ESSAYS ON BUSINESS LOCATION, RECRUITMENT, AND THE ROLE OF EVALUATIONS IN THE UNIVERSITY CLASSROOM

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CHAPTER I

CONFECTIONERY MANUFACTURERS' LOCATION DECISIONS IN A POST NAFTA ENVIRONMENT

Introduction

The U.S. sugar program is one of the most debated and studied pieces of U.S. agricultural policy (e.g. Beghin, El Osta, Cherlow, and Mohanty 2003; Moss and Schmitz 2002; Rendleman and Hertel 1993). Disagreement exists between the sugar producers and industrial users of sugar, specifically the confectionery industry, on the impact of sugar policy on prices[1]. One of the primary tools that is used in these studies is general or partial equilibrium modeling to assess the welfare gains (or losses) to the U.S. economy from changing U.S. sugar policy. However, impacts on actual location and employment of confectionery manufacturers in the U.S. have not been frequently analyzed.

International agreements such as the North American Free Trade Agreement (NAFTA) and the Central American Free Trade Agreement (CAFTA) alter the trade flows of confectionery products due to the reduced tariffs that were negotiated. Figure 1 illustrates how trade flows were altered during the 1990s in part due to international agreements as Brazil was replaced by Canada and Mexico as the leading

[1] More detailed discussions of the U.S. sugar program as well as the industry in Mexico and Canada may be found in Alvarez and Popolous (2002) and the U.S. International Trade Commission (2001).

source of confectionery imports from the mid 1990s through the present. The confectionery industry is widely viewed as a "footloose" industry, which may produce multiple products in a single location because procurement or distribution costs are relatively low compared to production costs (Henderson and McNamara 1997). The Census Bureau's *Current Industrial Reports* (various issues) show that nearly a fourth of the confectioneries consumed in the U.S. were imported in 2006 up from roughly 16% in 2001. Though all of the increase in imports may not be a direct result of NAFTA (and CAFTA to a lesser extent), the increase indicates how quickly sources of supply can change in such a short time span in a footloose industry. Peter Buzzanell and Associates (2003) document that executives of many confectionery firms believe firm location will continue to move to areas where sugar costs and labor are cheaper than in the U.S. or Mexico and suggest that confectionery industries are likely to move to Brazil, Argentina, and other countries in Latin America.

Some of the sugar policy controversy revolves around the attempt to protect sugar production industries in the U.S. However, the International Trade Administration (2006) estimates that for every job saved in the growing and harvesting of crops to produce sugar in the U.S., three jobs were lost in the confectionery industry because of the higher cost of sugar as an input to confectionery products in the U.S. This estimate was based on press clippings from the 1990s that document the closing of confectionery factories throughout the U.S. The authors of the report admit that they may have underestimated the total number of jobs lost due to U.S. sugar policy which has remained largely the same since the 1990s. Jusko (2002) and Napolitano (2004) further discuss plants that have closed operations or relocated across international borders to take

advantage of sugar policy and international trade agreements. Despite these reports, apparent domestic production of confectionery products has increased in the U.S. over the past five years despite an increase in imports as illustrated in the Census Bureau's *Current Industrial Reports* (various issues).

The combination of a protectionist U.S. sugar program through its use of marketing allotments and loan rates in conjunction with NAFTA has not caused the confectionery industry to abandon the U.S. given the total number of confectionery establishments was over sixteen hundred in 2005 (Census Bureau 2008). However since the confectionery industry is labeled footloose, confectionery manufacturers could be taking advantage of location opportunities that did not exist prior to the adoption and implementation of NAFTA and continuation of the U.S. sugar program. Hanson (1998) states that "as NAFTA consolidates the process of USA-Mexico economic integration it is likely to contribute to further relocation of US production towards US cities on the Mexican border."

This paper uses a location model to analyze location decision in the confectionery industry using county level data from 1993 to 2005. This time frame allows for changes in location to become evident due to the long-term nature of plant investment decisions. The Census Bureau's County Business Pattern data are used which allows for analysis of segments of the confectionery industry including chocolate and non-chocolate confectionery products. Similarly, the relatively unchanged nature of sugar policy in the U.S. will allow results to be compared to previous studies (Goetz 1997; Henderson and McNamara 1997, 2000) of the confectionery industry. Traditional factors that attract footloose industries as outlined in Goetz (1997) and Henderson and McNamara (2000)

have likely not changed, though access to infrastructure and proximity to other food manufacturers may have grown in importance as a result of the implementation of NAFTA. The fact that a U.S. county shares a border with Canada or Mexico may impact location decisions, not due to transportation costs, but in response to protectionist policies that require goods produced in the domestic market (specifically Mexico or the U.S.) to be produced across the border using cheaper sugar only to be shipped back across that border for distribution. This would suggest that transportation costs are a relatively inconsequential part of the final value of the confectionery product.

Literature Review

Market Forces

While protection of U.S. sugar growing and harvesting industry began shortly after the Revolutionary War, the Jones-Costigan Act of 1934 establishes the framework for U.S. policy that is still in effect today. Major policy provisions of this act include:

> (1) an annual determination of U.S. domestic requirements for sugar; (2) the division of the U.S. sugar market among domestic and foreign suppliers via the use of quotas; (3) the allotment of quotas among processors of sugar in domestic areas (i.e. marketing allotments); and (4) the adjustment of cane and beet production in each area to the established quotas (i.e. acreage allotments), (U.S. International Trade Commission 2001).

This act remained in place until 1974 when high sugar prices led to the abandonment of price support programs that were reinstated in 1977 (U.S. International Trade Commission 2001; Alvarez and Polopolus 2002). The price support programs were reinstituted due to low commodity prices and increased costs of production, processing, and marketing (Alvarez and Polopolus 2002). International trade agreements that the

U.S. has entered into has led to some minor changes specifically dealing with a minimum import quota, design of a new re-export program and whether or not loans are recourse or non-recourse depending on import levels as outlined in Alvarez and Polopolus (2002).

The current policy guarantees a raw sugar loan rate of 18 cents per pound of sugar for sugar cane producers and 22.9 cents per pound of sugar for sugar beet producers. The loan rates are two to three times the world price for raw sugar (see Figure 2). Similarly, the price of refined sugar in the U.S. Midwest markets is approximately two times the world refined price (see Figure 3). Concerns over the competitiveness of U.S. confectionery manufacturers' ability to remain competitive in export markets led to the establishment of the Sugar Containing Products Re-Export Program (SCPREP) in 1984. SCPREP allows for world-priced sugar imports to be used in the production of goods that are destined for export markets. However, products bound for the U.S. market must contain domestic sugar.

Like the U.S., Mexican sugarcane production is highly regulated and producers in Mexico receive a price for sugar that is approximately two and one-half times the world price for raw sugar. Canada is the only North American market that does not have protectionist policies for sugar beet producers and has no import restrictions on raw sugar and has minimal duties on refined sugar. Like the U.S., the Mexican programs of Temporary Importation for Producing Articles of Exportation (PITEX) and *Maquila* act in a similar fashion to the U.S. SCPREP. These two programs allow for manufacturers to temporarily import inputs that are used in the manufacturing process only to be shipped out as a component of the final manufactured product. The Mexican programs allow for confectionery manufacturers to benefit from savings in labor, energy, and sugar costs that

Mexico can offer to firms relative to the U.S. A breakdown of the cost savings among firms operating in Canada, Mexico, and the U.S. can be found in Peter Buzzanell and Associates (2003). Mexican labor costs were 3% of U.S. costs ($0.56/hr to $14.04/hr) with additional substantial savings in land, electricity, taxes and health care (Peter Buzzanell and Associates 2003). Peter Buzzanell and Associates (2003) illustrate costs between the U.S. and Canada are not as drastic as the differences between the U.S. and Mexico, but Canada does have an advantage except in terms electricity demand. Refined sugar users in Mexico are able to take advantage of the *Maquila* program which saved manufacturers approximately ten cents according to Peter Buzzanell and Associates (2003).

With transport costs being relatively unimportant for footloose firms, Alonso (1972) states that one of the three mechanisms that can make these types of firms even more footloose is a decline in the relative prices of transported inputs. A reduction in input prices are a result of the signing of NAFTA as Mexico is granted a declining tariff schedule for sugar through 2008 when these rates would become zero and there is no longer a limit on the amount of sugar that can be exported to the U.S. While the reduction in cost of sugar because of reduced tariff rates augments other sources of comparative advantage Mexico has (primarily labor and energy costs), the reduced cost of Mexican sugar may be sufficient to spark relocation plans among confectionery manufacturers in the U.S.

The attraction of food manufacturing firms is often a goal of counties seeking to attract economic development, often to rural areas (Capps, Fuller, and Nichols 1998; Salin, Atkins, and Salame 2002). Choices' regarding firm location in a county for food

and nonfood manufacturers would not necessarily be influenced by different factors (Goetz 1997) since profit maximization is ultimately the goal of any firm. There is a distinction between types of food manufacturing firms, however. Connor and Schiek (1997) divide the food manufacturing sector into one of three types depending on their cost structure: demand-oriented, supply-oriented, or footloose firms. Footloose firms do not use inputs that are perishable or expensive to transport as found in supply-oriented industries nor do they tend to locate near consumer markets which is common if transport costs comprise a large percentage of total costs as with demand-oriented firms (Connor and Schiek 1997). Henderson and McNamara (2000) note that access to labor, capital, business services, and transportation routes are important factors for footloose firms' location decisions. These facts help explain in part why confectionery manufacturers are located in areas such as Chicago and portions of Pennsylvania due to the competitive advantage these locations gave firms. Firms in these locations are able to take advantage of access to major transportation routes as well as having proximity to major markets' population concentrations in the eastern U.S.

Henderson and McNamara (1997, 2000) and Goetz (1997) study the factors that attract and retain food manufacturing firms in the U.S. Results differ in these three studies due to the objectives in each and the variables used in their respective modeling efforts (Henderson and McNamara focus on the Corn Belt, Goetz on the U.S.). Population (Goetz 1999; Henderson and McNamara 1997), infrastructure (Goetz 1997; Henderson and McNamara 2000), wage (Goetz 1997; Henderson and McNamara 2000), and agglomeration factors (Henderson and McNamara 1997, 2000) are significant at least at the ten percent level in these studies.

Locations of confectionery manufacturers in 1993 and 2005 are shown in Figures 4 and 5 with the net change between those years in confectionery manufacturers being shown in Figure 6. Figure 4 is reflective of the Standard Industrial Classification (SIC) codes for chocolate confectionery (2066) and non-chocolate confectionery (2064). Figure 5 is reflective of the North American Industrial Classification System (NAICS) codes for the confectionery industry, chocolate confectionery (31132), purchased chocolate (31133), and non-chocolate confectionery (31134). Implementation of NAFTA has led to the adoption of the NAICS codes for confectionery and the abandonment of the Standard Industrial Classification (SIC) codes allowing direct comparisons among data originating in Canada, Mexico, and the U.S. The chocolate confectionery code (31132 and 2066) is directly comparable across the time period studied in this paper. The non-chocolate (31134) and purchased chocolate codes (31133) are derived from the SIC code 2064, but the NAICS values are within three percent of the SIC values.

Methodology

Industrial location decisions are often viewed as a two-stage process with each stage being independent of each other (Goetz 1997; Henderson and McNamara 1997, 2000; Blair and Premus 1987; and Woodward 1992). The initial step is to select regions for consideration and the second step is to select certain areas for consideration in the final location decision. The first stage sees regions selected that will help the firm achieve its investment criteria including proximity to "raw materials, entrance into product markets, or increase market share" (Henderson and McNamara 2000).

Once those regions have been selected, the second phase of the decision process occurs. Much effort has focused on the factors affecting the decisions that attract manufacturing firms to a given location (whether food or non-food). The industrial location literature suggests that the results of final location decisions are described by the following equation:

(1) $EST_{ij} = f(\mathbf{M, L, I, A, F})$

where EST_{ij} is the number of establishments in county i in year j (confectionery establishments in this example), **M** is a vector of market factors, **L** is a vector of labor market characteristics, **I** is a vector associated with infrastructure in county i, **A** is a vector of agglomeration economies, and **F** is a vector of fiscal polices. The independent variables are included in analysis of location decisions regardless of whether the firm is supply or demand oriented or footloose, and would be necessary to ensure that a firm remains viable in a given county.

Approaches that are used in the location literature to determine the factors affecting firm location include 1) the net growth model (Goetz 1997; Henderson and McNamara 1997); 2) estimating the probability of location through a conditional logit (Woodward 1992; Levinson 1996); and 3) use of count data models (Henderson and McNamara 2000; List 2001). Count data models (i.e. Poisson) have been used in a variety of applications including the number of defects in a manufacturing process, recreational demand literature, as well as firm location. One advantage the count data models have over conditional logit models in firm location studies is the fact that each choice becomes an observation in a large data set as the independence of irrelevant attributes (IIA) is not a factor (Guimarães, Figueiredo, and Woodward 2004). Attempts

to model the location of confectionery manufacturers through use of a Poisson model proved unsuccessful.

The use of a Tobit model is not as common in the industrial location literature as methods mentioned in the previous paragraph. Use of a Tobit model has its own advantages, specifically the fact that many counties did not have a confectionery manufacturer locate within its borders over the study period. This essentially acts as a censored observation that can be corrected through estimation of a Tobit model (Barkley and Keith 1991). Additional advantages of this estimation method include its ability to handle a panel data set and random effects.

Data

Dependent variables

The number of confectionery manufacturers in a given county was obtained from the Census Bureau's County Business Population dataset from 1993 to 2005. This dataset includes the number of manufacturers by employment size and type of confectionery produced by SIC codes prior to 1997 and NAICS codes from 1998 to 2005. Information on amount of sales is not available. A panel data set is used with 3,079 counties in this dataset for the contiguous U.S. states plus the District of Columbia over the thirteen year period. The panel was unbalanced due to the creation of Broomfield County, Colorado in 2002 providing only four observations for this county. A total of 917 (29.7%) counties have at least one confectionery manufacturer in their borders during this time period. The majority of those counties average no more than one manufacturer (593 counties) operating during the thirteen year time period. A total of 13 counties average at least 10

confectionery manufacturers present. There is a difference in the way Virginia counties are recorded between the Bureau of Economic Analysis' Regional Economic Information System (BEA REIS) and the Census Bureau. The Census Bureau records all counties in Virginia as counties whereas BEA REIS adjusts several counties in Virginia to include metropolitan areas. In this study, all data for the state of Virginia are adjusted to be in compliance with BEA REIS data. An example of this would be that York County, Virginia accounts for not only that county but the city of Poquoson, Virginia, as well.

The NAICS codes for confectionery have replaced the Standard Industrial Classification (SIC) upon the implementation of NAFTA to allow direct comparisons among data originating in Canada, Mexico, and the U.S. The chocolate confectionery code (NAICS 31132 and SIC 2066) is directly comparable across the time period in this paper. The non-chocolate (NAICS 31134) and purchased chocolate codes (NAICS 31133) are derived from the SIC code 2064, but the NAICS values are only within three percent of the SIC values.

Independent Variables

The regressors chosen are consistent with the location literature which states that location decisions are based on market factors, labor market characteristics, infrastructure, agglomeration economies, and fiscal polices. Summary statistics, expected signs, and description of the regressors are provided in Table 1.

Access to markets. The market factors considered are the percentage of sugar produced in the county each year, the presence of a sugarcane or sugar beet refinery in the county, population, and per capita personal income. Total acreage of sugar production in a county is obtained from yearly Census of Agriculture estimates. Counties

whose production is aggregated by congressional district are assigned a percentage of the total crop in the district based on the proportion of total farm acres in the county and total farm acres in the district based on 2002 Census of Agriculture estimates. Production in each county was then divided by total state production for the year (*SUGARPCT)*.

