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Trends in Student Perceptions of Classroom Practice and Engagement

Abstract:

In the late-1990s, education policymakers began a process of curriculum reform with the goal of transforming Chinese schooling from exam-oriented education to student-centered learning. Traditional education practices have expected students to passively accept and memorize material presented by teachers, and to reproduce the knowledge on often high-stakes examinations. The new curriculum is designed to reduce teacher-centered instruction in favor of student-centered learning characterized by active learners creatively solving problems, challenging existing knowledge, and participating in lively discussion. Despite such a dramatic shift in curriculum policy, little is known about the whether reform efforts are truly transforming the educational experiences of students. In this paper, we describe these changes in curriculum policy. Second, using data from three waves of the Gansu Survey of Children and Families (2000, 2004, 2007), we investigate how student perceptions of classroom and teaching practices have changed as over time as the new curriculum has been implemented. Finally, we examine the relationship between new curriculum practices and student engagement. The perspective of the students is a crucial dimension to understanding the shift in the practices of teaching and learning that seek to cultivate creativity and innovativeness in students to bolster China's entrance into the global information age.

"…by the time we got to the fifth paragraph the teacher asked us about the scenery and objects that were described in the text. Because we said the wrong thing the teacher got very angry with us and we felt terrified. Ever since then when the teacher asks us questions none of us dare to answer. Even if we have thought of the right answer we will not dare to speak because we are afraid of saying something wrong and that we will once again be criticized…"

Sixth grade student in Gansu, 2004

Introduction

During the past decade Chinese educational reformers have been concerned about the quality of education delivered in the Chinese education system. Educational reformers, argue that examination-oriented education hinders the cultivation of creative, innovative citizens capable of self-expression and cooperation who can contribute towards building a competitive nation in the contemporary global knowledge economy. Just as important, and evident in the quotation above, teaching practices associated with examination- oriented education may give rise to alienation from schooling and a lack of engagement and love of learning, as well as create too great a psychological burden on students. These concerns have led to the implementation the wide reaching New Curriculum reforms that have aimed for a transformation of teaching practices and classroom environments to foster new capabilities in students and enhance student engagement.

New Curriculum reforms[1] began experimental implementation in several provinces and counties across China in 2001 and achieved widespread national implementation in primary school classrooms by the year 2005 (Wen & Yang, 2005). They have involved an overhaul of all curricular materials and heavy investment in teacher training to foster teachers' new beliefs and practices about teaching and learning. Textbooks have been revised to be more engaging, more interactive, and more relevant to students' lives. Teachers have been called upon to put students at the center of learning, use praise and encouragement to motivate students instead of fear and punishment, to boldly experiment with new innovative approaches such as inquiry learning and small-group work. Although, the first steps towards the sweeping reform of curriculum were

taken a decade ago, we know little about whether these reforms have transformed the schooling experiences of Chinese students, particularly those who reside in China' remote, rural interior regions (Marton, 2006; Beijing Report, 2006).

This paper traces changing classroom practices and student engagement and stress in one poor, interior province, Gansu province, from 2000, before the implementation of the New Curriculum, to post implementation in 2007. Drawing on student reports from longitudinal survey data, we investigate four questions. First, have student reports of classroom practices changed over the course of the New Curriculum implementation period? Second, have student reports of student engagement and stress changed during this period? Third, do changes in classroom practice and student engagement and stress reflect New Curriculum policy ideals? And finally, are student engagement and stress associated with student perceptions of classroom practices, controlling for other student, teacher, and school characteristics?

The New Curriculum reforms and shifts in teaching practices

In the late-1990s, education policymakers began a process of curriculum reform with the goal of transforming Chinese schooling from traditional exam-oriented education to student-centered learning focused on the development of the whole person. The traditional model of learning focuses on mastery, practice, rote memorization and discipline. It emphasizes the role of the textbook and teacher as the source and conveyor of knowledge. Students are expected to listen and learn the materials, to accept the information presented by their teachers, and reproduce the knowledge on high-stakes examinations. Paine (1990, 1992) gives detailed descriptions of traditional teaching practices in China that were prevalent in the 1980s and 1990s with the teacher standing in front of the class lecturing, reading out loud or asking questions of the students. The teacher's use of questioning was directed at helping students to master and

review the content of the textbook. Students rarely posed critical or reflective questions to each other or the teacher. Practice, rote memorization, and drill were frequently employed to assist students in achieving mastery of the knowledge contained in the textbook. These practices reinforced the traditional view of teaching that is "text-driven and teacher-dominated" and conveyed a consistent message: teachers have authority because of their deep and correct knowledge of accepted texts, and their authority grows as they devote more time to study and teaching.

During last two decades, criticism of traditional teaching practices and examination oriented education has been voiced by policymakers, educators, parents, and the Chinese media. There has been growing concern that heavily examination-centered education is not only harmful to student's well-being, leading to undue psychological burdens and alienation from schooling, but is also ineffective in cultivating the skills and dispositions that are necessary for competition in the global information society (Ministry of Education, 2002). Educational experts argue that qualities such as creativity, innovation, cooperation, self-expression, and high levels of engagement cannot be effectively cultivated in a traditionally teacher-centered and exam-oriented classroom (Zhong, Cui, & Zhang, 2001). Instead, policymakers have called upon teachers to practice loving, praising, and encouraging students while creating a classroom environment that is more relaxed and open, fostering discussion and inquiry (Ministry of Education, 2002).

