial” reliability and Kappa values of $\geq 41\%$ as having “moderate” reliability. Study variables were collapsed into “risk” and “at-risk” categories based on their responses. For instance, students who reported having been to the public library or a bookstore in the last year were coded as “no risk.” Students who reported not having/not sure if they had been to the public library or a bookstore in the last year were collapsed and coded as “at risk.” All five literacy items displayed at least moderate reliability, and two items displayed substantial reliability (see Table 2).

The dependent variable for this study was self-rated health. The Kappa test-retest reliability coefficient for self-rated health was 61.8 and is detailed elsewhere (Zullig et al., 2006). Self-rated health was chosen as the dependent variable because an extensive body of literature exists in regard to self-perceived, rated, or

assessed health and its robust relation to morbidity and mortality. In this study, self-rated health status was measured with the following question: “In general, how would you describe your health?” Response options were “excellent,” “very good,” “good,” “fair,” and “poor.” The response options were coded as (1) excellent, (2), very good, (3), good, (4) fair, and (5) poor for this study such that higher scores indicated reduced self-rated health.

Procedure

In this study, only Time 1 survey administrations from each of the participating schools were combined for analysis. Of the 402 students selected to participate in this study, 249 (62%) completed the questionnaire during the first survey administration. Of these 249 students, 98% ($n = 244$) provided complete information on all items.

Owing to the varied response options within each literacy question, some collapsing of the data was necessary. For example, the response options for question one, “How would you rate your ability to

Table 2
Literacy Items, Sample Responses, and Kappa Reliability Coefficients

Survey Items: Literacy Influences (Questions 2, 4, 5) and Perceived Reading Ability (Questions 1 & 3)	Sample Response <i>n</i> (%)	Students Reporting Fair or Poor Health <i>n</i> (%)	Item Kappa
1. How would you rate your ability to read this health survey?			46.6
It was easy for me to read.	218 (89.3)	12 (5.5)	
I had some difficulty reading.	26 (10.7)	8 (30.8)	
2. How often do you find yourself reading books, newspapers, magazines, and other reading materials outside of school?			51.5
Most of the time/always	91 (37.3)	6 (6.6)	
Sometimes	96 (39.3)	7 (7.3)	
Never/rarely	57 (23.4)	8 (14.0)	
3. How do you feel about your ability to read?			67.9
I love/like to read	147 (60.2)	9 (6.1)	
I will read if I am asked	54 (22.1)	6 (11.1)	
I do not like to read	25 (10.2)	5 (20.0)	
I have trouble reading/not sure	18 (7.4)	1 (5.5)	
4. How often did you see your parent or caregiver reading something in the past two days?			53.0
Every day	130 (53.3)	4 (3.0)	
1 day	41 (16.8)	1 (2.4)	
0 days/not sure	73 (29.9)	10 (13.4)	
5. Have you been to the public library or a bookstore in the last year?			63.8
Yes	195 (79.9)	12 (6.1)	
No/not sure	49 (20.1)	9 (18.4)	

read this health survey?” were collapsed into two categories: “It was easy to read” (referent) and “I had some difficulty reading.” For the difficulty reading group, “It was hard to read,” “I found it hard to read some of the sentences,” “I was confused by some of the questions,” and “Not sure” were combined.

Response options for question two, “How often do you find yourself reading books, newspapers, magazines, and other reading materials outside of school?” were collapsed into three groups: “most of the time or always” (referent), “sometimes,” and “never or rarely.” For question three, “How do you feel about your ability to read?” response options were collapsed into four categories: “I love or like to read” (referent), “I will read when asked,” “I do not like reading,” and “I have trouble reading or not sure.” For question four, “How often did you see your parent or caregiver reading something in the past two days?” response options were divided into three groups: “every day” (referent), “1 day,” and “0 days or not sure.” Finally, for question five, “Have you been to the public library or a bookstore in the last year?” response options were collapsed into two categories: “yes” (referent) and “no or not sure.”