While the confectionery industry is viewed as a footloose industry and is not directly tied to sources of raw materials such as sugar, this variable is included to determine if confectionery manufacturers are seeking areas that are close to areas of sugar production and are not as footloose as previously presumed. The presence of sugarcane or sugar beet refineries (*CANEREFINE* and *BEETREFINE*) from the Census Bureau's County Business Patterns dataset are also included in the vector of market related variables as their presence in a county would further allow confectionery manufacturers access to sugar needed for their production of various types of candies. Both of these variables were available on a yearly basis by county. An additional variable, *NAFTA*, was included to measure the impact of NAFTA on location decisions. The total amounts of confectionery imports from Canada and Mexico from 1993 to 2005 are from the U.S. International Trade Commission based on tariff codes from the U.S. Harmonized Tariff System that are listed in the annual U.S. Census Bureau's *Current Industrial Reports* for the confectionery industry. A three year moving average is calculated as firms would not base location decisions on import numbers from one year. Firms would likely analyze trends to determine whether or not maintaining a location in the current county would remain in line with the firm's objectives (including profit maximization or proximity to resources). This variable is scaled by taking the natural

logarithm of hundred of millions of kilograms to aid in the nonlinear optimization procedure.

County population (*POP*) from the BEA REIS was also included in the market vector of independent variables. Due to the County Business Patterns data including smaller confectionery manufacturers that likely produce candies for sale at their location, in addition to large multinational companies including Hershey's and M&M Mars, these manufacturers must have sufficiently large potential market to tap into to ensure their viability. This variable enters the model as the natural logarithm of population in thousands. An additional market variable included is personal per capita income (*INCOME*) from REIS. This variable is then deflated by the implicit price deflator for GDP. Income has been used to measure market demand and a proxy for quality of life in that county (Henderson and McNamara 1997, 2000). A market potential variable (Plaut and Pluta 1983; Goetz 1997) has been included in some studies to measure the access to markets, but studies where this variable is used to adjust for income and the value added by manufacturers in other markets (i.e. states).

Labor force factors. Labor characteristics are included to reflect the business climate in the states and counties. Some data such as unionization and high school education rates are only available at the state level on a yearly basis. Labor unionization (*UNION*) rates are obtained from Hirsch and Macpherson (2003) which are based on the Bureau of Labor Statistics publication, *Directory of National Unions and Employee Associations*. It is assumed that the unionization percentage in each county is the same as for the state. The percentage of persons over the age of 25 with a high school diploma (*HSED)* is included to reflect the skill set of potential employees in a selected county.

County level estimates for persons with at least a high school diploma are not available as this is reported only in census years. This led to the state high school education percentages being used as a proxy for county level observations. Both *UNION and HSED* are treated as decimals.

An additional labor market characteristic included is the unemployment percentage rate in each county. Unemployment percentages (*UNEMP)* were obtained from the Bureau of Labor Statistics' Local Area Unemployment Statistics. These annual averages are available for every county in the U.S. dating back to 1990 and were treated as decimals to aid in scaling of the model. The average hourly wage rate was not available for confectionery manufacturers from governmental sources, but manufacturing earnings (from REIS[2]) for each county were considered for use as a proxy variable. However, manufacturing earnings are not disclosed for many counties and when disclosed manufacturing earnings are highly correlated (0.84) with the food manufacturing variable (*FOODMFGS)*, this variable was not included.

Infrastructure. Many different variables have been used to measure the impact of infrastructure from port access to amount of road miles in a county (Henderson and McNamara 1997, 2000; Goetz 1997). Lack of availability of data such as county road miles on a yearly basis led to the use of only the presence of interstates (as a dummy variable) in regards to transportation networks. No new sections of interstate have been built since 1993 allowing no assumptions having to be made about the presence of interstates in a county from 1993 to 2005. A dummy variable is also included that indicates if the county shares a border with Canada or Mexico. Some counties in northern states including Michigan, Pennsylvania, and Wisconsin are included as border

[2] Values in REIS were in thousands (000s).

counties even if they did not have a land border with Canada due to access through either one of the Great Lakes or in the case of Maine, access to the Atlantic Ocean. However, southern states such as Alabama, Florida, and Louisiana are not included as they do not share a land border with Mexico and are not in close proximity to Mexico.

Agglomeration. Although footloose firms are not tied to specific areas of the country in an effort to minimize costs associated with acquisition of raw materials or distribution of finished products, these types of firms may still choose to locate near other food manufacturers. This would allow confectionery manufacturers to potentially reduce costs due to shared knowledge or a more skilled workforce due to the presence of other food manufacturers. While the presence of other food manufacturers may cause firms to raise the wage of its employees, firms would be spending less on training employees due to the skill set in newly hired employees. The variable, *FOODMFGS*, represents all other food manufacturers in a county. These numbers are based on the SIC code 20 which represents Food and Kindred Products for 1993-1997 and NAICS code 311 (Food Manufacturing). Additional dummy variables are included for regions of the country based on Census Bureau definitions. The Census Bureau divides the country into four sections: *Northeast, South, Midwest, and West*. Inclusion of these regional dummy variables allows for the detection of differences between the parts of the country that may not be detected elsewhere.

Fiscal Policy. Fiscal policies are included in the final vector in location study determinants, despite mixed results in terms of significance and direction. Previous studies including Henderson and McNamara (1997 and 2000) use fiscal policy variables from the Advisory Commission on Intergovernmental Relations (ACIR) including tax

capacity and tax effort. However, the ACIR has been closed in the late 1990s leading to no data from that time point forward being available. Other sources for data regarding fiscal policy are available, but only aggregated for all counties in a state. The Census of Government provides yearly fiscal data in terms of total collections from a wide variety of tax sources (i.e. corporate, alcohol, individual, motor vehicle, etc.) as well as total expenditures. Data is not available on a state by state basis for 2001 and 2003, leading to the use of linear interpolation in those instances. Two ratios are created to determine the effect, if any, that fiscal policies have on location decisions by confectionery manufacturers. The first ratio is the total property taxes collected by counties in a state divided by the total county level expenditures in that state. Each component of the ratio is deflated by the implicit price deflator for GDP before calculating the ratio. This ratio is similar to the one calculated by Goetz (1997) except the ratio Goetz (1997) used was not aggregated for all counties in a state. This is a result of data being available on a county level due to 1997 being a year the Census of Government occurred. The second ratio calculated was the deflated corporate tax collections in the state divided by the deflated state expenditures. This ratio relates how business friendly the state is in terms of corporate tax collections which are not available for all years in the study period.

Empirical Results

A total of six models are estimated. Two of these models are due to the sub-types of confectionery (purchased chocolate and non-chocolate), two models are based on industrial codes (SIC versus NAICS), one is based on employment level (less than 20 employees), and one pooled model for all types of confectionery across the time period of 1993 to 2005. An additional three models (chocolate confectionery, manufacturers

employing 20 to 99 employees and manufacturers employing at least 100 employees) are attempted but were inestimable due to the disturbance term in the Tobit model being negative. Employment size is classified in the above manner to try and maximize the number of establishments in each category, although the *County Business Patterns* data from Census Bureau has nine classifications (1 to 4 employees, 5 to 9 employees, 10 to 19 employees, 20-49 employees, 50-99 employees, 100 to 249 employees, 500 to 999 employees, and at least 1000 employees). The purchased chocolate model is estimated only for 1998 through 2005 as it is a new industrial code established with the implementation of NAICS. Empirical results are provided in Tables 3 through 8. These estimates are representative of the dependent variable after it has been transformed. However, the marginal effects and elasticities that are presented have been adjusted where interpretation is easier.

Initial estimation of models detects the presence of non-normality in the error term. Although estimating the model with the assumption the errors followed a Weibull, lognormal, or exponential distribution is a possibility, a square root transformation of the dependent variable resolves the non-normality issue in all but one instance. The square root transformation is consistent with the literature (Bartlett 1936; Anscombe 1948) which demonstrates the properties this transformation has on the variance. These papers are applied to the Poisson distribution which is useful to this application given the discrete and left censored (at zero) observations in the dependent variable. Non-normality is present in the non-chocolate model after the square root transformation. Normality tests are conducted at the one percent level which has a critical value of 9.21.

The non-chocolate model has a test statistic of 10.54. Estimates for that model should be considered inefficient.

Due to the measurable difference in confectionery codes in the two classification regimes, models for all confectionery types under the SIC, NAICS, and aggregated across the thirteen years studied were estimated. A likelihood ratio test is employed to determine the suitability of aggregating the results. The critical value for eighteen degrees of freedom is 28.87 which was less than the test statistic of 10,479.404 leading to the rejection of the null hypothesis that parameters and variances are equal across the classification systems. Estimation results suggest that NAFTA did have the expected negative influence on confectionery location decisions. Availability of data prior to 1993 may lead to an even stronger conclusion regarding NAFTA. Further evidence to support this claim is present in Haley (2003) who states that more sugar enters the U.S. through confectionery products than is explicitly agreed to in NAFTA's provisions regarding raw and refined sugar.

Presence of sugar cane or sugar beet refiners has an unexpectedly negative impact on the presence of confectionery manufacturers regardless of classification system. This suggests that U.S. confectionery manufacturers are still footloose in nature as described in Henderson and McNamara (1997) and Connor and Schiek (1997). The same fact holds true in regards to the fact that confectionery manufacturers are not drawn to counties where sugar production occurred. Population is a positive factor in attracting confectionery manufacturers across the study period. Income is only significant under NAICS with the implication that confectionery manufacturers are drawn to larger population centers rather than areas with higher incomes. The fact that population is

more important than income is not surprising given the relatively inexpensive nature of confectionery products as well as the market may contain more than one county.

Counties with higher unemployment rates are unattractive to confectionery manufacturers from 1998 forward suggesting the available labor did not have the right skill set. It is possible that this variable is signifying that confectionery manufacturers stay away from counties with higher levels of unemployment due to a lack of market for their products. This fact can be contrasted with the fact that agglomeration forces (specifically the number of other food manufacturers in a county) are a positive influence on the attraction of confectionery manufacturers. This is consistent with the finding that confectionery manufacturers tend to locate in high population centers. Further justification for this is the significant differences in the three regions included in the model relative to the northeast U.S. (the omitted region). The northeastern region of the U.S. is geographically close to many major markets even outside of its region. Furthermore, transportation costs may be low relative to the value of the product to remain in the northeastern portion of the U.S. It was surprising that the western region of the U.S. had a change in sign due to the change from SIC system to NAICS system. This fact may be due to the reclassification of confectionery manufacturers that ignores many manufacturers in the western portion of the U.S. under the SIC system who produced and sold confectionery for consumption at the location. The fact that the ratio of property taxes relative to general direct expenditures (*PROPEXP*) has an unexpected positive value may be a result of the fact that the northeast was used as the reference category while *CORPEXP* has the expected sign under both classification regimes. It is also

surprising that *PROPEXP* had a change in significance from the SIC to the NAICS system.

One of the more surprising findings in comparing the classification regimes is the switching of the sign for level of high school education between SIC and NAICS. No changes in assumptions of this paper are made between the two systems suggesting that lower levels of education are suddenly preferred by confectionery manufacturers due to NAFTA in terms of a suitable workforce. This result could be due to the use of state average level of persons over the age of 25 with a high school diploma instead of county level data which is unavailable annually. Similar to the result regarding high school education is the fact that the presence of unionized labor became negative between the SIC and NAICS regimes. The increased access given to Canadian and Mexican confectionery manufacturers could have led manufacturers to seek areas where unionized labor is less prevalent to help firms remain competitive against competition from Canada and Mexico. This fact could also be a result of the use of state level data as a proxy for county level data.

Counties with a border are significantly negative in terms of attracting confectionery manufacturers under the SIC regime but become attractive under the NAICS. This may be a result of including areas that have water access to Canada through the Great Lakes as opposed to counties that only have land borders as well as omitted manufacturers under the SIC system being counted under NAICS. Border counties may also have a larger, more diverse population to serve due to differences in taste and preferences, specifically along the southern border of the U.S. The fact that interstate highway access is not significant under the SIC and NAICS regime is

interesting to note suggesting that transport costs are low enough that access to the interstate is not a necessary condition to have a confectionery manufacturer in a county.

Results were generally consistent across types of confectionery as well as with aggregated models for the industrial classification systems despite varying levels of significance. The fact that there is at least a three percent difference in SIC 2064 and NAICS 31134 may lead to biased results that are exhibited in some of the modeling efforts, especially the employment model relative to the SIC and NAICS regime models. The variable, *PROPEXP*, was another variable that had differing signs across the types of confectionery. *PROPEXP* was positive in the non-chocolate sub-type which was only available for 1998 to 2005 which could be a result of the sub-type available for only eight of the thirteen years in the study period.

Manufacturers (regardless of type of confectionery product) who employed less than 20 employees were positively affected by NAFTA. It is possible that NAFTA created opportunities for smaller manufacturers that were not present prior to the implementation of NAFTA. These employers also tended to locate in areas with a higher ratio of property taxes to direct general expenditures. Employers in this subset also sought out areas with higher populations to develop a potential niche as well as higher income areas in an effort to capture some of the customer's disposable income. The presence of other food manufacturing facilities was positively associated with manufacturers employing less than 20 persons although access to an interstate was not significant suggesting that these manufacturers have a specific niche they are trying to fulfill. This is one of the few estimated models where there was a significant positive effect between the northeastern and western portions of the U.S. While it is possible that

these areas have similar tastes and preferences to each other in terms of confectionery products, it is also a possibility that firms have sufficient (consumer and labor) markets to exploit that are lacking in the south and Midwest.

Estimated marginal effects and elasticities are also presented in Tables 2 through 10. As previously mentioned, these effects have been transformed so that the interpretation is easy. Marginal effects are calculated by the equation

$$(2) \qquad \frac{\partial E(y)}{\partial x_i} = 2\beta_i (X'B)^2 \gamma$$

where γ is the scale factor for the marginal effects provided by LIMDEP while elasticities are estimated by the equation

$$(3) \qquad \frac{\partial E(y)}{\partial x_i} \frac{x_i}{E(y)} = 2x_i \beta_i \frac{X'\beta}{\overline{Y}} \gamma$$

where $\overline{Y}$ is the mean for all observations (i.e. zero and non-zero). Due to taking the natural logarithm of population and confectionery imports, equation three is modified to

$$(4) \qquad \frac{\partial E(y)}{\partial x_i} \frac{x_i}{E(y)} = 2x_i \beta_i \frac{\beta_i}{\overline{Y}} \gamma$$

with the definitions remaining the same as equation (2). Marginal effects and elasticities are calculated at the means for continuous variables only. The elasticities suggest that NAFTA is more important during the SIC regime than the NAICS regime leading to the conclusion that firms most likely to take advantage of reduced confectionery tariff rates left early in the period. Increased population is also likely to lead to the formation of confectionery establishments suggesting that confectionery may be seen as a luxury good in larger cities providing the opportunity for smaller, custom confectionery manufacturers.

Conclusions

The implementation of the North American Free Trade Agreement (NAFTA) does have an effect on the location decisions of confectionery manufacturers in the U.S. Unlimited access of confectionery goods produced in Canada and Mexico with sugar obtained at the world price creates a competitive advantage for firms that locate in those countries. U.S. sugar policy works against domestic confectionery manufacturers who must use domestically produced sugar in their goods that are bound for the U.S. market.

The estimated impact of NAFTA's implementation on location decisions in the U.S. was typically small, but significantly different from zero in the estimated elasticities under the SIC and NAICS code regimes. More important factors such as population, income, and presence of other food manufacturing facilities are generally more important factors in the location decision. However, the implementation of NAFTA and its low duties on confectionery products may have led to the decision to abandon existing facilities that are in need of repair when it would have been cheaper to move to Mexico and Canada to take advantages of cost savings outlined in Peter Buzzanell and Associates (2003). Additional support for the limited factor NAFTA may have had on decisions is borne out by the relatively small amount of sugar in a piece of candy. Many popular types of confectionery such as M&M's, Nestle Crunch candy bars, and Nestle Baby Ruth candy bars have less than three cents of sugar in each product (American Sugar Alliance 2007).