New Curriculum reform policies have called for a shift from the overemphasis on book knowledge and teacher-centered learning to a student-centered model of learning characterized by active learners, creatively solving problems, challenging existing knowledge and participating in lively discussion. This has required a new emphasis on methods and process in the classroom

with the goal of increasing student participation and engagement, such as the use of open-ended questions, and questions with multiple possible solutions and the increased practice of student praise and encouragement. New Curriculum also aims to foster student engagement by establishing a closer connection between the topics studied at school and the needs of the locality and contemporary society. As captured in the excerpt below, the new policy promotes a more relevant school curriculum; calling for schooling materials and teaching practices to take into consideration students' interests, experiences, and developmental needs.

> Classroom teaching should lay emphasis on the student's own thinking process…This requires the teacher to be good at creating an open classroom environment, fostering a positive and comfortable atmosphere and encouraging students' expressions of new, different and unconventional ideas…Teachers must work hard to protect students' curiosity, desire for learning, and imagination…Learning arises out of questioning (Ministry of Education, 2002).

In this way, the success of the New Curriculum should be measured not only by an increase in more student-centered approaches to teaching and learning, but also by higher levels of student engagement. Reformers believe that active and engaged students will learn more and stay in school longer.

Student engagement, Schooling Outcomes, and Classroom Practices

Student engagement is a multi-facet construct that encompasses students' behavioral, cognitive, and emotional investment in learning (Fredericks et al, 2004). Several researchers have linked measures of student engagement to student retention and achievement (Connell, Spencer, & Aber, 2004; Farkas et al, 1990; Finn & Rock, 1997; Johnson, Crosnoe & Elder, 2001; Klem & Connell, 2004). Engaged students, who are more connected to school and more willing to study, are more likely to stay in school (Bryk & Thum, 1989; Jenkins, 1995; Finn & Rock 1997) and to earn higher grades (Coleman & Colling, 1991; Finn, 1989). Eventual school drop-out is associated with lower levels of measures of academic engagement when in school such as

less homework completion, less effort in class, and lower participation in classroom activities (Ekstrom et al, 1986). Some research suggests that students who enjoy school and engage in supportive relationships with their teachers can cope better with academic stress (Good & Brophy, 1986). Just as importantly, engaged students are less likely to participate in behaviors that might adversely affect academic progress (Finn & Rock, 1997). In this way, a student's degree of engagement with schooling is an important influence on academic persistence and achievement, and ultimately, future life chances. As such, the concept of engagement has attracted the attention of educational policymakers and practitioners alike as a potential means for increasing learning and reducing drop-out.

One avenue of research has explored the ways in which teaching practices and teacher support can enhance students' engagement with schooling (Kelly & Turner, 2009; Metz, 1986/2003; Wentzel, 1998; Furrer & Skinner, 2003; Klem & James, 2010) Students who feel connected to and cared for by their teachers are more likely to report higher levels of psychological well-being and engagement with school (Conwell & Wellborn, 1991; Good & Brophy, 1986). In a study of classroom management techniques and student achievement, higher levels of emotional support from teachers was associated with greater student interest in school (Good & Brophy, 1986). Research also suggests that teacher support, both demonstrable and perceived, provides disadvantaged students with a sense of safety and opportunity for success (Suarez-Orozco et al, 2009). n addition, students' perceived connectedness with their teachers may be a protective factor among students at risk for dropping out (Fine, 1991). Teaching practices that promote student-centered learning also connected to engagement (Blumenfeld, Puro, & Mergendoller, 1992). One pathway to engagement may be increased student participation in classroom activities. In classroom environments in which students are

apprehensive about making mistakes, students are more likely to experience feelings of alienation (Finn, 1989; Kelly & Turner, 2009; Mehan, 1979). As such, the common classroom practices utilized by teachers is an important contributor to student engagement.

Student engagement in rural China

The role that students' day-to-day experiences in school play in promoting educational persistence and performance have been little studied in rural China. For many years, the educational discourse has been dominated by ways to promote access to schooling and reduce the financial burdens associated with schooling experienced by poor rural families (Adams & Hannum, 2005; Hannum & Adams, 2008; Hannum 2003). The most recent statement on tuition is the revised Compulsory Education Law, which came into effect September 1, 2006. This law gives children in both cities and the countryside nine years of free compulsory education, but tuition charges will not be completely waived immediately (*People's Daily* 2006). China offered nine-years of education free to children in its rural areas in 2010 and plans nationwide implementation by 2015 (CERNET 2005). However, as enrollment rates rise, exploring mechanisms to keep children in school and promote learning become more important. In rural areas, students continue to dropout of school during nine year compulsory schooling (Guo, 2004). Studies have found that contrary to popular perception, economic reasons are no longer the leading cause of dropping out, but rather disaffection and boredom in school (Hannum & Adams, 2008; Zhu, 2007).

In China, curriculum reform has been credited with creating a more positive environment in primary school classrooms and greater student engagement (Feng, 2006; Sargent, 2009; Guan & Meng, 2007) as well as with fostering more harmonious teacher-student relationships (Zhao, 2004). This study uses rich data to test whether or not this is in fact the case. Using cross-

sectional data describing student perceptions of their learning environment during different time periods, this study makes several new contributions to our understanding of the impact of the New Curriculum reforms on student engagement, student stress, and student experiences in the classroom. First, this is the first study using probability samples that examines students' perceptions of classroom practices before and during and after the implementation of New Curriculum reforms. Second, the study contributes to our understanding of the factors that influence student engagement and stress by empirically testing whether student perceptions of teaching practices are associated with measures of student engagement and stress. Finally, and of great interest to policymakers, our paper reveals whether classroom teaching practices are more aligned with the specific goals of curriculum reform.

Study Site and Data Source

This study focuses on primary school students and teachers in rural areas of Gansu, a poor, interior province in northwestern China. Although we cannot claim that the picture we provide in our analysis is representative of students' experiences across China, examining the impact of curriculum efforts in a remote and impoverished province may provide a more conservative estimate if compared with China's more prosperous coastal and urban areas, of the extent to which curriculum reforms are altering classroom practices and students' perceptions of schooling.