The five questions about literacy influences and reading ability were examined through a series of one-way ANOVAs and Tukey Honest Significant Difference (HSD) tests using PCSAS. Effect size (ES) was also calculated from the post-hoc comparisons to determine the magnitude of specific comparisons by dividing the mean difference by the pooled standard deviation. Effect size values provide an indication of the magnitude of observed differences, and in a practical sense, show the size of differences between means. Effect sizes of .20, .50, and .80 indicate small, medium, and large effects, respectively (Cohen, 1988). Small effect sizes are generally not conceived as being practically important, whereas medium and large effects are believed to be important.

Results

Self-Rated Health

‘Excellent’ self-rated health was reported by 21.0% ($n = 51$) of the sample, 39.3% ($n = 96$) of the sample reported ‘very good’ health, 31.1% ($n = 76$) reported ‘good’ health, 6.6% ($n = 16$) reported ‘fair’ health, and 2.1% ($n = 5$) reported ‘poor’ health. These estimates are consistent with findings from a large, international study of adolescent self-rated health (Cavallo et al., 2006). Each literacy influences and reading ability item was cross tabulated with fair or poor self-rated health (see Table 2). When literacy influences and perceived reading ability decreased, self-rated fair or

poor health generally increased, providing additional evidence of the validity of the study measures.

ANOVA Analyses

Preliminary analyses of variance (ANOVA) indicated that gender ($F = 0.30$, $p = 0.59$) did not significantly affect self-rated health. As a result, additional analyses did not adjust for gender. However, all analyses were adjusted for socioeconomic status per the question, “Are you eligible for free or reduced-priced lunch?”

Students’ Ability to Read the Survey

Significantly poorer self-rated health was detected for those who reported ‘having some difficulty reading the survey’ ($F(1,243) = 16.33$, $p < .0001$) ($M = 1.93$, $SD = 0.87$) when compared to those who reported the survey was ‘easy to read’ ($M = 1.20$, $SD = 1.26$) ($ES = .71$). These results suggest that the mean differences in self-rated health were significantly lower for students who reported difficulty reading the survey when compared to students who did not report difficulty reading the survey and that this difference was of large practical significance.

Students’ Reading Outside of School

Although a hypothesized trend in reported excellent to poorer self-rated health was detected as students moved from reading ‘always or most of the time’ to ‘sometimes’ to ‘never or rarely’ outside of school, the relationship did not achieve statistical significance ($F(2,244) = 2.59$, $p = .078$).

Students’ Feelings about Reading Ability

Significantly poorer self-rated health was detected among students with negative feelings about their reading ability ($F(3,243) = 3.12$, $p < .05$). Post-hoc analyses detected significant differences between those who reported ‘love or like reading’ ($M = 1.16$, $SD = .96$) and those who reported ‘I do not like reading’ only ($M = 1.72$, $SD = 1.04$) ($ES = .42$). These results suggest that the mean differences in self-rated health were significantly lower for students who reported disliking reading when compared to those who reported enjoying reading. This difference was of moderate practical significance.

Students’ Seeing a Parent or Caregiver Reading

Significantly poorer self-rated health was detected among students not seeing a parent or caregiver reading ($F(2,240) = 3.11$, $p < .05$). Post-hoc analyses detected significant differences between those who reported ‘each day’ ($M = 1.16$, $SD = 0.90$) and ‘0 days or not sure’ ($M = 1.49$, $SD = 1.08$) ($ES = .26$). These results suggest that the mean differences in self-rated health were significantly lower for students

who reported not seeing (or were not sure they saw) a parent or caregiver reading when compared to those who reported seeing a parent or caregiver reading each day. This difference was of modest practical significance. No other significant findings were detected for this variable.