Some of the estimated results in this paper are not as expected with some of this likely as a result of using state level data as a proxy for county level data. This could be a poor proxy in many cases, especially in terms of union labor, high school education, and the ratio of government tax collections (property or corporate) to direct general expenditures. The fact that modeling efforts are generally consistent across different classification systems (SIC versus NAICS) as well as sub-types of confectionery products and level of employment suggests that confectionery manufacturers are affected in the same manner by factors.

Another limitation of this research is that county level observations are only available for the U.S. Availability of data from Mexico or Canada prevents testing of whether NAFTA made locations in Canada and Mexico more attractive than potential locations in the U.S. Annual available data from the state or provincial level in the other NAFTA countries could have give more credence to the findings contained in this paper. Cost savings in Peter Buzzanell and Associates (2003) illustrate the potential to increase profits by relocating confectionery facilities outside the U.S. Steps to address this disparity could lead to additional relocations in the confectionery industry given its footloose nature to other parts of the world such as Latin America, Argentina, or Brazil (Peter Buzzanell and Associates 2003). This is a plausible scenario given the relatively inexpensive nature of shipping confectionery. In short, U.S. sugar policy and NAFTA has created a classic cross-hauling example.

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Table I-1. Definitions and Summary Statistics for Regressors

Variable	Description	Mean	Standard Deviation	Expected Sign
SUGARPCT[a]	Percentage of sugar grown in a county	0.005	0.036	(-)
CANEREFINE[b]	Number of sugarcane refineries	0.006	0.088	(+)
BEETREFINE[b]	Number of sugar beet refineries	0.012	0.118	(+)
POP[c]	Natural logarithm of population (in thousands)	3.323	1.409	(+)
INCOME[c]	Per capita personal income (in thousands)	0.220	0.055	(+)
UNION[d,h]	Unionization rate (expressed as decimal)	0.115	0.056	(-)
HSED[e,h]	High school graduation rates of persons 25 and over (as decimal)	0.832	0.048	(+)
UNEMP[c]	Unemployment rate (expressed as decimal)	0.056	0.026	(-)
HWY[f]	Interstate highway (DV = 1 if highway crosses county)	0.443	0.497	(+)
BORDER[f]	County borders Canada or Mexico (DV = 1 if true)	0.051	0.220	(+)
FOODMFGS[b]	All other food manufacturers in the county (in hundreds)	0.074	0.266	(+)
NORTHEAST	County in Northeast	0.070	0.256	
SOUTH	County in the South	0.453	0.498	(-)
MIDWEST	County in the Midwest	0.357	0.479	(+)
WEST	County in the West	0.120	0.325	(+)
PROPEXP[g,i]	Property tax per general direct expenditures	0.246	0.081	(-)
CORPEXP[g,h,i]	Corporate tax per general direct expenditures	0.025	0.023	(-)
NAFTA[j]	Natural logarithm of hundreds of million of kilograms of confectionery imports	5.048	0.878	(-)

[a] Census of Agriculture yearly estimates
[b] Census Bureau's County Business Patterns
[c] Bureau of Economic Analysis Regional Economic Information System (REIS)
[d] Hirsch and Macpherson (2003)
[e] Census Bureau County Population Survey
[f] ESRI GIS Tiger File
[g] Census of Government
[h] Measured at state level
[i] Deflated by the implicit price GDP deflator
[j] Calculated as a three year moving average, U.S. International Trade Commission

Table I-2. Correlation Matrix for Independent and Dependent Variables

	CANDY	*SUGARPCT*	*CANEREFINE*	*BEETREFINE*	*POP*	*INCOME*	*UNION*	*HSED*	*UNEMP*
CANDY	1.000								
SUGARPCT	0.005	1.000							
CANEREFINE	0.152	0.074	1.000						
BEETREFINE	0.045	0.451	-0.004	1.000					
POP	0.444	0.045	0.106	0.057	1.000				
INCOME	0.335	0.009	0.061	0.013	0.438	1.000			
UNION	0.166	0.026	0.031	0.062	0.227	0.163	1.000		
HSED	0.050	0.063	-0.027	0.056	-0.079	0.307	0.278	1.000	
UNEMP	-0.040	0.064	0.017	0.037	-0.005	-0.387	0.074	-0.292	1.000
HWY	0.200	0.030	0.038	0.035	0.474	0.261	0.103	-0.011	-0.097
BORDER	0.082	0.071	-0.011	0.075	0.054	0.002	0.228	0.097	0.134
FOODMFGS	0.821	0.032	0.203	0.061	0.459	0.298	0.158	0.027	-0.016
NORTHEAST	0.212	-0.035	0.056	-0.017	0.277	0.232	0.372	0.076	-0.017
SOUTH	-0.048	0.005	-0.040	0.036	-0.166	0.068	0.361	0.507	-0.216
MIDWEST	-0.121	-0.062	0.017	-0.084	0.020	-0.224	-0.623	-0.695	0.140
WEST	0.088	0.115	-0.011	0.090	-0.004	0.060	0.128	0.258	0.118
PROPEXP	0.048	-0.010	-0.011	-0.008	-0.008	0.211	0.147	0.281	-0.180
CORPEXP	0.063	-0.010	0.023	0.025	0.148	0.078	0.328	0.015	0.013
NAFTA	0.058	-0.001	-0.002	-0.006	0.018	0.291	-0.172	0.387	-0.125

Table I-2..Cont.

	HWY	*BORDER*	*FOODMFGS*	*NORTHEAST*	*SOUTH*	*MIDWEST*	*WEST*	*PROPEXP*	*CORPEXP*	*NAFTA*
HWY	1.000									
BORDER	0.004	1.000								
FOODMFGS	0.194	0.066	1.000							
NORTHEAST	0.158	0.109	0.155	1.000						
SOUTH	-0.081	0.095	-0.045	-0.205	1.000					
MIDWEST	-0.029	-0.166	-0.103	-0.250	-0.678	1.000				
WEST	0.039	0.028	0.102	-0.102	-0.336	-0.275	1.000			
PROPEXP	0.046	0.115	0.028	0.344	-0.360	0.305	-0.168	1.000		
CORPEXP	0.074	0.099	0.064	0.188	-0.186	0.138	-0.067	0.025	1.000	
NAFTA	0.000	0.000	0.024	0.000	0.000	0.000	0.000	-0.076	-0.167	1.000

Table I-3. Empirical estimates, marginal effects, and elasticities of the determinants of aggregated confectionery manufacturers' location

Variable	Parameter Estimate	Standard Error	Marginal Effect	Elasticity
Intercept	-3.838***	0.179		
SUGARPCT	-0.329**	0.143	-0.215	-0.001
CANEREFINE	0.110***	0.037	0.072	0.000
BEETREFINE	-0.150***	0.057	-0.098	-0.001
POP	0.731***	0.009	0.478	0.672
INCOME	2.397***	0.126	1.567	0.400
UNION	0.569***	0.140	0.372	0.049
HSED	-1.765***	0.210	-1.153	-1.111
UNEMP	-4.246***	0.353	-2.775	-0.180
HWY	0.030**	0.012	---[a]	---[a]
BORDER	0.306***	0.020	---[a]	---[a]
FOODMFGS	0.483***	0.012	0.315	0.027
SOUTH	-0.749***	0.026	---[a]	---[a]
MIDWEST	-0.284***	0.016	---[a]	---[a]
WEST	0.065***	0.024	---[a]	---[a]
PROPEXP	0.760***	0.078	0.497	0.142
CORPEXP	-1.265***	0.207	-0.827	-0.024
NAFTA	0.178***	0.011	0.116	0.060
σ	1.324***	0.011		
α	0.175***	0.004		
Log likelihood	-16550.620			
Pseudo-R^2	0.167			

Note: σ denotes the disturbance parameter associated with a Tobit model and α denotes the random effect associated with the i^{th} county.
Marginal effects estimated at the sample mean of the independent variable.
*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.
[a] Marginal effects and elasticities not calculated for dummy variables.

Table I-4. Empirical estimates, marginal effects, and elasticities of the determinants of SIC confectionery manufacturers' location

Variable	Parameter Estimate	Standard Error	Marginal Effect	Elasticity
Intercept	-3.784***	0.297		
SUGARPCT	-1.623***	0.372	-0.001	0.000
CANEREFINE	0.063	0.071	0.000	0.000
BEETREFINE	0.125**	0.065	0.000	0.000
POP	0.617***	0.014	0.000	0.001
INCOME	1.978***	0.197	0.002	0.001
UNION	2.290***	0.251	0.002	0.000
HSED	0.648*	0.333	0.001	0.001
UNEMP	-3.111***	0.460	-0.002	0.000
HWY	0.022	0.025	---[a]	---[a]
BORDER	-0.136***	0.038	---[a]	---[a]
FOODMFGS	1.225***	0.041	0.001	0.000
SOUTH	-0.573***	0.050	---[a]	---[a]
MIDWEST	-0.135***	0.032	---[a]	---[a]
WEST	-0.272***	0.045	---[a]	---[a]
PROPEXP	-0.041	0.128	0.000	0.000
CORPEXP	-8.249***	0.682	-0.006	0.000
NAFTA	-0.138***	0.028	0.000	0.000
σ	0.470***	0.005		
α	1.015***	0.015		
Log likelihood	-3452.679			
Pseudo-R^2	0.439			

Note: σ denotes the disturbance parameter associated with a Tobit model and α denotes the random effect associated with the i^{th} county.
Marginal effects estimated at the sample mean of the independent variable.
*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.
[a] Marginal effects and elasticities not calculated for dummy variables.

Table I-5. Empirical estimates and marginal effects of the determinants of NAICS confectionery manufacturers' location

Variable	Parameter Estimate	Standard Error	Marginal Effect	Elasticity
Intercept	-3.352***	0.195		
SUGARPCT	-0.566***	0.164	-0.065	0.000
CANEREFINE	0.038	0.058	0.004	0.000
BEETREFINE	-0.286***	0.050	-0.033	0.000
POP	0.837***	0.009	0.096	0.111
INCOME	1.575***	0.129	0.181	0.037
UNION	-0.781***	0.174	-0.090	-0.009
HSED	-0.594***	0.222	-0.068	-0.051
UNEMP	-2.253***	0.396	-0.259	-0.012
HWY	0.013	0.015	---[a]	---[a]
BORDER	0.139***	0.022	---[a]	---[a]
FOODMFGS	0.308***	0.022	0.035	0.002
SOUTH	-0.690***	0.031	---[a]	---[a]
MIDWEST	-0.166***	0.020	---[a]	---[a]
WEST	0.083***	0.027	---[a]	---[a]
PROPEXP	2.203***	0.087	0.002	0.054
CORPEXP	-1.740***	0.276	-0.200	-0.004
NAFTA	-0.082***	0.012	-0.009	0.002
σ				
α				
Log likelihood	-7858.239			
Pseudo-R^2	0.420			

Note: σ denotes the disturbance parameter associated with a Tobit model and α denotes the random effect associated with the i^{th} county.
Marginal effects estimated at the sample mean of the independent variable.
*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.
[a] Marginal effects and elasticities not calculated for dummy variables.

Table I-6. Empirical estimates, marginal effects, and elasticities of the determinants of non-chocolate confectionery manufacturers' location

Variable	Parameter Estimate	Standard Error	Marginal Effect	Elasticity
Intercept	-3.107***	0.230		
SUGARPCT	-0.676***	0.170	-0.022	-0.001
CANEREFINE	-0.148***	0.054	-0.005	0.000
BEETREFINE	0.032	0.059	0.001	0.000
POP	0.720***	0.015	0.024	0.721
INCOME	1.378***	0.160	0.046	0.080
UNION	0.863***	0.188	0.029	0.026
HSED	-0.894***	0.273	-0.030	-0.195
UNEMP	-3.839***	0.448	-0.128	-0.056
HWY	0.045***	0.017	---[a]	---[a]
BORDER	-0.050*	0.029	---[a]	---[a]
FOODMFGS	0.429***	0.016	0.014	0.008
SOUTH	-0.472***	0.034	---[a]	---[a]
MIDWEST	-0.195***	0.023	---[a]	---[a]
WEST	0.086***	0.033	---[a]	---[a]
PROPEXP	0.448***	0.102	0.015	0.029
CORPEXP	-5.489***	0.580	-0.183	-0.036
NAFTA	-0.189***	0.013	-0.006	0.075
σ	1.439***	0.020		
α	0.173***	0.007		
Log likelihood	-11856.530			
Pseudo-R^2	0.175			

Note: σ denotes the disturbance parameter associated with a Tobit model and α denotes the random effect associated with the i^{th} county.
Marginal effects estimated at the sample mean of the independent variable.
*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.
[a] Marginal effects and elasticities not calculated for dummy variables.

Table I-7. Empirical estimates, marginal effects, and elasticities of the determinants of purchased chocolate confectionery manufacturers' location

Variable	Parameter Estimate	Standard Error	Marginal Effect	Elasticity
Intercept	-4.659***	0.296		
SUGARPCT	0.288	0.339	0.004	0.000
CANEREFINE	-0.309***	0.086	-0.004	0.000
BEETREFINE	-0.353***	0.067	-0.004	0.000
POP	0.876***	0.014	0.011	0.016
INCOME	1.616***	0.197	0.020	0.006
UNION	-1.882***	0.255	-0.024	-0.003
HSED	1.061***	0.335	0.013	0.015
UNEMP	0.411	0.561	0.005	0.000
HWY	-0.227***	0.024	---[a]	---[a]
BORDER	0.686***	0.038	---[a]	---[a]
FOODMFGS	0.105***	0.017	0.001	0.000
SOUTH	-0.892***	0.046	---[a]	---[a]
MIDWEST	-0.394***	0.029	---[a]	---[a]
WEST	-0.410***	0.038	---[a]	---[a]
PROPEXP	-0.821***	0.121	-0.010	-0.003
CORPEXP	-1.515***	0.356	-0.019	-0.001
NAFTA	-0.084***	0.016	-0.001	0.000
σ	0.643***	0.004		
α	1.120***	0.014		
Log likelihood	-6558.749			
Pseudo-R^2	0.362			

Note: σ denotes the disturbance parameter associated with a Tobit model and α denotes the random effect associated with the i^{th} county.
Marginal effects estimated at the sample mean of the independent variable.
*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.
[a] Marginal effects and elasticities not calculated for dummy variables.

Table I-8. Empirical estimates and marginal effects of the determinants of confectionery manufacturers' location that employ less than 20 persons

Variable	Parameter Estimate	Standard Error	Marginal Effect	Elasticity
Intercept	-5.082***	0.200		
SUGARPCT	0.331**	0.158	0.396	0.002
CANEREFINE	-0.063	0.056	-0.076	0.000
BEETREFINE	-0.123**	0.058	-0.147	-0.002
POP	0.684***	0.010	0.820	0.643
INCOME	2.905***	0.143	3.481	0.800
UNION	1.174***	0.158	1.407	0.168
HSED	-1.190***	0.228	-1.426	-1.237
UNEMP	-4.322***	0.403	-5.179	-0.302
HWY	0.001	0.013	---[a]	---[a]
BORDER	0.312***	0.022	---[a]	---[a]
FOODMFGS	0.378***	0.019	0.452	0.035
SOUTH	-0.574***	0.029	---[a]	---[a]
MIDWEST	-0.283***	0.019	---[a]	---[a]
WEST	0.195***	0.026	---[a]	---[a]
PROPEXP	0.953***	0.084	1.142	0.293
CORPEXP	-1.317***	0.185	-1.578	-0.042
NAFTA	0.257***	0.012	0.308	0.138
σ	1.367***	0.013		
α	0.170***	0.006		
Log likelihood	-14951.470			
Pseudo-R^2	0.155			

Note: σ denotes the disturbance parameter associated with a Tobit model and α denotes the random effect associated with the i^{th} county.
Marginal effects estimated at the sample mean of the independent variable.
*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.
[a] Marginal effects and elasticities not calculated for dummy variables.