These analyses employ data from the 2000, 2004, and 2007 waves of the Gansu Survey of Children and Families, a multi-level, interdisciplinary survey of children, their families, schools, and communities in rural Gansu province. A multi-stage cluster sampling method—selecting counties, townships, villages and then children from birth registries—was used to draw the primary sample of school-aged children. For the year 2000, we use the primary sample of

target children, ranging from 8-13 year-olds. In 2004, in order to compare student perceptions and engagement of primary school-aged children with those of the children in 2000, we use the linked sample of the target child's oldest younger siblings[2]. In the year 2007, we analyze a sub-sample of 8-13 year-old primary students from newly drawn random sample of children aged 8-16 year-olds. In each year, we link the children to family, school, and homeroom teacher characteristics. The timing of data collection coincides nicely with the implementation of the New Curriculum reforms. The 2000 wave was collected just before any reform implementation began, and in turn, it provides a baseline description of classroom practices and student perceptions of schooling. The 2004 wave data allows us to descriptively observe the early years of the New Curriculum reform implementation before the comprehensive implementation of the reforms in the year 2005 in schools across China. The 2007 wave provides an opportunity to examine reform practices, student engagement, and student stress after the major investments in reform implementation.

Measuring the Impact of the New Curriculum

Table 1 presents descriptive statistics for all variables included in the regression analyses using the 2007 data. The student data consists of controls for the students' social origin and for their homeroom teachers' characteristics. Student social origin data consists of a continuous variable for students' age which ranges from 8-13 as well as student gender (coded 0 if female and 1 if male). As indicated in Table 1, 57% of the analytic sample in 2007 is male. Family wealth is also included as a control predictor; the sample average value for the log of family wealth is 8.70. Mother's education measured in years is also included to capture students' family background; in this rural sample, the average educational level of mothers is approximately 5 years of schooling. In addition to family background characteristics, we include

three teacher characteristics that are associated with student engagement: teacher gender, teacher education, and teacher experience. Table indicates that 60% of the students' homeroom teacher are male. Approximately 61% of these teachers have completed post-secondary education. Interestingly, more than half of the teachers are veteran teachers, having taught more than 10 years.

< Insert Table 1 here >

Student perceptions of classroom practice

One way to determine whether student's classroom experiences have changed during the implementation period of the New Curriculum is to examine student reports of classroom practice over time. In the survey, students were asked whether they agree or disagree with several statements related to classroom practice. We selected four statements that were closely aligned with the more student-centered, participatory, and encouraging practices promoted by New Curriculum Policy: 1) *If I study hard, the teacher will praise me*, 2) *The teacher encourages us to ask questions*, 3) *We usually discuss problems together animatedly*, and 4) *In class the teacher generally lectures and we listen*.

Student Engagement and Stress

Because New Curriculum reform aims to not only change the way that teachers teach, but also hopes to foster students' engagement and reduce student stress, we also investigate trends in student reports of engagement and stress throughout the period. Investigating student engagement provides an opportunity to consider whether the classroom practices associated with the New Curriculum have been effective in increasing student's interest in learning. In our analyses, we include measures that capture the extent to which students enjoy school and participate in classroom activities. Students were asked whether they "strongly disagree,"

"disagree," "agree," or "strongly agree" with several statements about attitudes school: 1) *I am happy at school*, 2) *I like to participate in class*, 3) *I do not want to go to school*, 4) *I often feel bored at school*, 5) *I enjoy learning*, and 6) *If I work hard, I can do well*. In our descriptive analysis, we present each of these items separately for each of the years. We also use these student perceptions to create a student engagement summative scale (Cronbach's alpha=0.69). The scale was constructed by standardizing and summing the student responses to the six items listed above. Students were also asked questions to measure their levels of stress and anxiety. They were asked about the following statements using a 4 point scale ranging from whether they "strongly disagree" to "strongly agree": 1) *I am easily frustrated or anxious*, 2) *There is always something to worry about*, 3) *I often feel nervous*, and 4) *I feel inferior (academically) to others*. We also use these measures to create a student stress summative scale (Cronbach's alpha=0.68) for use in our regression analyses investigating the links between student stress and classroom practices.

The analysis proceeds in three parts. First, we examine student reports of their teachers' practices across three waves of the survey, testing whether there are significant differences in student perceptions of classroom practices during the time in which the New Curriculum was implemented; specifically, we test for differences between 2000 and 2007.[3] According to student reports, are teachers lecturing less in 2007 compared with 2000? Are they praising students more? Is there more classroom discussion? And are students encouraged to ask more questions? We hypothesize that more students will report classroom practices associated with the New Curriculum reforms, such as animated classroom discussion and teacher praise in the later year, 2007. Next, we examine trends in student engagement and stress over the same period of time, speculating that students will be more engaged and less stressed in the later waves of the

survey. Again, we test for significant differences in indicators associated with engagement and stress between 2000 and 2007. For instance, do fewer students report feeling bored at school? Do more students want to participate in classroom activities? Do fewer students feel anxious or worried about school? Finally, we utilize both random effects and fixed effects regression models to investigate whether there is an association between classroom practices associated with the New Curriculum and student engagement and stress in the most recent year of the survey, 2007.