Students' Visiting a Public Library or Bookstore during the Last Year

Significantly poorer self-rated health was detected for those who reported not visiting or not sure if they visited a public library or a bookstore during the past year ($F(1,240) = 10.41, p < .001$) ($M = 1.67, SD = 1.09$) when compared to those who reported visiting a public library or bookstore during the past year ($M = 1.21, SD = 0.88$) ($ES = .78$). These results suggest that the mean differences in self-rated health were significantly lower for students who reported not visiting (or not sure if they visited) a library or bookstore when compared to those who reported they had in the past year. This difference was of large practical significance.

Discussion

This preliminary study investigated the impact of perceived literacy influences and reading ability on the self-rated health status of seventh and eighth grade public school students. Five questions on literacy influences and perceived reading ability displayed moderate to substantial test-retest reliability over a two-week period. Students were significantly more likely to report poorer self-rated health if they reported having difficulty reading the survey, did not like reading, did not, or were not sure if they saw a parent or caregiver reading during the past two days, or had not visited a public library or bookstore during the past year ($p < .05$). In addition, the modest (e.g., not enjoying reading, not seeing a parent or caregiver reading) to large effect sizes (e.g., not visiting a public library or bookstore and having difficulty reading the survey) for each significant finding indicates that these findings are of practical importance. In addition, these findings were significant even after controlling for socioeconomic status (via free or reduced-priced lunch). These results are the first to quantify how early in life literacy influences and perceived reading ability may be associated with self-rated health status among adolescents.

This study shows the importance of literacy influences and perceived reading ability as potentially key indicators of self-rated health status, which is a strong predictor of actual and future health status

(Boardman, 2006). This is important to note because recent research has examined whether refocused efforts on improved education would reduce more mortality than improved medical advances. It is estimated that “each year, an average of 195,619 deaths would have been averted if mortality rates among adults with inadequate education had been the same as mortality rates among college-educated adults” (Woolf, Johnson, Phillips, & Phillipsen, 2007, p. 680). This is compared to an average of 25,456 lives saved each year through medical advances (e.g., drugs and other medical devices).

The solutions for improved health status are complex. In a consistently cited paper by the Partnership for Clear Health Communication (2003), literacy predicts an individual's health status more strongly than age, income, employment status, education level, and racial or ethnic group. The current study seeks the effects of the independent variables (e.g., literacy influences and perceived reading ability) of youth on the dependent variable of self-rated health status.

In the present study, the public library and or local bookstores were two hypothesized venues for educational and entertainment resources. Students may not have access to these community places if parents are not able to take the time or are not able to transport their children to libraries and bookstores. Although speculative, it is likely that parents who live and model positive literacy-related behaviors also place higher value on preventive health behaviors for themselves and for their children, which may result in enhanced self-rated health status. In the current study, if value was placed on literacy-related behaviors by parents who model going to a library or bookstore and are observed reading by their children, positive influences may result for youth. Social Cognitive Theory (Bandura, 1986) suggests that these modeling behaviors (both vicarious and direct) would likely influence children's reading behaviors (e.g., enjoyment of reading and reading outside of school for pleasure). In addition, parents and educators can provide children with normative feedback when performing above average on academic assignments that involve reading tasks.

Baker, Scher, and Mackler (1997) investigated family influences on children's motivations for reading. These researchers found that parents' beliefs about the educational and entertainment purposes of reading played an important role in whether their children initiated interaction with print resources at home. The Learning Policy Directorate of Canada (see Frempong

& Ma, 2006) has recognized that parental involvement is related to the academic achievement levels of children, because children not only learn from models, but modeling actions affect one's efficacy beliefs (see Schunk & Pajares, 2005, for a review). Consequently, it comes as no surprise that confident students welcome challenging goals (Zimmerman, Bandura, & Matinez-Pons, 1992) and persist longer than those who lack confidence (Zimmerman, 2000).