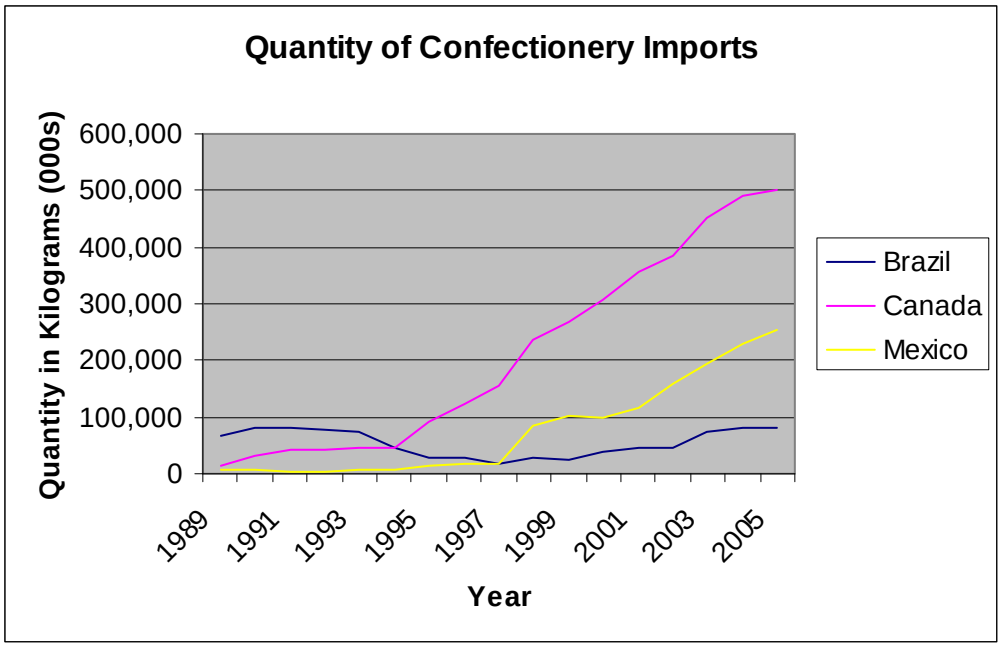

Figure I-1. Quantity of Confectionery Imports
Source: U.S. International Trade Commission.

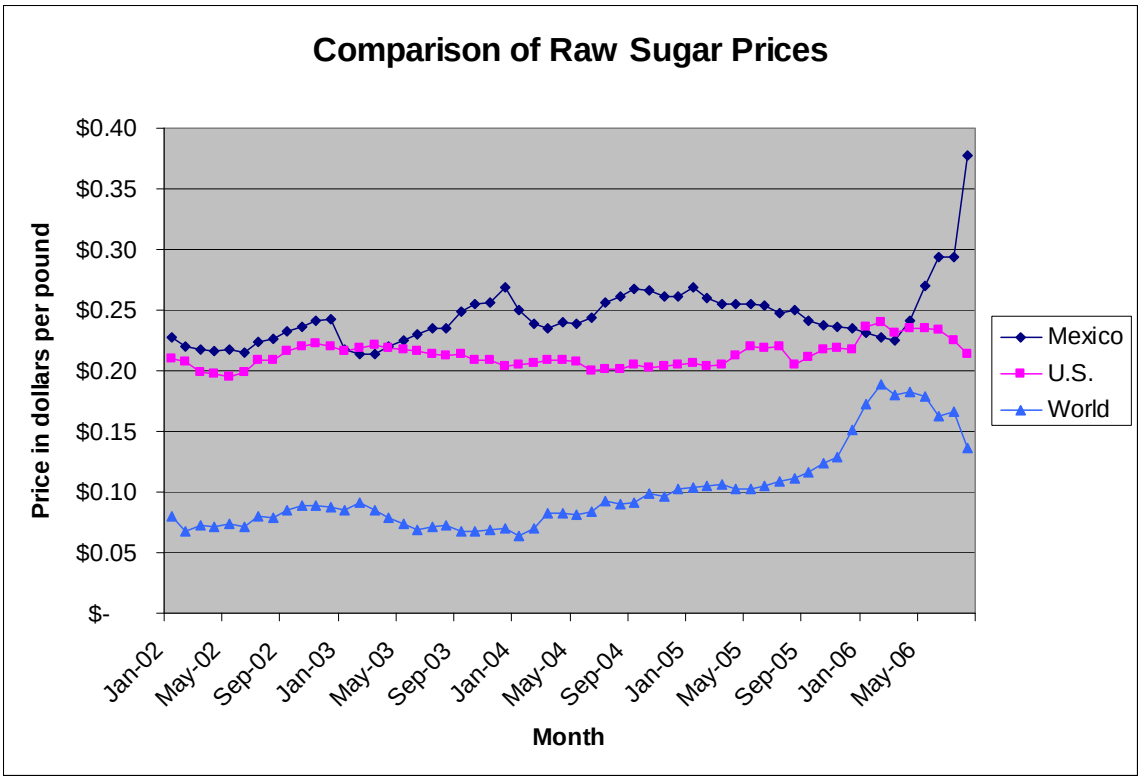

Figure I-2. Comparison of Raw Sugar Prices
Sources: Flores (2006); Flores (2005); Flores and Hernandez (2003); USDA ERS.

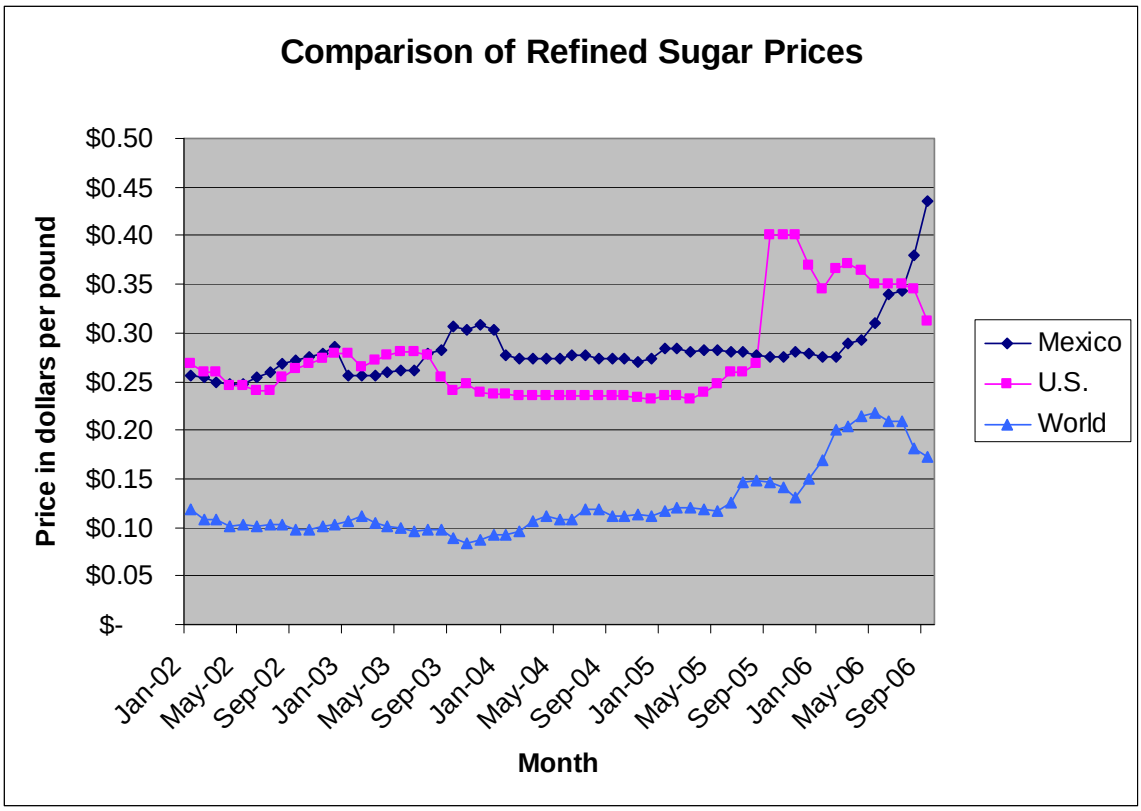

Figure I-3. Comparison of Refined Sugar Prices
Sources: Flores (2006); Flores (2005); Flores and Hernandez (2003); USDA ERS