Trends in student reports of classroom teaching practices, 2000-2007

Figure 1 presents the percentage of students who agree with each statement about classroom practice in 2000 – just before the implementation of the New Curriculum, in 2004 – in the early years of implementation, and in 2007 – after implementation[4]. Surprisingly, the results do not illustrate a significant difference in the percentage of students reporting teacher praise during the period of the New Curriculum reform (χ^2=0.30). Similarly, there is no significant difference in the percentage of students reporting that they are encouraged to ask questions (χ^2=0.20, $p<0.05$). Interestingly, a slightly greater and significantly different percentage of students report having animated discussions in class in 2007, 78 per cent compared with roughly 74 percent in 2000 (χ^2=5.94). The most striking change during this period is in teacher lecturing with significantly fewer students, 69 per cent, reporting that their teachers generally lecture and they listen in 2007 compared with 81 per cent in 2000 (χ^2=47.56, $p<0.001$). At first look, these measures of classroom practices suggest that students' perceptions of their day-to-day experiences in the classroom have changed very little between 2000 and 2007. Most notably, the data reveal a significant reduction in student reports of lecturing by teachers in 2007. This finding may suggest that teachers have find it easier to stop particular practices, such as

lecturing, but find it more difficult to implement new teaching behaviors, such as praising students and encouraging critical questions.

< Insert Figure 1 here >

Trends in student engagement and stress, 2000-2007

Figures 2 and 3 illustrate trends in student engagement and stress during the same period of New Curriculum implementation, 2000-2007. Figure 2 illustrates several trends suggesting that student engagement has increased during this period. First, a significantly higher percentage of students report being happy at school (χ^2=6.69, p<.0.05), 87 per cent in 2007 compared with 82 per cent in 2000. Second, a significantly fewer percentage of students report feeling bored at school (χ^2=43.46, p<0.001) or feeling like they do not want to go to school (χ^2=3.94, p<0.05). Figure 2 shows very little difference in two other indicators of school engagement; the percentage of students reporting that they enjoy school and the percentage of student who feel if they work hard, they can do well is not significantly different in 2007 compared with 2000. Surprisingly, the percentage of students who want to participate in class is significantly less in 2007 post New Curriculum reforms (χ^2=23.52, p<0.001). Overall, this descriptive figure suggests that when compared with the pre-New Curriculum period in 2000, students report higher levels of engagement – less boredom and less not wanting to go to school as well as more happiness at school – in 2007.

< Insert Figure 2 here >

Taken together, the data presented in Figure 3 illustrates that percentage of students who report feeling school-related stress and anxiety is significantly lower in 2007 compared with 2000. The percentages of students who report feeling anxious or nervous about school are approximately 10 percentage points lower in 2007; these differences are significant (anxious

χ^2=20.88, p<0.001; nervous χ^2=26.17, p<0.001). Other indicators of stress and anxiety are also significantly lower in 2007 when compared with 2000. In 2000, the pre-curriculum reform period, 46 per cent of students reported feeling frequently worried about school compared with 35 per cent in post reform in 2007 (χ^2=27.48, p<0.001). Figure 3 displays an even more dramatic decrease, 15 percentage points, in the number of students who report feeling inferior to others in 2007 (χ^2=65.68, p<0.001). These results demonstrate that students are reporting less psychological stress related to schooling in the post New Curriculum reform period. Teachers may indeed be creating more relaxed and open classroom environments characterized by less academic pressure, competition, and fear of failure and humiliation.

< Insert Figure 3 here >

Classroom practice, student engagement and stress, and the New Curriculum ideals

Altogether, student reports of classroom teaching practices, engagement, and stress during 2000, 2004, and 2007 reveal little change in the classroom teaching practices promoted and rather significant, positive changes in student engagement and stress reduction. Reformers have not only provided new text and materials aimed at transforming students' learning environments, they have also looked to the transformation of teaching practices as a pillar of these reforms. Our expectation that more students would report classroom practices associated with the New Curriculum reforms proved false. Our comparison of student reports in 2000 and 2007 do show dramatic changes in classroom practices. In particular, students do not report an increased use of teaching behaviors promoted by the New Curriculum, such as encouragement to ask questions and teacher praise in the later years. The only significant change in classroom practice reported by students during this period that reflects the ideals of the New Curriculum is a slight increase in number of students reporting animated discussion and a considerable

reduction in teacher lecturing. Notably, the decrease in the percentage of students who report that their teachers frequently lecture reflects teachers' efforts to limit traditional teacher-centered practices rather than their embrace of new classroom practices.

Surprisingly, although student reports provide little evidence of shifting trends in classroom teaching practices during this period, they do bring to light positive differences in students' perceptions of schooling and learning. Although our descriptive exploration cannot ascertain whether these improvements are associated with curriculum reform, the reformers without a doubt hoped that the reported changes would be cultivated by the New Curriculum. Educational policy documents associated with the New Curriculum are unambiguous in their concern about a generation of stressed-out and bored students who do not possess a love of learning. These same documents are clear in their promotion of the New Curriculum as an antidote to such problems. Student reports align with New Curriculum goals and support our hypothesis that more students would feel engaged and fewer students would suffer stress in 2007 after the implementation of the reform. Could the less frequent use of the teacher-centered practice of lecturing be associated with higher levels of engagement and lower levels of stress? Or might there be other factors account for these differences? We explore these questions by investigating the association between classroom practices promoted by the New Curriculum and student engagement and stress in 2007.

Are classroom practices associated with the New Curriculum, such as less teacher lecturing, more discussion, questions, and praise linked to higher levels of student engagement and lower levels of student stress in 2007?

To address this question we conduct multivariate analysis of student engagement and student stress. Each series of nested models begin with a random-effects regression model including specific classroom practices and either student engagement or student stress. Next, we

include characteristics associated with the students' social origin. This is followed by a model including controls for important teacher characteristics. In the final models, we include school fixed effects to account for unobserved differences at the school level.