From a resource theory perspective (see Diener & Fujita, 1995), the differences observed between students with increased literacy-related skills and those with lower literacy-related skills, in terms of self-rated health, may also be explained in terms of resources available to meet these children's needs. Resources of material, social, or personal value can help individuals make progress toward personal goals. Resource theory indicates that people with more assets are better able to fulfill their needs relative to people with fewer assets. Thus, these findings suggest that children whose parents may not value and model literacy-related skills may have fewer economic, social, and personal resources than children whose parents value and model literacy-related skills, thereby limiting their children's exposure to positive life experiences. Such statements are further bolstered because our analyses adjusted for SES (via free or reduced-priced lunch). Brown, Teufel, and Birch (2007) suggested that students may turn to peers and technological media as a source of health information if they do not see their parents as a main source for health information.

Limitations and Directions for Further Research

Limitations of this preliminary study include the use of a convenience sample that may not be nationally representative and the use of a cross-sectional study in which no temporal sequence of literacy influences and students' perceived reading ability could be determined as a precursor of self-rated health status.

Additionally, this preliminary study did not attempt to measure reading skills directly, but to query participants in their perceived reading abilities using five questions. However, previous research by Day and Jankey (1996) concluded that, although objective life circumstances are important in individuals' determinations of the quality of their lives, it is their subjective interpretations and evaluations of their experiences that are most crucial. Similarly, as observed by Csikszentmihalyi (1990), subjective experience is not just one of the dimensions of life, it is life itself. In addition, some questions had to be collapsed due to small cell sizes for analysis. Further studies will need to control for

these issues by conducting more extensive pilot testing of the literacy-related questions, including more comprehensive item development.

Although schools have achievement tests in reading, which are reported to state departments of education under the No Child Left Behind (NCLB) policy, this study did not attempt to correlate self-rated health status with actual reading achievement scores. Future studies should do so since an individual's beliefs influence actual ability (Maddux & Gosselin, 2003; Schunk & Pajares, 2005). Linking self-rated health status with federal mandates derived from reading and math scores may assist schools in broadening their academic curriculum back to pre-NCLB status. In an earlier study predating NCLB legislation, Schoener, Guerrero, and Whitney (1988) reported that the reading and math scores of third and fourth grade students who received comprehensive health education instruction were significantly higher than those of students who did not receive comprehensive health education instruction. Thus, the relationship of reading and math scores to health instruction warrants further study, including the ways to access health-related information outside schools.

Conclusion

According to a Position Statement on Young Adolescent Literacy (International Reading Association, 2007), students during the middle school years "refine their reading preferences, become more sophisticated readers of informational text, and lay the groundwork for lifelong reading habits." Because of the importance of literacy, the International Reading Association and the National Middle School Association urge school professionals and families to support young adolescents who can use reading "to help answer profound questions about themselves and the world." Ongoing development of research in this area should include the promotion of basic literacy skills as foundational to health-related skill development advocated by National Health Education Standards (Ubbe & Zullig, 2006) and by the Secretary's Commission on Achieving Necessary Skills Report (SCANS, 1999), which recommended that young people develop the basic literacies of reading, writing, speaking, listening, and computing to succeed after graduation. As some have suggested (see Pajares, 2009), student academic difficulties are directly related to beliefs that they cannot, for example, read, write, or perform mathematics adequately, even though this may not be objectively true, and these beliefs are rooted in a variety of places.

Results from this preliminary study help to quantify how early in life that literacy influences and perceived reading ability may be associated with self-rated health status. This research supports observed findings with adults that academic achievement is associated with positive life outcomes. For instance, among a sample of over 575, 000 adults, the Centers for Disease Control and Prevention (2000) found that the largest differences in self-rated health were between those who did not complete high school and those with a high school education or greater (p. 34). Future research should explore the relationships between literacy influences, reading ability, and health status at even earlier grades. Information is also needed on the health literacy skills and reading practices of parents and their caregivers and their impact on children's self-rated health status from an ecological and cultural perspective.

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