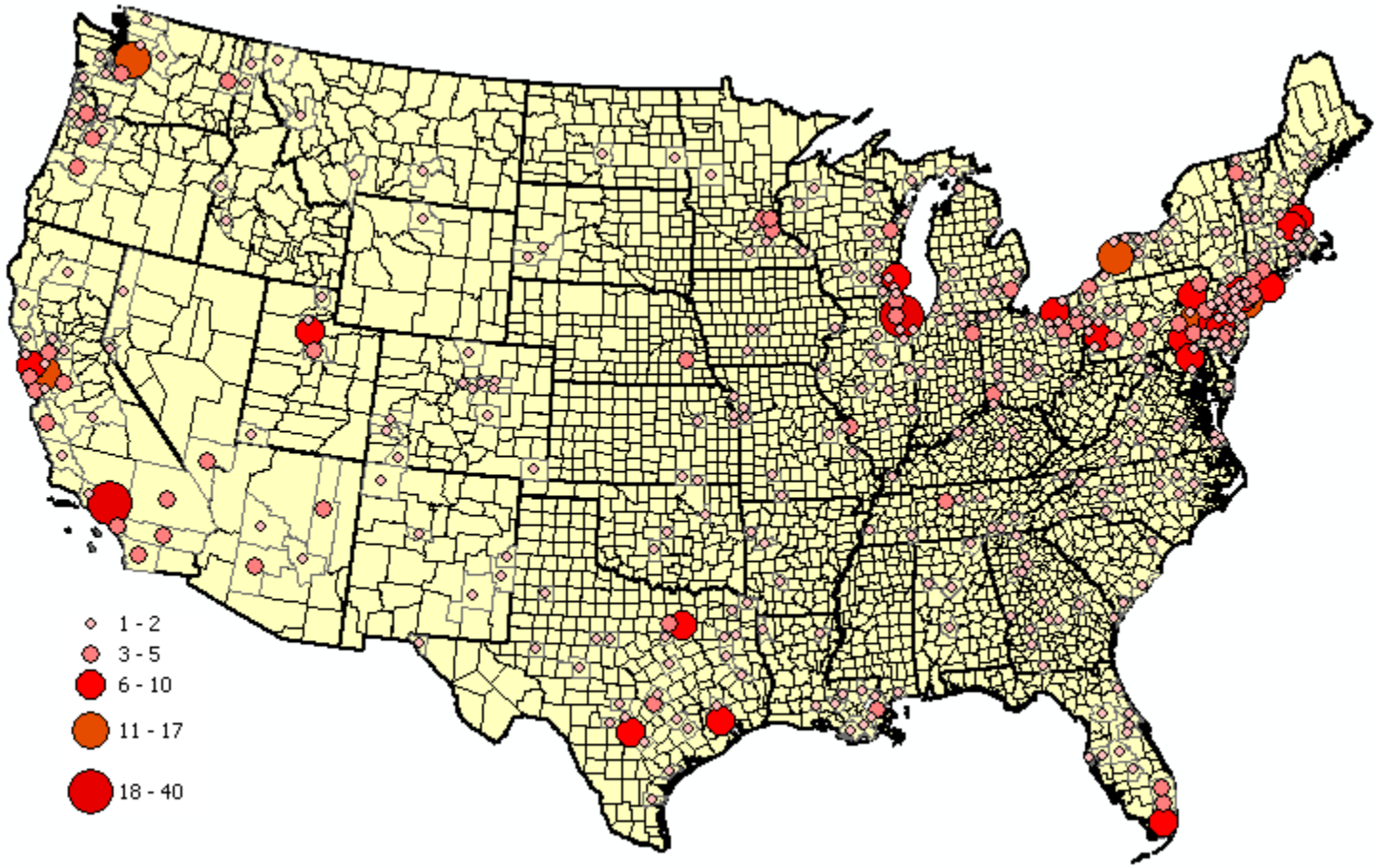

Figure I-4. Confectionery Manufacturer Locations in 1993

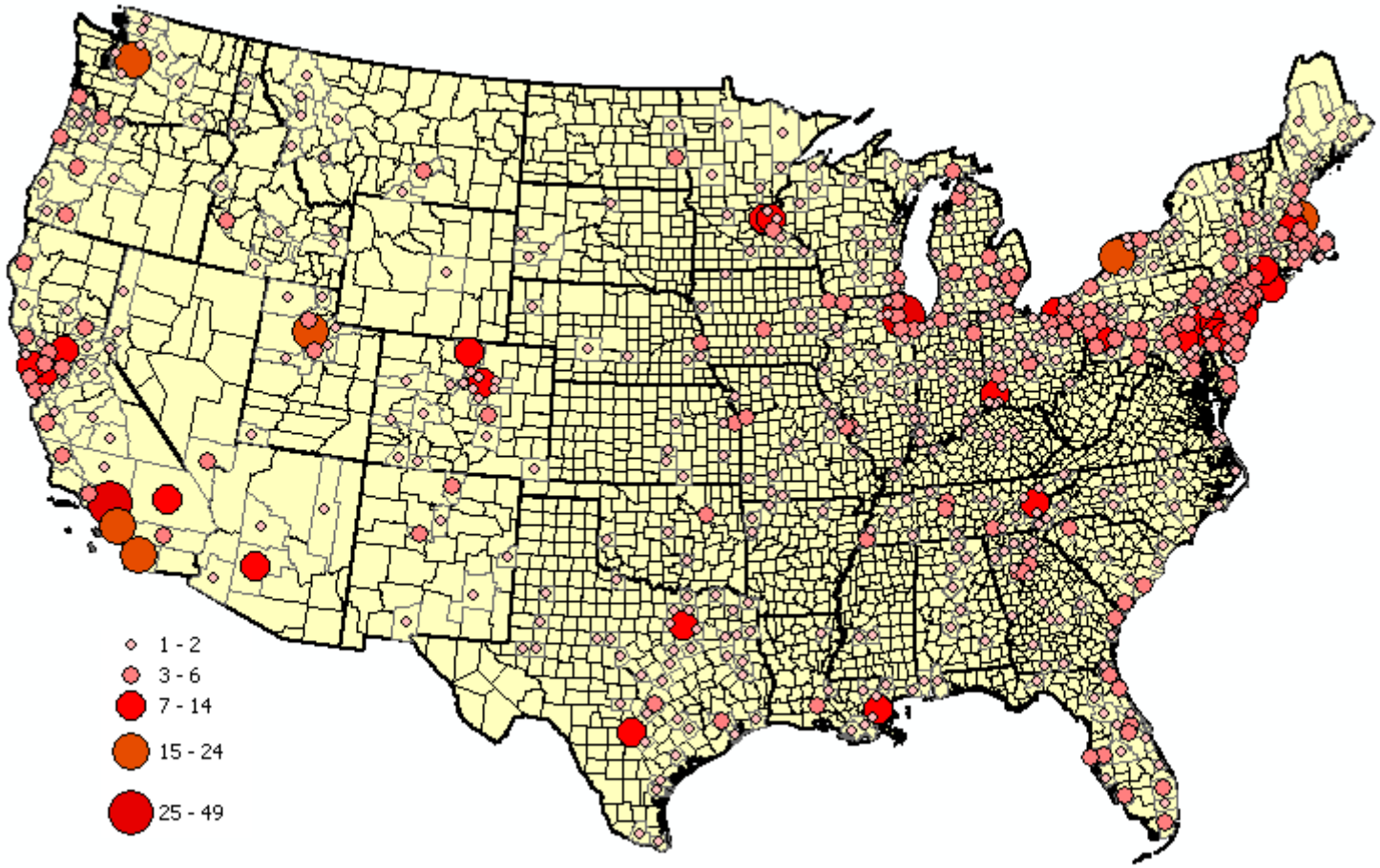

Figure I-5. Confectionery Manufacturer Locations in 2005

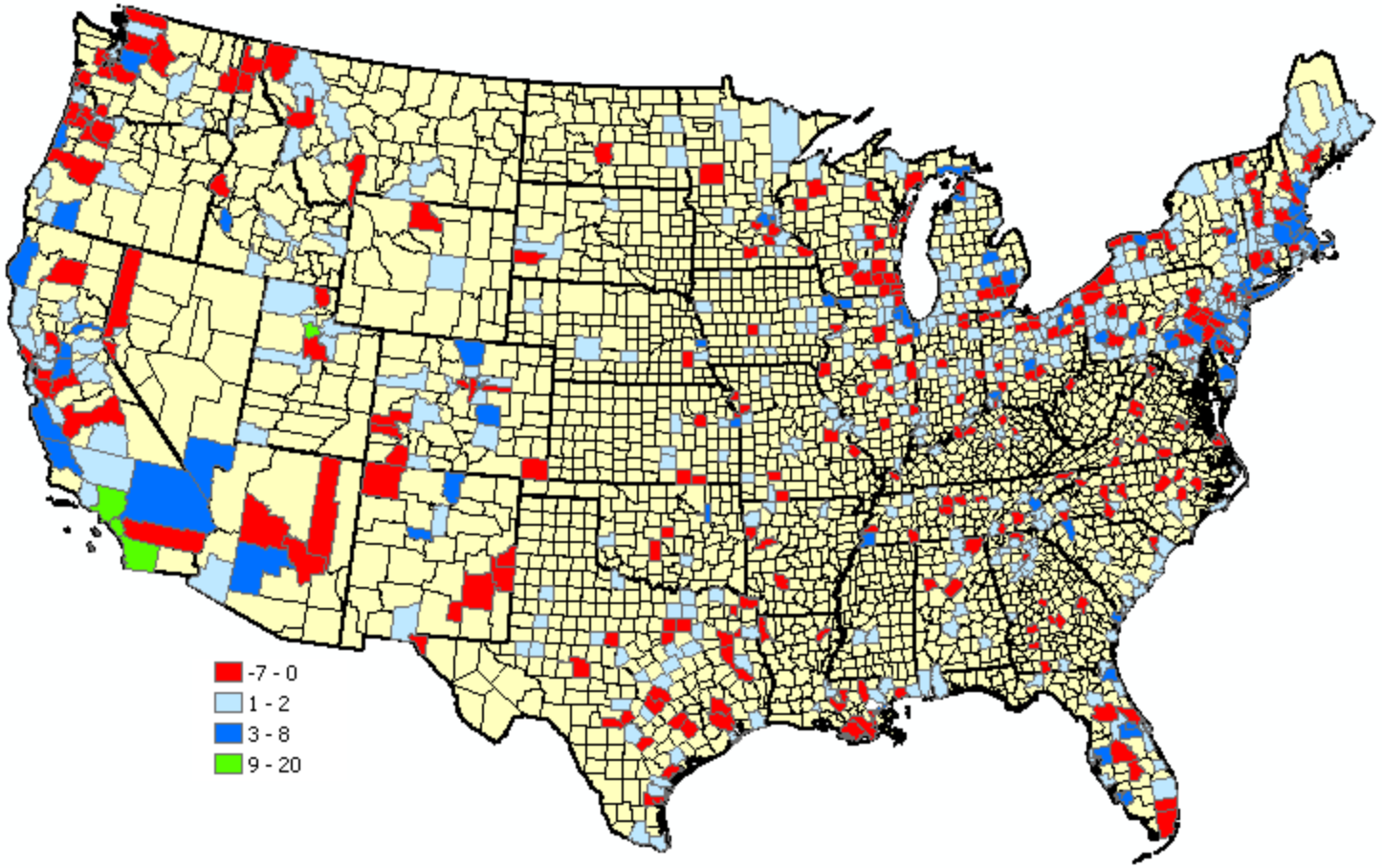

Figure I-6. Net Change of Confectionery Locations from 1993 to 2005

CHAPTER II

ECONOMIC GROWTH IN SOUTHEAST OKLAHOMA

Introduction

Industrial recruitment and expansion have long been a focus of economic growth and development efforts. Industrial recruitment, retention, and economic development are critically important to regions that historically have had lower incomes and higher unemployment rates than other areas. Regions experience different rates of growth and development and sometimes use unique policies and procedures to gain and sustain competitive advantages over other regions. Differences in regional growth and particularly sudden and sustained growth in some regions provide an opportunity to examine which factors are influencing growth. Growth experienced in regions with significantly better economic development signals the potential of a competitive advantage for the region that may be transferable to other regions that have similar characteristics. However, if the source of the competitive advantage is easily transferable to another region, the advantage is less likely to be sustainable.

The increasing global nature of business forces many companies to search out potential site locations that will provide a return on investment in line with the firms' goals. Coughlin and Segev (2000), Woodward (1992), and List (2001) are but a few of the studies that seek to determine factors that impact foreign investment in areas of the

U.S. The Sunbelt (southern and western) portion of the U.S. has had much success in the attraction of foreign and domestic firms due to lower taxes and a perceived better climate than the so-called "frost-belt" (eastern, northeastern, and north central regions of the U.S.) over the past thirty years (Carlino and Mills 1987; Garnick 1983).

Small businesses are no less important to a region's economy than the larger firms that locate in a region. The Small Business Administration (2007a, b, c) reports that small firms employ 50.9 percent of the nation's non-farm private labor force compared to 54.9 percent in Oklahoma and 48.0 percent in Texas in 2004. Evidence exists in the industrial location literature that many factors affecting entrepreneurs' location decisions are different than those influencing larger firms (Bartik 1989). While many entrepreneurial businesses may employ a small workforce, the creation of these jobs helps keep dollars in the local economy. The presence of business incubators in a community provide resources through financing, consultants, and low overhead that allow for smaller firms to gain the footing to survive in the long run.

Objectives

The objectives of this chapter are to:

1) Explain the change in employment percentage seen in Texas and Oklahoma counties between 1997 and 2005.
2) Determine factors that explain location of new firms and expansion of existing firms in Texas and Oklahoma counties between 1997 and 2005.
3) Explain the apparent extraordinary economic growth of counties in south central Oklahoma near Lake Texoma. These counties are: Atoka, Bryan, Carter, Coal, Garvin, Johnston, Love, Marshall, Murray, and Pontotoc.

Literature Review

Effects of Economic Growth Efforts

The term "economic growth" is often used interchangeably with "economic development" (Van Den Berg 2001; Shaffer, Deller, Marcouiller 2004). This is despite the argument made in Shaffer, Deller, and Marcouiller (2004, p. 3) that economic growth is "more of the same" while economic development "simultaneously involves social, environmental, and economic change to enhance quality of life." This may be a subtle difference but it is an important distinction. As Shaffer, Deller, and Marcouiller (2004, p. 4) note, economic development involves a "transformation, not just a change" that occurs over a longer horizon than does economic growth as it is a "goal-oriented change."

Economic development is difficult to measure because the goals and needs of the community must be taken into account whether that community is a town or county. Furthermore, economic development may appear to be economic growth in areas where income and employment levels traditionally lag behind other communities or counties. Change is facilitated by the presence of social capital to aid in the economic development transformation (Shaffer, Deller, and Marcouiller 2004; Flora, Sharp, Flora, and Newton 1997; Van Den Berg 2001). Economic development revolves not only around the presence of social capital but also economic institutions that provide for markets to function properly (Van Den Berg 2001). Economic growth can be the starting point as it would bring additional jobs to the area. However, as previously stated, this would not be a sufficient condition for economic development. Shaffer, Deller, and Marcouiller (2004) note seven strategies for economic development: increase the flow of dollars in the

community, increase the recirculation of dollars in the community, increase the amount of resources available, use existing resources differently, change the rules, act smarter, and get lucky.

The linkage between economic development and economic growth may be hard to identify, but the focus of this paper is specifically on factors leading to economic growth. Measurement of economic growth includes new firm location, the number of jobs, and income. Location theory, based on the idea of profit maximization, has been used to explain firm location since the late nineteenth century (Richardson 1979). Solutions to firm location problems typically are found at the point that minimized transportation costs. Another approach put forth by Greenhut (1956) is demand maximization. Basic tenets of this approach include no barriers to entry, uniform transportation rates from any site, customers and resources are uniformly distributed over a homogenous plane, and customers make purchase decisions based on minimizing the effective or delivered price of the good (Greenhut 1956).

Growth (and subsequently economic development) is the result of having the proper mix of resources available at the proper location to meet demand. The needed resources to spur economic growth in an area include land, labor, and capital. Recent focus has shifted away from traditional factors included in location theory to non-economic factors (Blair and Premus 1987). Development of the idea of clusters, defined as "geographically proximate groups of interconnected companies and associated institutions linked by commonalities and complementarities" (Porter 2000), have been emphasized replacing traditional location factors as principle explanations of firm location in places like the Silicon Valley in California. Porter (2000) goes on to state the

presence of clusters leads to the necessity for government and other institutions (e.g. economic development agencies) to re-assess their plans to remain competitive in a global economy. Shaffer, Deller, and Marcouiller (2004) note that successful clustering can lead to the creation of new firms that will expand and strengthen the cluster. Rosenfeld (1997) lists several aspects of industrial clusters that should be considered such as workforce skills, proximity of suppliers, capital availability, intensity of competition, and innovation. These considerations are reminiscent of industrial location factors including agglomeration and a suitable workforce. One of the disadvantages of cluster development is that the local economy will tend to be focused in one or a small number of closely related industries. The local economy then becomes greatly affected by the economic conditions of that industry's business cycle.

Entrepreneurship

The impact of entrepreneurship on economic growth and development can not be ignored. Bartik (1989) argues that entrepreneurship decisions are made differently than large firm location decisions because many entrepreneurs are frequently geographically tied to a specific location. The factors that determine the entrepreneurial activity in a geographic region are different than factors that influence the location of large manufacturing facilities. Lichtenstein and Lyons (2001) document the debate over whether the traits that an entrepreneur possesses can be developed or are innately endowed.

Regardless of this debate, entrepreneurs provide a valuable service to communities through their awareness of market opportunities. Van Den Berg (2001) notes that entrepreneurs may be managers more than inventors further obscuring the

characteristics that define an entrepreneur. Despite the assertion by Van Den Berg (2001), the U.S. Small Business Administration's Office of Advocacy (2003) states that small innovative firms produce thirteen times more patents than larger firms and are twice as likely to be in the one percent most cited of patents. Lichtenstein and Lyons (2001) state that entrepreneurs are the driving force behind the building of assets and wealth creation, which is at the center of their definition of economic development.

Central to successful formation of entrepreneurial firms are the "rules of the game" which include the legal system, tax rules, or other conditions in which the entrepreneur must operate (Van Den Berg 2001). The presence of social capital is also needed for an entrepreneur to be successful. Trust is needed for entrepreneurs to flourish due to interactions typically being in the market as well as access to diverse resources and information (Flora et al. 1997). Putnam (1993) and Duncan (1992) document the lack of social capital and its impacts on economic development. Putnam (1993) attributes slower rates of economic development in southern Italy to low levels of social capital compared to northern Italy. Putnam (1993) also finds that citizens in the south are less likely to follow established rules and expect fellow citizens to behave in a similar fashion. Duncan (1992) finds the presence of hierarchical social capital in Appalachia which discourages change that would damage existing power structures. Although not the focus of this paper, the previous statement underscores the statement by Shaffer, Deller, and Marcouiller (2004) that development goes against the status quo due to its destructive nature.

The term "creative destruction" was first described by Schumpeter in 1934. At the center of creative destruction is the entrepreneur who develops innovations and, in the

process, destroys market power that has been accumulated by prior innovations. Schumpeter (1934) emphasizes the economic institutions that play a role in entrepreneurship. Inappropriate social and economic institutions can stifle the entrepreneur and the economic change that can result from the innovations that are a result.

Although the discussion regarding entrepreneurs to this point has been primarily in reference to traditional business entrepreneurs, this framework can also extend to the idea of an entrepreneurial community. Flora et al. (1997) find that communities with projects are more likely to have an unbiased newspaper, have several types of financial institutions to contribute to community projects, have a large number of linkages to other communities, and provide few formal mechanisms to provide input into local government budget processes. These factors are attributed to a legitimacy of alternatives, resource mobilization, diverse networks, and the input into governmental budget processes that is viewed as a negative indicator of the legitimacy of alternatives. Flora et al. (1997) state that communities lacking these factors can change and these factors are a product of community history.

Community entrepreneurs possess the ability to mobilize networks (whether inside or external to the community) in order to solve problems faced by the community (Shaffer, Deller, and Marcouiller 2004). This is consistent with the previously mentioned idea that entrepreneurs see potential market opportunities present for the community. As a result, leaders in the community communicating visions for the locality will, in time, possibly create a comparative advantage (Shaffer, Deller, and Marcouiller 2004). Pryde (1981) describes four qualities of entrepreneurial communities: 1) recognize

opportunities and develop plans to take advantage of them, 2) identify resources that are necessary to achieve the objective as well as obtain that resource if necessary, 3) the ability to manage political relationships, and 4) the ability to motivate persons and maintain interpersonal relationships. These ideas are similar to the idea of social capital and trust described earlier.

Southeast Oklahoma

The area of southeast Oklahoma has experienced growth over the past several years that outpace the rest of the state. This area includes 19 counties south of a line extending west from the counties of LeFlore to Pottawatomie on the western edge and extending south from the counties of Pottawatomie, Murray, Carter, and Love (see Figure 1). The area includes one metropolitan county (LeFlore) and six micropolitan counties (Bryan, Carter, Love, Pittsburg, Pontotoc, and Pottawatomie). A micropolitan county is a county with at least one major employment center and a population between 10,000 and 50,000. This area has had a 7% population growth from 1990 to 2000 and a 1.9% growth from 2000 to 2005 in comparison to a state rate of 9.7% from 1990 to 2000 and 2.8% from 2000 to 2005 (U.S. Census Bureau as cited in Barta et al 2007). Percentages exclude LeFlore County since it is defined as a metropolitan county.

Employment growth in southeast Oklahoma has occurred at 10.1% from 2000-05 which outpaces even the rate of metropolitan areas in Oklahoma's growth rate of 2.1% over the same time period (Bureau of Labor Statistics as cited in Barta et al 2007). Southeast Oklahoma is second in growth among Oklahoma regions in personal income

from 1997-2004 at 38.2% growth, but this region of the state has historically lagged behind the state average per capita income (Barta et al. 2007)

Ten Oklahoma counties (Atoka, Bryan, Carter, Coal, Garvin, Johnston, Love, Marshall, Murray, and Pontotoc) have recently formed the Texoma Regional Consortium (TRC) along with three Texas counties (Cooke, Fannin, and Grayson) that are immediately adjacent to Lake Texoma (see Figures 2 and 3). These counties are approximately a ninety minute drive from the Dallas metroplex. Collectively the counties seek to address common issues in an effort to improve the life of all residents in the TRC and attract firms to the TRC. Some of these issues that will be addressed by the TRC include lack of a skilled workforce as the area lags behind the national and state averages (both Texas and Oklahoma) in terms of population that have more than a high school diploma, migration of young people to areas with better chance of career advancement, and lack of telecommunication and information technology infrastructure. The area is fortunate to have several amenities including national wildlife refuges, Lake Texoma, and Native American operated casinos.

The fact that the Texoma Regional Consortium is in its infancy makes it difficult to accurately reflect its impact in an empirical analysis. Its formation does, however, reflect the fact that leaders in each individual county understand that a collective effort to address common issues would be more successful than thirteen counties trying to address issues individually. Addressing issues individually would be a drain on resources and produce even more of a competitive nature than is already present in economic development, specifically the luring of firms and entrepreneurs to a community or county. Such common effort will provide spillovers that positively impact each

county/community in the region (Gordon 2007). It also signifies that there is a level of social capital among community leaders (namely trust) that is present and strong enough to bring the counties together on issues that can not be solved alone.