Student Engagement

The main effects model, model 1 in Table 2 includes only the classroom practices associated with the New Curriculum. This models shows that students who report that they are encouraged to ask questions and that they have animated discussions in class have higher levels of student engagement, on average. Notably, teacher lecturing and teacher praise are not significant predictors of student engagement in this specification.

In Models 2 and 3, we include control variables for student background and teacher characteristics, respectively. Model 2 shows that older students, students from wealthier families, and students with more educated mothers have higher levels of engagement, on average. Importantly, Model 2 also demonstrates that the classroom practices, questioning and discussion, are positively associated with student engagement net of student family background. Model 3 indicates that although both teacher education and teacher experience are significant predictors of student engagement, the effect of the classroom practices, questioning and discussion, is consistent in size and remains associated with higher levels of engagement.

The incorporation of school fixed effects in Model 4 does not change the overall story from Model 3. The classroom practices, teacher lecturing and praise, are not linked to student engagement. The classroom practices, questioning and discussion are associated with higher levels of student engagement, controlling for student background and teacher characteristics.

Student Stress

Model 1 in Table 3 includes only the classroom practices associated with the New Curriculum. This models shows that students who report that they are encouraged to ask questions have lower levels of stress, on average. Surprisingly, teacher lecturing is also associated with lower levels of stress ($p<0.10$). The classroom practices, discussion and teacher praise are not significant predictors of student stress in this model.

In the next two models, Models 2 and 3, we include control variables for student background and teacher characteristics. Model 2 indicates that family wealth and mother's education are negatively associated with student stress levels; students from wealthier families, and students with more educated mothers have lower levels of stress, on average. Model 2 also shows that the classroom practices, questioning and lecturing remain significant predictors of student stress, controlling for student family background. Unexpectedly, Model 2 shows that students who report more praise from their teachers have higher levels of stress on average controlling for the other variables in the model ($p<.10$). When we include teacher characteristics in Model 3, we do not find statistically significant associations with student stress. In Model 4, we include school fixed effects. This model indicates that the only New Curriculum practice associated with lower levels of student stress is teachers encouraging students to ask questions. Moreover, very few of the variables included in this specification are significant predictors of student stress, suggesting that other unobserved factors likely influence student stress levels.

Summary and Discussion

The findings in this paper suggest that teaching practices have been shifting over time, 2000-2007, in Chinese primary schools. To some degree, these changes reflect the classroom practices promoted by the New Curriculum. Specifically, students report significant changes

related to increased classroom discussion and decreased teacher lecturing between 2000 and 2007. Shifts in both of these classroom practices reflect the New Curriculum ideal of more active, engaged student-centered learning.

Our findings also demonstrated significant changes in measures of student engagement and stress during this time period. Students report significantly higher levels of happiness at school and participation in classroom activities in 2007 compared with 2000. They report significant lower levels of bored and disaffection from schooling during the same period. Just as importantly, student measures of stress, such as feeling worried and inferior, are significantly lower in 2007 when compared with 2000. While reducing student stress and increasing student engagement are key objectives of the curriculum reform in China, research to date has not empirically linked these outcomes with any of the classroom practices promoted by the reform.

Results from our multivariate analyses indicate that particular teaching methods are associated with increased student engagement and decreased stress, on average, even when we take in account family background and teacher characteristics. Encouragement to ask questions is associated with higher levels of engagement, and active discussion in class is associated with higher levels of student engagement and lower levels of student stress. More relaxed, open, and participatory environments could be portents of a new openness in Chinese society and may fuel increased creativity, innovation, and self-expression.

In recent decades, the quest to make schooling more student-centered has emerged in many nations. Perhaps most surprisingly, the more collectively-oriented and examination dominated educational systems in East Asian nations such as China, Korea, and Japan have embraced the belief that schools need to provide students with more than exam skills to prepare them for the future. Each of these nations have implemented new curriculum policies

emphasizing student autonomy, creativity, and problem-solving with the hopes of reducing rote memorization and exam pressure while developing creativity, initiative, and innovation. Educational policies promoting inquiry-based, research-based, and problem-based learning have been promoted as a way to develop citizens who are ready to compete internationally in the knowledge economy. In this way, the findings presented here are of great interest not only to educational policymakers in China, but also to other nations in the region grappling with similar reform. Some teaching practices are associated with increased engagement, but these practices are difficult to change. Just as importantly, teaching practices only explain a small amount of the variation in student engagement and even less variation in student stress. It may be other dimensions of the school environment condition student engagement and stress. Similarly, shifts in student, teacher, and societal attitudes about what knowledge and skills are most valuable may be the most important determinants of student engagement, stress, and overall well-being.

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Table 1. Descriptive Statistics for 8-13 year-olds in Gansu Province in 2007 (n=845)

Variable	Mean	Standard Deviation
Teacher generally lectures (Agree or strongly agree=1)	0.68	0.47
Teacher praises students when they work hard (Agree or strongly agree=1)	0.81	0.39
Teacher encourages students to ask questions (Agree or strongly agree=1)	0.90	0.29
Students have animated discussions in class (Agree or strongly agree=1)	0.78	0.41
Student engagement	1.66	0.40
Student stress	1.99	0.48
Student gender (male=1)	0.57	0.50
Student age	11.4	1.26
Log of family wealth	8.70	1.09
Mother's education (in years)	4.91	3.54
Teacher gender (male=1)	0.60	0.49
Teacher education (post-secondary graduate=1)	0.61	0.48
Teacher experience 1-5 years	0.28	0.35
Teacher experience 6-10 years	0.17	0.38
Teacher experience 11-20 years	0.19	0.39
Teacher experience >20 years	0.36	0.48