Some research has been conducted on the impacts of regional consortiums which can be used to form a picture of what TRC will face in the future. Gordon (2007) documents the regional economic development efforts in Illinois which has a long standing history of supporting cooperative effort in economic development. This can be contrasted with the states of Oklahoma and Texas, which have had a stormy relationship in the early parts of the twentieth century and must work past feelings of mistrust that may result from working with a county on the other side of the Red River. Borich's (1994) analysis of multi-community development organizations in Iowa found that the organizations were typically confined to communities in the same county but most of the alliances were started voluntarily without a government/external mandate. Gordon (2007) finds that communities in central Illinois may not always recognize who their competitors are despite there being a strong sense of competition ingrained into county/community leaders. Additionally, Gordon (2007) notes that some community leaders had difficulty realizing that economic development is not just about the creation of jobs, but is also about affordable housing, crime prevention/control and quality school systems. The ability to develop the resources to maintain proper infrastructure for the present as well as the future should not be ignored. As Borich (1994) notes, achievement of goals "allows for more organized development efforts while maintaining a high degree of local control" which should ease concerns over loss of identity among community leaders.

This introduces the idea of an ally who will work in concert with a community/county to help increase the profile of the area due to the vested interest the entity has (Gordon 2007). Allies may take the form of local utility and telecommunication entities, community colleges, universities, and city, county, state and federal agencies. TRC has acknowledged the need for the inclusion of representatives from these groups as active members of the consortium as the TRC collectively attempts to address issues the area is facing.

Durant/Bryan County

The Durant/Bryan County area has been actively trying to increase its attractiveness to firms in an effort to increase economic development in the community and county. One innovative idea is the concept of TEAM Durant. The team is actually a logo and is comprised of various city government, business, and community leaders. Teams are formed to recruit individual companies and team membership will vary based on the characteristics and needs of the firm being recruited, but each team consists of people that are in a position to make a difference in each recruitment project. The persons that represent the city including the mayor and city manager, as well as the Durant Industrial Authority and Economic Development Council. Other members include representatives of local banks, a regional technology center, utility companies, Southeastern Oklahoma State University, and the local medical facility. Leadership from the county level is obviously missing, but as TEAM Durant is an outreach of the city of Durant, the Durant Industrial Authority cannot provide financial assistance to firms outside the city limits. This team-based approach to economic development is an example of the allies that should be involved in the economic development of a region due to their vested interest

(Gordon 2007). Efforts are not solely devoted to the attraction of new firms to the area as community leaders continue to work with existing firms in Durant to ensure firms have the resources to be successful members of the community, exhibiting a service after the sale attitude.

Another factor that bears discussion is the presence of Rural Enterprises, Inc. (REI) in Bryan County. REI operates ten business incubators throughout the state of Oklahoma that are available for small companies that are in a variety of industries including manufacturing, services, and technology. REI operates two incubators in Bryan County (the headquarters in Durant and an additional facility in Bennington) that have space for a total of eleven companies with an additional two incubators in nearby Oklahoma counties that are a part of the TRC (Atoka and Coal Counties). Each incubator offers floor space for small companies as well as financing, government contracting, and international trade assistance as Durant has a free trade zone.

A 2005 report by the Oklahoma Department of Commerce lists the presence of Allied Stone, Inc., a Singapore based company, as a success story due to the presence of the REI incubator in Durant. The presence of business incubators in the state of Oklahoma has led to the creation of over seven hundred jobs with a steady increase in the number of jobs since 2002 (Oklahoma Department of Commerce 2005). The presence of incubators is important as 80% of businesses started in incubators are successful compared to the 80% of small businesses that fail within the first five years (Oklahoma Department of Commerce 1998). Lichtenstein and Lyons (2001) warn that upon graduation from the incubators firms do not always know where to go to learn the skills to raise their businesses' profiles. Business incubator managers need to be aware of this

assertion and possibly work with graduated firms to identify additional resources that can provide the necessary skills.

The city of Durant does have zoning laws that enable companies to locate in an industrial zone although Bryan County does not have zoning laws. Gordon (2007) finds evidence that citizens believe zoning laws do make a difference among potential sites as zoning laws are "not just protecting from what we don't want, it's protecting the business, too." Counties adjacent to Bryan County do not always have zoning laws that may or may not aid the in attraction of new firms. Karakaya and Canel (1998) do not find zoning laws to be a factor considered in their meta-analysis; although, empirical results from the study found that availability of an industrial park is not an important factor for surveyed site selection specialists, chief executive officers, and consultants. However, some of the factors in the meta-analysis are attitudes of state and local government officials as well as the area's business climate (Karakaya and Canel 1998) which could include the presence of zoning laws as well as entities like TEAM Durant. Inclusion of the presence of zoning laws would be difficult as communities might impose them while the surrounding county would not making differentiation of this fact difficult.

Further evidence of the growth seen in Durant and Bryan County is through the retail trends and taxable sales that have been steadily growing over the past several years. Brooks et al. (2008) note that the service sector, of which retail sales is a component, tends to attract existing dollars in the community as opposed to attracting dollars from outside the community as the service sector is dependent on the manufacturing and agriculture sectors. Strong retail sales in a community signify a strong economy that has the tax base to provide for important municipal services such as education, police, and

fire protection. Durant has seen an 84% growth in nominal sales tax collections between 1997 and 2005, which represents a change in total taxable sales from approximately $147.7 million to $230.4 million (a 56% increase). Total sales tax collections and total taxable sales may be found in Table 1. It should be noted that from 1997 to September 2004 the sales tax rate was 3.0%, which then increased to 3.25% until June 2005 when 3.75% became the new sales tax rate. Real sales tax collections do not shown as drastic an increase, but a more steady increase especially since 2002. Only three Oklahoma counties (Bryan, Carter, and Pontotoc) in the TRC have had over a hundred million dollars in retail sales collections since 1997. Growth in sales tax collections and total retail sales are less than Bryan County's nominal rate of growth. Carter County has seen a 59.0% growth in tax collections with the half percent increase which translates into a 34.5% growth in retail sales while Pontotoc County has seen a 28.5% increase in sales tax collections and a 28.5% growth in retail sales.

Other methods of depicting the overall economic health of a community is through trade area capture and pull factors. Trade area capture measures the number of persons that are shopping in a community with estimates larger than the community's population as a result of attracting consumers from outside the boundaries of the community or local residents spending more than the state average (Brooks et al. 2008). Table 2 shows the trade area capture for Durant since 1980 with the town normally capturing ten thousand customers more than Durant's population in a given year (Brooks et al. 2008). Some of this may be attributed to the over thirty thousand residents of Bryan County since 1980, but from 2003 to 2005 the trade area capture is double the population of Durant. An additional portion of this capture may be attributed to Durant's proximity

to Lake Texoma and the tourists that visit the many marinas and resorts that are located in the county. Figure 4 depicts estimated retail sales for Durant between 1980 and 2007 using nominal and real dollars.

Pull factors are simply the trade area capture for a community divided by the community's population. Durant has a strong history of a pull factor of at least 1.5 which signifies that Durant is attracting more than its own citizens to shop at local stores. Other communities in the county have pull factors of 0.027 to 0.470 (Brooks et al. 2008) signifying Durant is likely attracting several of the residents in these communities. Figure 5 illustrates that Durant has typically outperformed other Oklahoma communities of similar size in terms of its pull factor. This is important because a high pull factor attracts dollars that will stay in the community and the dollars which can then be used for the improvement of municipal services and infrastructure. Undoubtedly, the high pull factors are partly attributable to the presence of a Lowe's and Wal-Mart Supercenter in Durant. The nearest Lowe's is 30 miles away in Sherman, TX, while the nearest Wal-Mart Supercenter is 20 miles away in Denison, TX. Other Oklahoma members of the TRC had similarly high pull factors (Atoka, Carter, Marshall, and Pontotoc) while the remaining Oklahoma members of the TRC have pull factors typically near 1.0. Communities with these high pull factors are successful in keeping money in their community and potentially re-circulating that money several times. This could be a result of shop at home campaigns as well as the type of stores available to consumers. These factors could help spur growth as suggested in Shaffer, Deller, and Marcouiller (2004).

Despite a waning, but still significant importance of traditional location factors relative to non-economic factors (Blair and Premus 1987), firms may be moving to

southeast Oklahoma to have access to a growing area of the country. The industrial location literature documents the movement of firms to the Sunbelt portion of the U.S. over the past thirty to forty years. Such movement would give firms close proximity to the Metropolitan Statistical Areas (MSAs) of Dallas/Fort Worth, TX, Oklahoma City and Tulsa, OK, and Fort Smith and Little Rock, AR. These areas can be seen as emerging markets that may be underserved. It is important to note that relocation of existing facilities to another location is rare and that high-growth communities have an additional focus on expansion of existing facilities (Blair and Premus 1987). However, Plaut and Pluta (1983) state that abundant labor, cheap land, and desirable climate explain the growth seen in the southern and western parts of the U.S. as opposed to market pull factors.

Location theory

The study of firm location decisions is based on the desire of the firm to maximize profits. Schmenner (1982) uses the two step process to the firm location decision which allowed the decision process to be "manageable by first choosing a subset of locations for further analysis and then choosing one location out of that subset." Plaut and Pluta (1983) note that "most of the industrial location literature puts heavy emphasis on traditional market factors; specifically access to markets, cost and availability of labor, cost and availability of raw materials, and the availability of adequate transportation facilities, in explaining regional industrial growth." A vector representing the amenities present to labor may be included, but difficulties arise with specification of the amenity vector as these are not enjoyed at the worksite by employees, but at the employee's place of residence (Gottlieb 1995). Gottlieb (1995) states amenities may be viewed as a non-

economic location factor to the point that firms locate in high amenity areas to take advantage of an existing labor force as well as to recruit a new force.

Schmenner, Huber, and Cook (1987) separate the independent variables into state specific effects that advance or hinder the probability of opening a plant in a given state and plant specific characteristics that magnify or temper the state effects. Schmenner et al. (1987) note that less variation is expected among states that pass the first stage, but differences will exist among important factors from stage one to stage two. They further hypothesize that the first stage variables are most important to firms with the least amount of uncertainty present.

Highly aggregated data sets are common until the use of large micro data set to model location in Bartik (1985, 1989) and Levinson (1996). The ability of the conditional logit model to handle large data sets still poses hurdles to researchers as it ignores useful information and results in less efficient estimators (Guimarães, Figueiredo, and Woodward 2004). Large micro data sets that have only recently become available have aided the study of location decisions. Prior to the availability of these data sets, research has been conducted at higher levels of aggregation such as U.S. states which masked "substantial heterogeneity with themselves" with California used as an example (Guimarães, Figueirdo, and Woodward 2003). Guimarães, Figueirdo, and Woodward (2003) cite differences in labor market conditions and cost of land as factors that are not readily apparent when large geographic units are incorporated into firm location models. Availability of data is still constrained somewhat as costs including land and energy are not always readily available at county levels.

Karakaya and Canel (1998) have a long list of different factors affecting location decisions that have been used in various firm location studies ranging from the cost of labor to residential housing to cost of municipal services. This study uses factor analysis to determine the factors that are important in site selection decisions important to industry executives and site selection consultants through use of a questionnaire. Results are also analyzed by industry (manufacturing, banking, insurance, consultants, and retail business) as well as industry size. Karakaya and Canel (1998) conclude that skilled labor availability, transportation facilities, state tax rates, and the regulatory environment are the four most important factors based on the firms surveyed in New York and New England.

An often controversial aspect of location studies is the impact that tax and economic incentives have on luring of firms to a region. Incentives available to one firm may not be available to another firm that is considering location in a given county. Bartik (1985) notes that wide variation is present in tax rates among localities and states as well as the assessment method, such as tangible personal property or real property. Plaut and Pluta (1983) conclude that tax variables are significant in state employment and capital stock growth, but not in overall industrial growth (defined as change in real manufacturing value added). This finding seems intuitive as taxes would prevent the location of firms in states with high tax burdens (whether state corporate or local property taxes) as they would be eliminated from consideration after stage one. Bartik (1989) lists various elasticities of business activity measures with respect to various tax rates. Included elasticity estimates range from -0.06 to -0.64 depending on the type of tax in the

cited studies which are small compared to other market forces such as population from Bartik (1989).

Conceptual Model

Firm location theory is based on an independent two step process (Goetz 1997; Blair and Premus 1987; and Woodward 1992). The initial step of the process is to select regions for consideration in the final decision with the final step to select certain areas that are not eliminated after the initial phase to be considered in the final decision. Henderson and McNamara (2000) state firms initially seek to identify regions in an effort to gain access to "raw materials, entrance into product markets, or increase market share" in line with the firm objectives.

Industrial location literature suggests that

(1) $Est_i = f(\mathbf{M, L, I, A, F})$

where Est_i is the number of firm births in county i, **M** is a vector of market factors, **L** is a vector of labor market characteristics, **I** is a vector associated with infrastructure in county i, **A** is a vector of agglomeration economies, and **F** is a vector of fiscal polices. This equation represents the second stage of the final decision process. An additional vector of amenities and quality of life is sometimes included in some location studies.

Procedures

The first objective of this paper is to explain the change in county employment percentage from 1997 to 2005. Plaut and Pluta (1983) demonstrate that factors affecting employment changes would not be different from factors affecting new firm births and hence no additional variables would be necessary to explain change in employment

growth, as shown in equation (1). This would also begin to capture the presence of entrepreneurs in a county and their impact even though factors affecting entrepreneurial formation are not included.

Estimation of relationships similar to equation (1) has used conditional logit (Woodward 1992; Levinson 1996)), a net growth model over a given period of years (Goetz 1997), and a count data model, specifically the Poisson model (Henderson and McNamara 2000; List 2001). Any procedure that is used to estimate equation (1) would need to account for the fact the firm births or expansions are censored at zero which prevents the empirical estimates from being inconsistent. The estimated models are then

(2) $New_i = f(\mathbf{M, L, I, A, F})$

and

(3) $Expansion_i = f(\mathbf{M, L, I, A, F})$

where *New* is the number of new facilities in county *i* and *Expansion* is the number of facilities expanded in county *i* with the independent variables retaining their definitions from equation (1).

Data

Dependent variables

Data on new plant openings and expansions in Texas and Oklahoma from 1997-2005, a nine year period is obtained from Conway Data, Inc. To be included in the data set provided by Conway Data, a firm must have opened a facility that is either (1) an investment of $1 million or more, (2) have a floor area of at least 20,000 square feet, or (3) plan to employee at least 50 persons. Expansion of existing facilities is also included

in the data set and is analyzed separately from new facilities as shown in equations (2) and (3). Excluded facilities include law firms, shopping malls, hospitals, museums, schools, and government facilities. While these excluded types of facilities are a sign of economic development, arguably these are primarily service based industries that follow more traditional measures of economic development such as manufacturing and warehousing facilities. Hence this data set is not entirely exhaustive of all firms that are created in Texas and Oklahoma over this time period. Its main fault is that it fails to account for small businesses that open or expand operations in a given county. This can be problematic as results may over or underestimate actual factors that attract new businesses and hence lead to economic growth and development. However, as already noted, Bartik (1989) suggests the factors affecting entrepreneurship are different from larger firms looking to expand or locate a new facility. In addition, it would be expected that many of the smaller firms are providing services or inputs to the larger firms and that the number of smaller firms would be highly correlated with the number of large firms that enter a specific market.