Data source: GSCF 2007

Table 2. Random effects regression model of student engagement on classroom practices among 8-14 year-olds in 2007 (n=845)

	MODEL 1 Classroom Practices	MODEL 2 Family Background	MODEL 3 Teacher Characteristics	MODEL 4 School Fixed Effects
Teacher lecture	-0.03	-0.01	-0.01	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Teacher praise	-0.03	-0.01	-0.01	-0.01
	(0.04)	(0.04)	(0.04)	(0.04)
Encouraged to ask questions	0.38***	0.35***	0.35***	0.36***
	(0.05)	(0.05)	(0.05)	(0.05)
Animated discussions	0.13**	0.12**	0.12**	0.13**
	(0.04)	(0.04)	(0.04)	(0.04)
Student gender (male=1)		-0.01	-0.01	-0.02
		(0.03)	(0.03)	(0.03)
Student age		0.04**	0.04**	0.04**
		(0.01)	(0.01)	(0.01)
Log of family wealth		0.03*	0.03~	0.03~
		(0.01)	(0.01)	(0.01)
Mother's education		0.02***	0.02***	0.02***
		(0.01)	(0.01)	(0.01)
Teacher gender (male=1)			-0.04	-0.04
			(0.03)	(0.03)
Teacher education (>secondary education=1)			0.08*	0.08*
			(0.03)	(0.03)
Teacher experience (comparison group <6 years				
Texperience 6-10 years			0.10*	0.11*
			(0.05)	(0.05)
Texperience 11-20 years			0.03	0.04
			(0.04)	(0.04)
Texperience >21 years			0.13**	0.16**
			(0.04)	(0.04)
School fixed effects				Yes
Goodness of fit				
R^2 within	0.08	0.13	0.15	0.15
R^2 between	0.01	0.03	0.04	0.03
R^2 overall	0.08	0.12	0.14	0.14

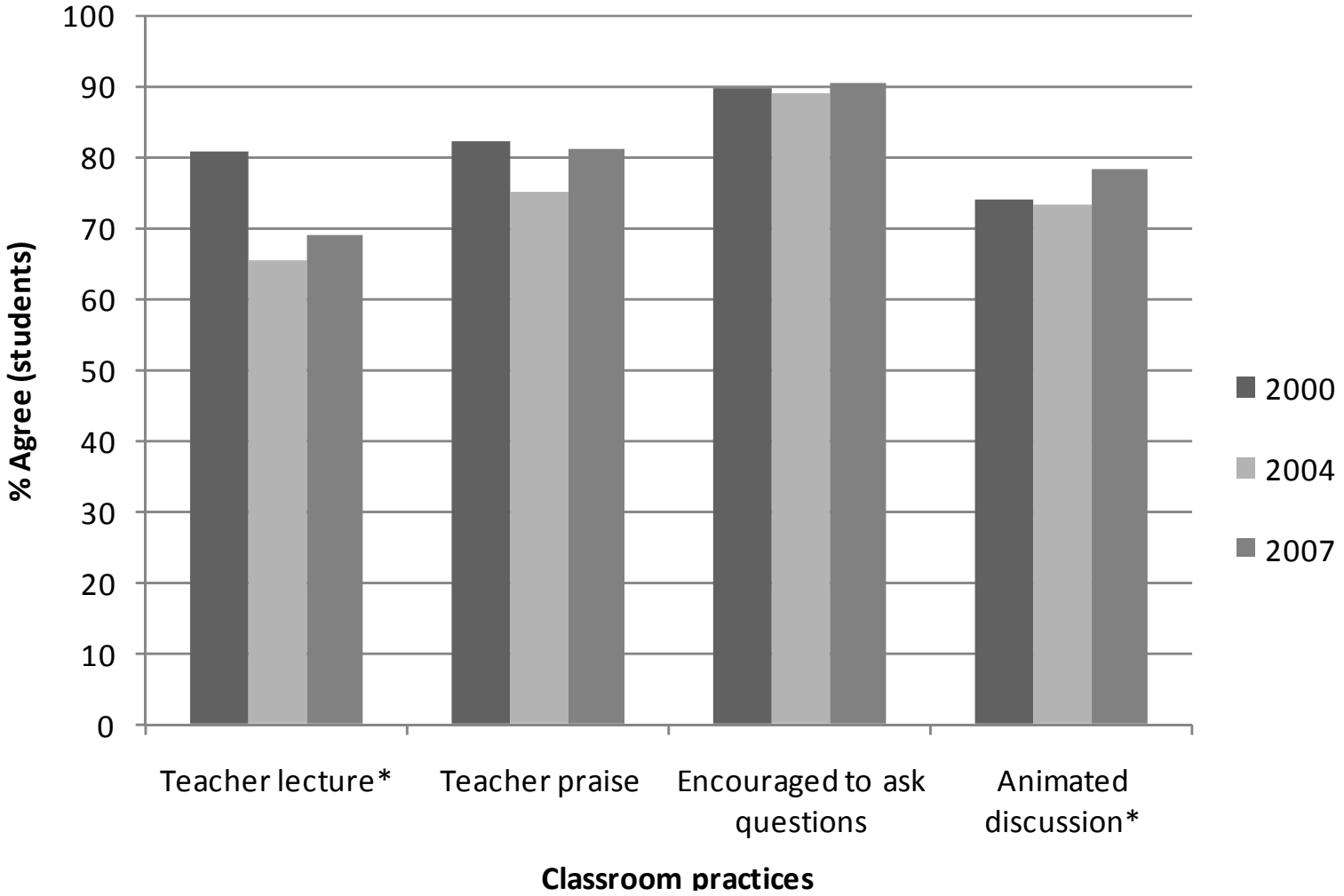
Source: GSCF 2007 ~p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 3. Random effects regression model of student stress on classroom practices among 8-14 year-olds in 2007 (n=845)

	MODEL 1 Classroom Practices	MODEL 2 Family Background	MODEL 3 Teacher Characteristics	MODEL 4 School Fixed Effects
Teacher lecture	-0.07~	-0.07~	-0.07~	-0.06
	(0.04)	(0.04)	(0.04)	(0.04)
Teacher praise	0.07	0.08~	0.07	0.07
	(0.05)	(0.05)	(0.05)	(0.05)
Encouraged to ask questions	-0.15**	-0.17**	-0.15*	-0.16*
	(0.06)	(0.07)	(0.06)	(0.07)
Animated discussions	-0.04	-0.04	-0.03	-0.03
	(0.05)	(0.04)	(0.05)	(0.05)
Student gender (male=1)		-0.03	-0.03	-0.03
		(0.04)	(0.04)	(0.04)
Student age		0.01	0.01	0.01
		(0.01)	(0.02)	(0.02)
Log of family wealth		-0.05**	-0.05**	-0.05*
		(0.02)	(0.02)	(0.02)
Mother's education		-0.01*	-0.01*	-0.01~
		(0.01)	(0.01)	(0.01)
Teacher gender (male=1)			0.02	0.01
			(0.04)	(0.04)
Teacher education (>secondary education=1)			-0.08	-0.09~
			(0.05)	(0.05)
Teacher experience (comparison group <6 years				
Texperience 6-10 years			0.01	-0.01
			(0.06)	(0.06)
Texperience 11-20 years			0.09	0.06
			(0.06)	(0.06)
Texperience >21 years			-0.04	-0.06
			(0.05)	(0.06)
School fixed effects				Yes
Goodness of fit				
R^2 within	0.02	0.04	0.04	0.04
R^2 between	0.05	0.20	0.13	0.11
R^2 overall	0.02	0.04	0.05	0.05

Source: GSCF 2007 ~p<0.10, *p<0.05, **p<0.01, ***p<0.001

Figure 1. Trends in student perceptions of classroom practices, 2000-2007



Data source: GSCF 2000, 2004, 2007

*indicates significant difference between 2000 and 2007

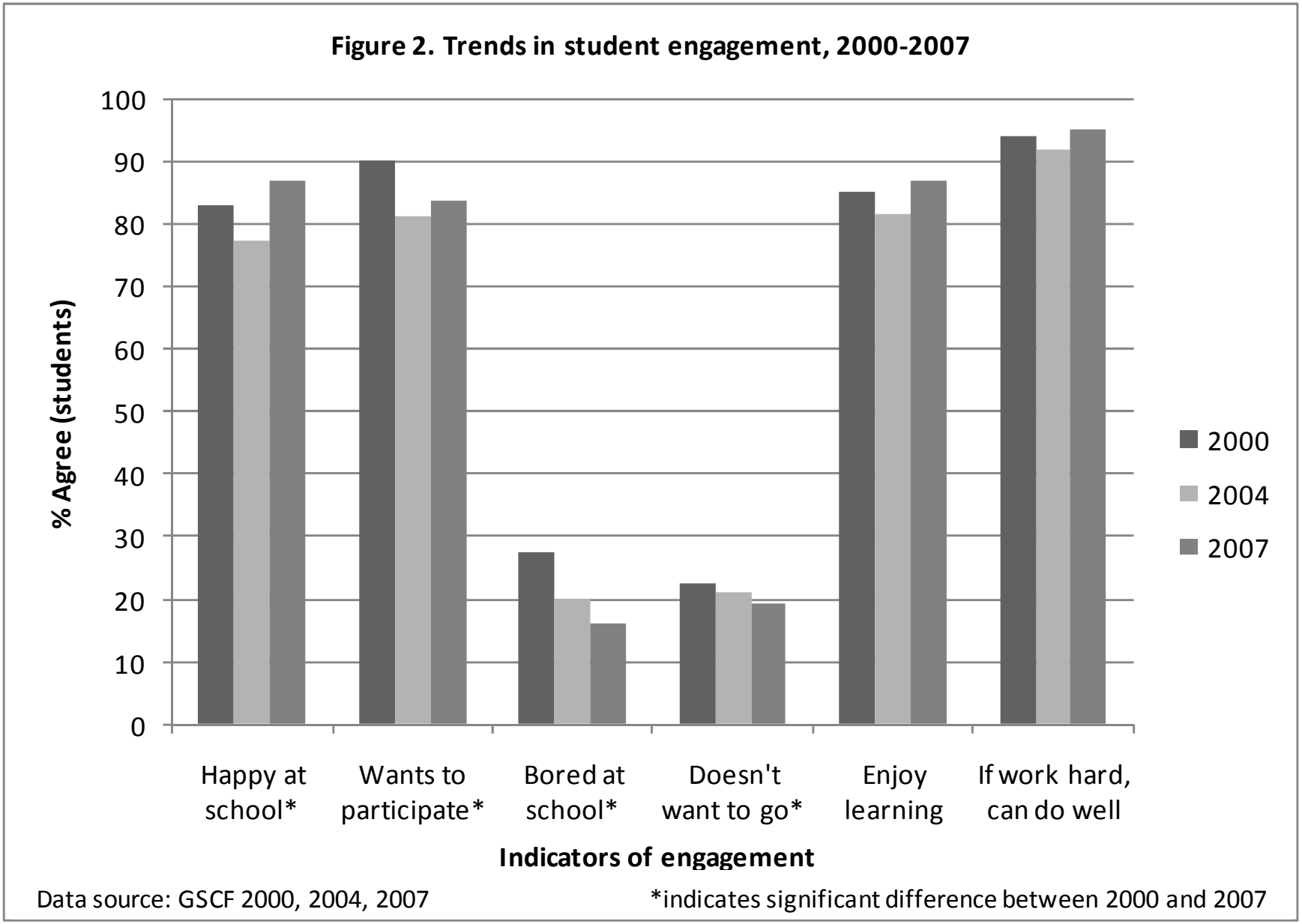


Figure 2. Trends in student engagement, 2000-2007
100
90
80
70
60
50
40
30
20
10
0
% Agree (students)
Happy at school*
Wants to participate*
Bored at school*
Doesn't want to go*
Enjoy learning
If work hard, can do well
Indicators of engagement
2000
2004
2007
Data source: GSCF 2000, 2004, 2007
*indicates significant difference between 2000 and 2007