A number of speculative buildings (warehouses, offices, hotels, and for manufacturing) are included in the data set purchased from Conway Data, Inc. All establishments that are listed as hotels (including speculative and mixed use) are excluded from use in this study as well as speculative office buildings. Speculative office buildings are excluded as these buildings do not represent actual new firm location or expansion. These buildings represent potential areas of growth, but may never have been filled between 1997 and 2005. (Those speculative buildings filled would be accounted for in the change of employment growth model.) Speculative warehouses and

manufacturing facilities are retained due to the assumption (especially with warehouses) that construction would not have occurred unless they could be filled. Speculative office buildings are deleted unless they are of mixed use with a warehouse, manufacturing headquarters, research and development, or a call center. A total of 794 observations in both states are excluded due to these assumptions. Additionally, all observations are listed as new or expansions in the data set. There are eight observations that are not listed as either new or expansion and are ignored. Some observations do not list a county but are identified through the city the firm is locating in with additional observations listing cities whose borders overlapped several counties. In the latter situations, the firm is assumed to be in the county that contains the majority of the area of the city.

An additional dependent variable in this research is the change in employment between 1997 and 2005. This data is obtained from the Bureau of Economic Analysis Regional Economic Information System (BEA REIS). This is an improvement of the data provided by Conway Data Services as it measures total percentage change in employment in all counties in the states of Oklahoma and Texas between 1997 and 2005. Due to wide differences in counties in Texas and Oklahoma, only counties that had population under 50,000 persons in 1997 are included in this study[3]. These differences are largely due to metropolitan areas such Dallas/Ft. Worth, Houston, San Antonio in Texas and Oklahoma City and Tulsa in Oklahoma. Inclusion of these large metropolitan areas would skew results and mask results for counties that are more rural in nature. This reduces the number of counties included from 331 to 265.

[3] The following counties in Texas are excluded: Bell, Bexar, Brazoria, Brazos, Cameron, Collin, Dallas, Denton, Ector, El Paso, Ellis, Fort Bend, Galveston, Grayson, Gregg, Harris, Hidalgo, Jefferson, Johnson, Lubbock, McLennan, Midland, Montgomery, Nueces, Potter, Smith, Tarrant, Taylor, Tom Green, Travis, Webb, Wichita, and Williamson. The following counties in Oklahoma are excluded: Cleveland, Comanche, Oklahoma, and Tulsa.

Independent Variables

Consistent with the industrial location literature, factors hypothesized to affect business location decisions are accessibility to markets, labor market characteristics, agglomeration economies, and variables related to the fiscal policies present in the county.

Market factors. County population in 1997 was collected from the BEA REIS. This is used to calculate the population density (persons per square mile) after scaling it by total county square mileage. One benefit from using population density rather than population is that it can be used as a proxy for land costs which are not readily available. Bartik (1985) mentions this fact as all persons in a county compete for land whether for residential or industrial purposes. Nominal per capita personal income was also obtained from BEA REIS for the year 1997.

The final variable in the market factor vector is similar to the personal income potential variable that is described in Plaut and Pluta (1983) and Goetz (1997). This ratio allows for the gravity adjustment of flows between county *i* and county *j*. Plaut and Pluta (1983) then divide the personal income potential portion by the manufacturing value added potential, but that is not done here for two reasons. First, manufacturing value added is not disclosed for every county in Oklahoma and Texas in 1997 due to the possibility of publishing proprietary information or simply lack of manufacturing activity in the county. Second, there is a desire to test whether the market pull factors have an impact even though pull factors have been dismissed in studies that use state level data (Plaut and Pluta 1983). Given that this study employs county level data the pull factors may be more relevant than when state level data are used

The market differential variable (MDV) in this paper relates the difference in per capita personal incomes (in thousands) between the county *i* and the county *j* with the nearest MSA (from the 2000 Census). The difference is then divided by the distance between the county *i* and the MSA in county *j*,

$$MDV = \frac{PCPI_i - PCPI_j}{d_{ij}}. \quad (5)$$

Distance is in straight line miles as opposed to road miles. This is due to latitude and longitude coordinates that are obtained for every county's center of population from the 2000 Census which then was used to calculate the straight line distance to the nearest MSA using the Haversine formula. Coordinates from the 2000 Census are typically close to the county seat although this is not always the case. Distances are initially calculated in kilometers, but are converted to mileage by multiplying the kilometers by 0.6214. There are a total of twenty-nine MSAs included in this research (24 in Texas, 3 in Oklahoma, and 2 in Arkansas). The two MSAs in Arkansas are Fort Smith (which includes LeFlore County, OK) and Texarkana (which includes Bowie County, TX) which leads to inclusion into modeling efforts.

Labor factors. Average wage, value added by manufacturer, and value of shipments are not available for every county in Oklahoma and Texas. Value added by manufacturer and value of shipments are not available due to lack of manufacturing activity in the county or the possibility of releasing proprietary information. Average commute time from the 2000 Census as well as the percent of the employed persons working outside the county of residence are included.

The presence of union activities is well documented in the industrial location literature. Often, right to work laws are included in the respective studies as a measure of

union activity in a state. Both the states of Texas and Oklahoma have right to work laws preventing forced union membership. Right to work laws for Oklahoma are enacted in 2001 while Texas' current version of the law has been in effect since 1993 (National Right to Work Committee 2008a, b). Thus, union variables are not included for the reasons above as well as union data is not available at the county level. The percentage of persons over twenty-five with at least a high school degree is another possible variable, but this variable is only published by the Census Bureau at the county level in census years.

Infrastructure. The use of an infrastructure vector is included to include variables that measure the level of public services in the county. In many studies, it is primarily used to measure the access of the county to interstates or the number of road miles. The number of road miles is obtained from the U.S. Department Transportation for Oklahoma and Texas counties in 1997. Road miles are classified as urban or rural road miles by the U.S. Department of Transportation. Several different categories define the road system in the U.S. depending on if the road is in a rural or urban area. Total road miles for roads that are defined as interstate, principal arteries, and expressway/freeway miles are used in this study. Total road miles is then adjusted for the total size of the county (in square miles) which is an improvement over just including a dummy variable for the presence of an interstate crossing the borders of the county.

Agglomeration. Variables that measure agglomeration in this study include total manufacturing establishments. This factor assesses the possible linkages (i.e. spillovers) present from a firm locating in a county with other similar firms that signal the presence of a skilled workforce or the ability to reduce costs through shared knowledge passing

from one firm to another. The total number of manufacturing establishments is obtained from the Census Bureau's County Business Patterns.

Fiscal. Despite the proximity of Texas and Oklahoma, variation in assessment and collection of taxes does exist. Total property taxes per capita by county in 1997 are from the Census of Government. The Advisory Commission on Intergovernmental Relations (ACIR) would have been an ideal database for information regarding state and local business taxes. However, the ACIR has not been in operation since 1996 preventing any data being available for 1997 when most of the variables measured in dollars are collected. The effective sales tax for the county is included which reflects the county seat, county, and state sales tax rates. Rates in place for 1997 are for the county seat, the county, and the state for all Oklahoma and Texas counties from the Texas Comptroller's office as well as Oklahoma Cooperative Extension Service. Collected rates for Oklahoma are for the 1998 fiscal year. Sales tax rates are adjusted mid-year in six communities (Sapulpa, Medford, Perry, Ada, Duncan, and Frederick) and eight counties (Delaware, Garfield, Greer, Harper, Love, Mayes, McCurtain, and Roger Mills). In these instances, a weighted average of the two tax rates based on the number of months in effect is calculated as the rate for the community/county. Four counties (McClain, Oklahoma, Okmulgee, and Pontotoc) are treated as having no county tax rates as the rate expires during the 1998 fiscal year.

Community sales tax rates in Texas are provided by the Texas Comptroller's office on a quarterly basis. The (weighted) average rates are used due to changes mid year in eleven communities (Meridian, Paducah, Waxahachie, Gonzales, Hallettsville, Centerville, Groesbeck, Goldthwaite, Carthage, Monahans, and Wichita Falls). A

number of Texas communities have special sales tax rates for items including public transportation, but are ignored in this study.

Quality of Life. Although quality of life is somewhat hard to measure, a vector of quality of life variables is included in this analysis. The number of violent crimes in each county is obtained from the Census Bureau. Gottlieb (1995) states that firms care about violent crime inside the area they locate and not where the employees live. Borden County, Texas, does not report a violent crime for 1997. As only one violent crime is reported in 1996 and none in 1998, zero violent crimes is assumed to have occurred in 1997. Additional variables include the per capita police and fire expenditures in the county from the Census of Government as well as the per pupil expenditures on education. This variable could be included in the labor vector, but is included here due to the idea that education is a public good and increased levels of it benefit all persons in a county. One county, Loving County, Texas, reports no educational expenditures in 1997. Weather related factors such as the number of sunny days and the average number of heating degree days have been used in previous studies. Due to the similarity in climates between Oklahoma and Texas, these are ignored.

Empirical Results

Summary statistics and expected signs are provided in Table 3 for all explanatory variables. Table 4 is the correlation matrix for all dependent and independent variables.

Heteroskedasticity is detected in the percentage change in employment for counties in Oklahoma and Texas over 1997 to 2005. A maximum likelihood generalized least squares (GLS) estimator available in proc mixed in SAS 9.1 is used to correct for heteroskedasticity.

Results for the percentage change in employment model are presented in Table 5. It is important to note that all employment are included which means that expansion or addition of retail stores, hotels, casinos, service industries, manufacturing, and government jobs are all included. Longer commutes have a positive impact on percentage change in employment in counties between 1997 and 2005. It is expected this would have a negative impact on percentage change in employment. The length of commute (in minutes) may actually be a reflection of the distance that persons are willing to travel to be employed or the addition of retail and service sector jobs in communities in which people are commuting longer distances for employment. Persons may sacrifice a longer commute to be able to enjoy amenities in the county of residence that may not be in the county in which they are employed. Micropolitan areas also are positively and significantly different in generating higher employment changes than counties that are non-metropolitan/non-micropolitan. This suggests that micropolitan areas have sufficient social capital, amenities, and resources to create new jobs. Furthermore, this may be indicative of retail stores moving to the county due to goods being in higher demand as a result of increased incomes (which is also significant) that result from higher levels of employment in a county. The positive and significant impact of population density is a reflection of labor availability that can be recruited for employment as well as the potential market for goods and services. Income is found to have a small, but significant, negative impact on change in employment suggesting potential investments are made in areas with lower incomes to save on labor costs.

The ratio of road miles to land area also had a positive impact on employment growth. This suggests that improved infrastructure, in the form of roads, encourages

growth whether from an entrepreneurial or service sector aspect. Given the fact included counties have less than 50,000 persons in the county, the presence of highway/interstate miles does spur employment growth. Surprisingly, sales tax levels are more detrimental to employment growth than are per capita property taxes although the estimated elasticity for sales taxes is small.

Counties that spend additional monies on police services per capita are negatively correlated with changes in employment percentage. This is consistent with the number of violent crimes having a negative impact on change in employment. While this may appear to be in conflict with Gottlieb's (1995) finding, Gottlieb was concerned with industrial location and not necessarily employment changes. The fact that police and educational spending are significant suggest that strong tax bases are needed to provide these services, but can also attract growth in the case of educational expenditures.

The state of Texas also holds an advantage in creating jobs in counties under 50,000 persons during the time period in the study relative to Oklahoma. This may not be surprising given the vast amount of resources available in Texas in terms of capital and labor. This could also be a result of possessing the necessary social capital to attract entrepreneurs and develop them that Oklahoma is lacking. The Texoma Regional Consortium counties have a positive impact on the creation of jobs relative to all other counties in the study. This may be a result of increased service sector jobs locating in the area as well as manufacturing employers that are not included in the data set provided by Conway Data, Inc. due to the company's size.

Estimated results for a heteroskedastic Tobit for new facilities and expansion of existing facilities are shown in Table 6 with the estimated heteroskedastic terms shown in

Table 7. Multiplicative heteroskedasticity is assumed for the error term according to the form

(6) $\sigma_i = \sigma e^{\gamma' z_i}$

where σ_i is the disturbance term for tobit model for observation i, γ is a scalar of estimated parameters, and z_i is a vector of explanatory variables. This form is incorporated into modeling of new facilities and expansion of existing facilities due to the presence of heteroskedasticity. A log likelihood ratio test detected the presence of heteroskedasticity for new and expansion of existing facilities leading to a heteroskedastic Tobit being preferred relative to a standard Tobit. Estimation of a standard Tobit model concludes that non-normality is a problem only in regards to expansion of existing facilities. To correct for non-normality, the square root expansion is used as the dependent variable. LIMDEP 9.0 is used to estimate the heteroskedastic Tobit models and marginal effects.

The presence of other manufacturing establishments in a county in 1997 is only marginally significant in attracting new facilities over the 1997-2005 time period. Other studies have shown the positive effect of agglomeration of firms that draws other firms to the same area to potentially take effect of spillover effects and an available labor force. Some of these firms may be competing for a resource that is more readily available in Texas or Oklahoma relative to the rest of the U.S. whether that is natural gas or another resource. Per capita fire expenditures is positive and significant in explaining location of new facilities. ISO ratings and insurance premiums are tied to fire protection services leading to communities that have higher expenditures leading to investment. This may also be due to the threat of wildfires in both states and firms wanting to locate in areas

that will protect their investments in physical facilities. Given the prevalence of petroleum based industries in Oklahoma and Texas would also require fire protection services. This assertion is further validated by looking through the description of firms and their respective industries with many being oil or natural gas related.

Population density is only significant in explaining expansion of existing facilities. Lack of significance in the new facilities model may suggest that land costs (with population density serving as a proxy) are not a detrimental factor in firm location in Texas and Oklahoma and/or the firm believes it will be able to attract labor to fill its needs. Significance of population density in the expansion model is consistent with findings from the change in employment model suggesting that areas with higher population densities are ideal for expansion of existing facilities in included counties due to decreased costs associated with recruiting additional labor. Counties with higher proportion of persons who work outside their county of residence has a negative impact on expansions. This variable is hypothesized to have a negative impact on location of facilities suggesting a county lacks amenities despite its (lower) cost of living. Firms seeking to expand in a county with a higher proportion of persons working outside the county may be negative due to a belief that these persons prefer not to work in their county of residence. Somewhat surprisingly, the number of violent crimes in a county has a positive effect on firm location. This is counterintuitive to theory, but this could be a reflection of correlation instead of firms seeking out areas with higher crime.

Counties that are in the Texoma Regional Consortium are also significantly different from all other similarly sized counties in Texas and Oklahoma in their ability to create new jobs. Despite the TRC not being formed until the latter years of the study

period with independent variables being measured in 1997, jobs have been created in the area due to the benefits present. This includes the proximity to the Dallas/Fort Worth metroplex and relatively good infrastructure. Amenities such as Lake Texoma also likely are an additional factor that aided in firm recruitment due to the recreational activities the lake offers.

The marginal effects for the heteroskedastic tobit model are provided in Table 8. These effects are the expected change in the dependent variable given a one unit change in the independent variable. Given the differences in the units of independent variables, elasticities are provided in table 9. The marginal effects for the expansion of existing facilities (and related elasticities) have been adjusted for more meaningful interpretation.

Conclusion

Industrial recruitment and expansion has long been a focus of economic growth efforts. Growth is not solely limited to firm recruitment but also entrepreneurship which differs in the factors leading to the presence of entrepreneurs. This paper uses a heteroskedastic Tobit model to analyze factors affecting firm location in Texas and Oklahoma counties from 1997 to 2005. An additional GLS model is incorporated to determine change in employment during this time period as well.

With respect to objective 1, counties that are part of micropolitan areas are more likely to see positive growth in terms of employment as well as counties in Texas (relative to Oklahoma). Counties with longer commute times are positively linked with employment growth although concerns about this trend continuing must be raised due to the recent rapid increase in gasoline prices. The market differential variable is not significant suggesting that pull factors are not important in employment growth or

location/expansion of manufacturing facilities. The fact that higher levels of sales taxes has such a negative impact on growth is surprising, but this fact may be attributed to retail stores not locating in areas with higher sales taxes. This could be related to counties not having a sufficient market to attract retail stores to the county which results in counties having higher sales tax rates to compensate for public services including road maintenance as well as police and fire services.