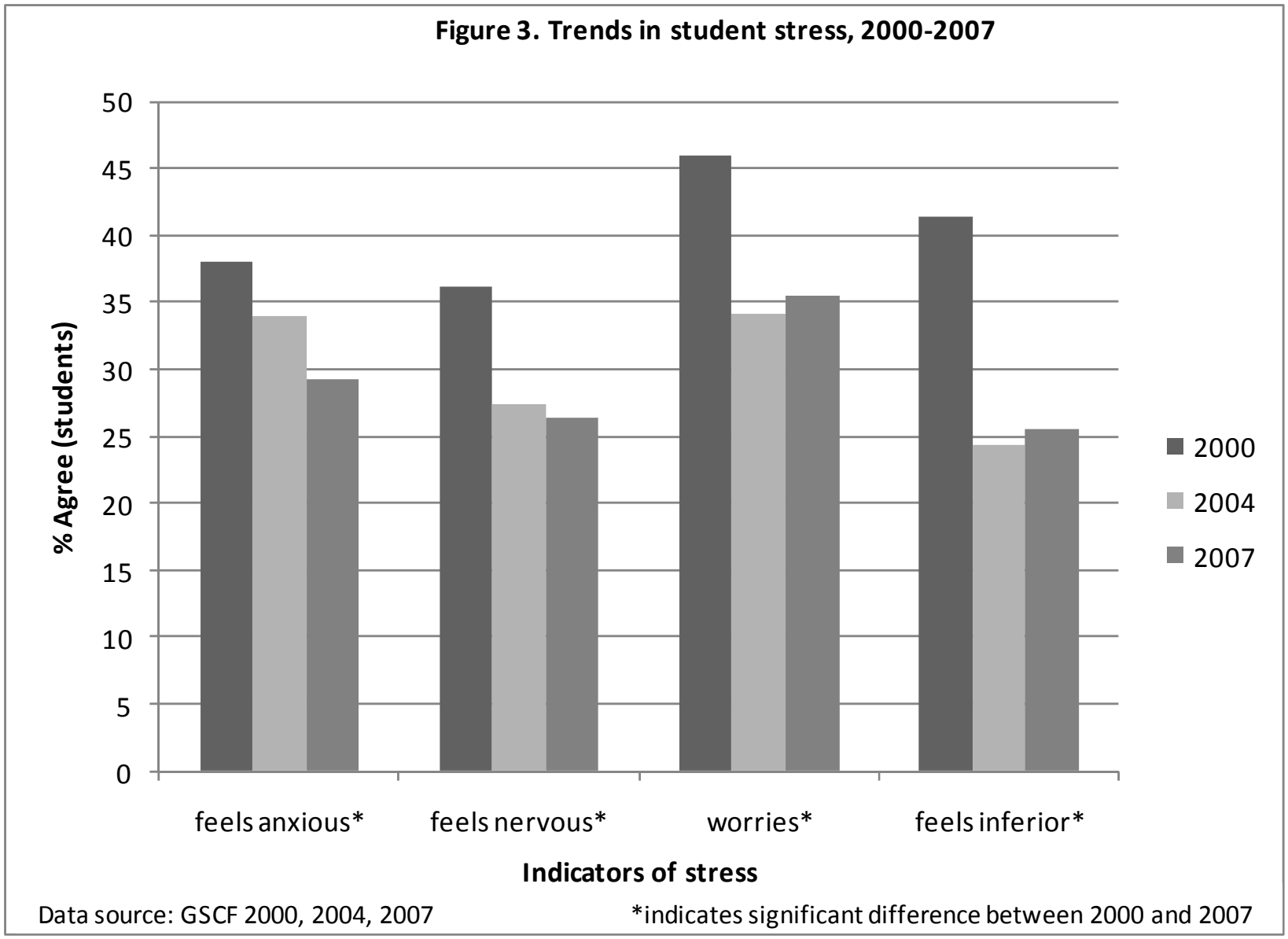


Figure 3. Trends in student stress, 2000-2007
50
45
40
35
30
25
20
15
10
5
0
% Agree (students)
feels anxious*
feels nervous*
worries*
feels inferior*
Indicators of stress
2000
2004
2007
Data source: GSCF 2000, 2004, 2007
*indicates significant difference between 2000 and 2007

Endnotes

[1] The guiding principle of the new curriculum is widely referred to as *suzhi jiaoyu*, which is often translated as "quality education," but generally meaning a more holistic approach to education.

[2] The sample of oldest younger sibling was gathered in 2004 only. It is a sample of nearly 800 children. For the purposes of this investigation, we limited the analytical sample to siblings who were aged 8-13 years-old.

[3] Because the 2004 sample consists of the sample of the oldest younger siblings of the target children (rather than an independent probability sample, we cannot test for statistically significant differences using the 2004 data. We present the data from 2004 for descriptive purposes only.

[4] The categories "completely agree and somewhat agree" have been collapsed to create the category "agree."