With respect to objective 2, whether or not a county is micropolitan in nature has the greatest impact on new firm location (as measured through monetary size of investment, number of employees hired, or size of the facility). Counties that spend more per capita on fire services are also attractive to firms included in this study. This is a rather intriguing result of this study as insurance premiums and ISO ratings are linked to fire protection services.

The final objective is to explain the growth seen in the TRC. This can be attributed partly to the location of the consortium. The consortium is significantly different from other similarly sized counties in Texas and Oklahoma in employment growth, but not location or expansion of manufacturing facilities. It is possible that the employment growth seen from 1997 to 2005 may in the future lead to location of facilities and expansion of existing facilities as time goes by. The micropolitan nature of several of the counties in the consortium may be leading to service sector jobs (including shopping centers) that are being reflected in the finding that the TRC counties are more successful in attracting employment. Attempts to model whether Durant/Bryan County behaves differently than other counties are unsuccessful due to use of a dummy variable in a data set of this size.

Although this research does shed light on factors impacting growth in Texas and Oklahoma counties from 1997 to 2005, questions still remain about how to best measure social capital and other factors that lead to entrepreneurship and economic development. These factors are lacking from this research and would provide a better explanation of the growth seen in southeast Oklahoma. Future research should try to quantify these factors that are lacking in the current modeling efforts. The current model does not also take into account spatial proximity between county *i* and *j*. Spatial autocorrelation may be a factor that is impacting location decisions which could be corrected by including a spatial weights matrix in the estimated models. The market differential variable attempts to address this issue, but may serve as a poor proxy despite its significance in explaining percentage change in employment.

As this research uses data from 1997 to 2005, some of the growth in Oklahoma and Texas may be a result of the implementation of the North American Free Trade Agreement (NAFTA). Due to NAFTA's implementation in 1994, this would have given firms sufficient time to make location decisions that would incorporate the potential markets in Mexico and Canada. The reduced tariff rates between the U.S. and Mexico would have provided greater incentive for firms to possibly expand operations into Texas and Oklahoma rather than Canada due to the close economic ties that the U.S. and Canada have shared for many years. Texas and Oklahoma would have provided cheaper labor for firms (relative to other portions of the U.S.) without venturing into unknown laws and trade practices that are present in Mexico.

Cost of the dataset from Conway Data, Inc. is also a limiting factor. A more robust data set including other surrounding states to Texas and Oklahoma would provide more

insight into factors affecting location, expansion, and job growth. This might also produce results more consistent with theory, such as the number of violent crimes having a positive impact on location or expansion decision as well as the per capita expenditures on police services having a negative impact on employment growth. However, the heteroskedasticity that is corrected for in this model may become more severe with inclusion of other states.

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Table II-1. Sales Tax Collections for Durant, OK, for Fiscal Years 1980-2007

Year	Collections	Tax Rate	Taxable Sales
1980	$1,860,563.72	3.00%	$62,018,790.67
1981	$2,053,148.74	3.00%	$68,438,291.33
1982	$2,277,574.40	3.00%	$75,919,146.67
1983	$2,434,809.00	3.00%	$81,160,300.00
1984	$2,669,454.19	3.00%	$88,981,806.33
1985	$2,783,948.57	3.00%	$92,798,285.67
1986	$2,798,268.00	3.00%	$93,275,600.00
1987	$3,002,248.85	3.00%	$100,074,961.67
1988	$2,996,504.26	3.00%	$99,883,475.33
1989	$3,041,163.71	3.00%	$101,372,123.67
1990	$3,290,625.62	3.00%	$109,687,520.67
1991	$3,564,806.49	3.00%	$118,862,883.00
1992	$3,699,426.06	3.00%	$123,314,202.00
1993	$3,802,972.30	3.00%	$126,765,743.33
1994	$3,950,399.74	3.00%	$131,679,991.33
1995	$4,058,680.94	3.00%	$135,289,364.67
1996	$4,257,782.19	3.00%	$141,926,073.00
1997	$4,432,148.45	3.00%	$147,738,281.67
1998	$4,535,508.27	3.00%	$151,183,609.00
1999	$4,831,662.77	3.00%	$161,055,425.67
2000	$5,074,698.38	3.00%	$169,156,612.67
2001	$5,329,163.38	3.00%	$177,638,779.33
2002	$5,397,132.51	3.00%	$179,904,417.00
2003	$6,120,370.83	3.00%	$204,012,361.00
*2004[8]	$4,619,198.93	3.00%	$153,973,297.67
*2004[4]	$2,493,379.37	3.25%	$76,719,365.23
*2005[5]	$3,105,432.79	3.25%	$95,551,778.15
*2005[7]	$5,055,381.15	3.75%	$134,810,164.00
2006	$9,358,717.49	3.75%	$249,565,799.73
2007†	$10,174,773.39	3.75%	$271,327,290.40

† 2006 data have not been formally reported by the Oklahoma Tax Commission; thus data for FY 2006 should be considered preliminary.
(*) Data are for * months of the year.
Source: Brooks et al. (2008)

Table II-2. Trade Area Capture for Durant, OK, 1980-2005

Year	Trade Area Capture	Population	Pull Factor
1980	20,963	11,972	1.751
1981	19,541	12,250	1.595
1982	20,961	12,650	1.657
1983	20,856	13,100	1.592
1984	21,659	13,300	1.628
1985	22,455	13,450	1.670
1986	23,324	13,800	1.690
1987	25,622	13,600	1.884
1988	24,128	13,350	1.807
1989	23,743	13,500	1.759
1990	24,379	13,110	1.860
1991	25,259	13,005	1.942
1992	25,308	12,990	1.948
1993	25,406	13,093	1.940
1994	24,468	12,988	1.884
1995	24,079	13,050	1.845
1996	23,819	12,966	1.837
1997	24,281	13,051	1.860
1998	24,172	13,044	1.853
1999	24,324	12,992	1.872
2000	24,603	14,200	1.733
2001	24,213	14,204	1.705
2002	24,642	14,250	1.729
2003	28,533	14,565	1.959
2004	29,731	14,780	2.012
2005†	28,641	14,710	1.947

† Values for 2005, 2006 and 2007 should be considered preliminary since they rely on 2004 BEA data.

Source: Brooks et al. (2008)

Table II-3. Summary Statistics for Independent Variables

Variable	Description	Mean	Standard Deviation	Expected Sign
POP[a]	Population density (persons/sq mile)	21.210	24.258	(+)
INCOME[b]	Per capita personal income in thousands	18.421	3.917	(+)
MDV	The difference in income (in thousands) between county *i* and nearest MSA divided by distance	-0.059	0.088	(+)
COMMUTE[c]	Average commute time	22.782	5.314	(-)
PCTOUT[c]	Percent of workforce that works outside county *i*	30.787	14.746	(-)
ROAD[a]	Road mileage divided by county land area	0.043	0.031	(+)
MFG[a]	Number of manufacturing establishments in county *i*	18.257	18.481	(+)
SALESTAX[d,e]	Sales tax in the county as a percentage	7.890	0.589	(+)
PROPERTY[a]	Per capita property taxes in 1997 (in thousands)	1.011	1.581	(-)
FIRE[a]	Per capita expenditures on fire services	21.963	19.653	(+)
POLICE[a]	Per capita expenditures on police services	87.029	124.162	(-)
EDUCATION[a]	Per pupil spending on education in thousands	7.069	4.881	(+)
CRIME[a]	Violent crimes per thousand persons	2.815	1.702	(-)
METRO[f]	County is part of a MSA (2000)	0.151	0.359	(-)
MICRO[f]	County is defined as a micropolitan county (2000)	0.189	0.392	(+)
TX	County *i* is located in Texas	0.755	0.431	(+)
OK	County *i* is located in Oklahoma	0.245	0.431	
TRC	County *i* is a member of the Texoma Regional Consortium	0.045	0.208	(+)

[a] USA Counties website, U.S. Census Bureau: http://censtats.census.gov/usa/usa.shtml
[b] BEA REIS
[c] U.S. Census Bureau
[d] Oklahoma data provided by the Oklahoma Cooperative Extension Service, unpublished
[e] Texas data provided by the Texas Comptrollers' Office
[f] U.S. Census Bureau, 2000 Census

Table II-4. Correlation Coefficient for Dependent and Independent Variables

	NEW	*EXPANSION*	*%ΔEMPLY*	*POP*	*INCOME*	*MDV*	*COMMUTE*	*PCTOUT*
NEW	1.000							
EXPANSION	0.551	1.000						
%ΔEMPLY	0.089	0.009	1.000					
POP	0.626	0.498	0.263	1.000				
INCOME	0.151	0.085	-0.088	0.148	1.000			
MDV	0.024	-0.003	-0.096	-0.050	0.601	1.000		
COMMUTE	0.073	0.056	0.405	0.344	-0.149	-0.296	1.000	
PCTOUT	-0.028	-0.108	0.277	0.253	0.037	-0.214	0.739	1.000
ROAD	0.412	0.463	0.171	0.565	0.043	-0.050	0.205	0.081
MFG	0.487	0.555	0.152	0.617	0.103	-0.102	0.285	0.033
SALESTAX	0.089	0.086	-0.014	0.223	-0.082	-0.126	0.233	0.113
PROPERTY	-0.136	-0.133	0.040	-0.188	0.310	0.251	-0.190	-0.101
FIRE	0.209	0.254	-0.137	0.120	0.067	0.049	-0.285	-0.332
POLICE	-0.015	-0.005	-0.181	-0.065	0.463	0.345	-0.172	-0.132
EDUCATION	-0.052	-0.020	0.044	-0.048	-0.107	-0.094	-0.113	-0.104
CRIME	0.161	0.242	-0.056	0.224	-0.121	-0.048	-0.010	-0.108
METRO	0.020	0.033	0.167	0.295	0.071	-0.178	0.412	0.081
MICRO	0.300	0.400	0.019	0.265	0.032	0.025	-0.182	0.635
TX	-0.209	-0.099	0.131	-0.109	0.160	0.141	0.010	-0.338
OK	0.209	0.099	-0.131	0.109	-0.160	-0.141	-0.010	-0.013
TRC	0.135	0.043	0.054	0.087	-0.108	-0.078	0.071	0.013

Table II-4. Cont.

	ROAD	*MFG*	*SALESTAX*	*PROPERTY*	*FIRE*	*POLICE*	*EDUCATION*	*CRIME*
ROAD	1.000							
MFG	0.495	1.000						
SALESTAX	0.264	0.234	1.000					
PROPERTY	-0.196	-0.267	-0.427	1.000				
FIRE	0.073	0.254	-0.040	0.044	1.000			
POLICE	-0.093	-0.086	-0.234	0.606	0.187	1.000		
EDUCATION	-0.049	-0.043	-0.101	0.121	-0.012	-0.073	1.000	
CRIME	0.246	0.301	0.188	-0.187	0.174	-0.088	0.063	1.000
METRO	0.167	0.120	0.097	-0.099	-0.142	-0.051	-0.062	-0.030
MICRO	0.228	0.377	0.006	0.001	0.344	0.010	0.137	0.306
TX	-0.161	-0.116	-0.264	0.245	-0.059	0.112	0.148	-0.076
OK	0.161	0.116	0.264	-0.245	0.059	-0.112	-0.148	0.076
TRC	0.123	0.117	0.103	-0.097	0.012	-0.041	-0.080	0.025

Table II-4. Cont.

	METRO	*MICRO*	*TX*	*OK*	*TRC*
METRO	1.000				
MICRO	-0.203	1.000			
TX	-0.005	-0.017	1.000		
OK	0.005	0.017	-1.000	1.000	
TRC	-0.092	0.173	-0.298	0.298	1.000

Table II-5. GLS Estimates of Change in Employment[a]

Variable	Parameter Estimate
Intercept	0.1636
	(0.1079)
POP	0.0015***
	(0.0002)
INCOME	-0.0076***
	(0.0026)
MDV	0.0253
	(0.0995)
COMMUTE	0.0116***
	(0.0023)
PCTOUT	-0.0008
	(0.0008)
ROAD	0.5796***
	(0.1968)
MFG	-0.4129
	(0.4355)
SALESTAX	-0.0258**
	(0.0119)
PROPERTY	0.0054
	(0.0111)
FIRE	0.0001
	(0.0004)
POLICE	-0.0002***
	(0.0001)
EDUCATION	0.0018***
	(0.0005)
CRIME	-0.0211***
	(0.0032)
METRO	0.0252
	(0.0200)
MICRO	0.0379**
	(0.0183)
Texas	0.0640***
	(0.0153)
TRC	0.0579***
	(0.0198)
Log Likelihood Value	-340.155

Note: *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.
Standard errors in parentheses.
[a] The variance equation is the exponential of all independent variables. The dependent variable is percentage change in employment expressed as a decimal.

Table II-6. Empirical Estimates of Tobit Models for New Facilities, Expansion of Existing Facilities, and Combined Facilities

Variable	Model type	
	New Facilities	Expansion of Facilities[a]
Intercept	-7.158*	-2.782
	(4.145)	(2.234)
POP	0.031	0.036***
	(0.019)	(0.010)
INCOME	0.104	0.038
	(0.095)	(0.047)
MDV	-0.742	-0.364
	(3.624)	(1.860)
COMMUTE	0.062	0.040
	(0.071)	(0.036)
PCTOUT	0.021	-0.024*
	(0.024)	(-0.024)
ROAD	-6.396	5.350
	(6.983)	(4.597)
MFG	0.028*	0.002
	(0.016)	(0.006)
SALESTAX	0.148	0.053
	(0.398)	(0.232)
PROPERTY	-0.209	-0.011
	(0.440)	(0.331)
FIRE	0.025***	0.008
	(0.008)	(0.007)
POLICE	0.004	0.000
	(0.008)	(0.003)
EDUCATION	0.015	0.005
	(0.021)	(0.030)
CRIME	0.179*	0.067
	(0.101)	(0.071)
METRO	-1.457*	0.203
	(0.834)	(0.307)
MICRO	1.362**	0.483*
	(0.586)	(0.286)
Texas	-1.842***	-0.128
	(0.451)	(0.253)
TRC	0.741	-0.543
	(0.554)	(0.376)
σ	1.097	2.451
	(3.205)	(5.616)
Log Likelihood	-263.355	-223.523

[a] A square root transformation is used on expansion of existing facilities to impose normality.
Note: *, **, and *** denote significance at the 10%, 5%, and 1%, respectively with standard errors shown in parentheses.

Table II-7. Heteroskedastic Terms for Tobit Models for New Facilities, Expansion of Existing Facilities, and Combined Facilities[a]

	Model type	
Variable	New Facilities	Expansion of Facilities
POP	0.012**	0.015
	(0.006)	(0.005)
INCOME	0.037	0.084*
	(0.057)	(0.048)
MDV	-1.869	-1.672
	(2.525)	(1.490)
COMMUTE	-0.027	-0.036
	(0.050)	(0.037)
PCTOUT	-0.019	0.018
	(0.020)	(0.016)
ROAD	5.284	7.337*
	(5.307)	(4.338)
MFG	-0.002	-0.023***
	(0.009)	(0.008)
SALESTAX	0.159	-0.221
	(0.280)	(0.215)
PROPERTY	-0.269	-1.229***
	(0.343)	(0.223)
FIRE	-0.018***	-0.006
	(0.006)	(0.006)
POLICE	0.005	0.005
	(0.005)	(0.004)
EDUCATION	-0.072	0.012
	(0.048)	(0.033)
CRIME	-0.122*	-0.159**
	(0.074)	(0.071)
METRO	0.217	-0.667
	(0.594)	(0.435)
MICRO	-0.499	0.156
	(0.330)	(0.355)
Texas	0.593*	0.632**
	(0.303)	(0.262)
TRC	-0.134	-0.598
	(0.516)	(0.830)

Note: *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.
Standard errors are shown in parentheses.
[a] The estimates presented in this table are the parameter estimates of the variance equation of the heteroskedastic tobit model.

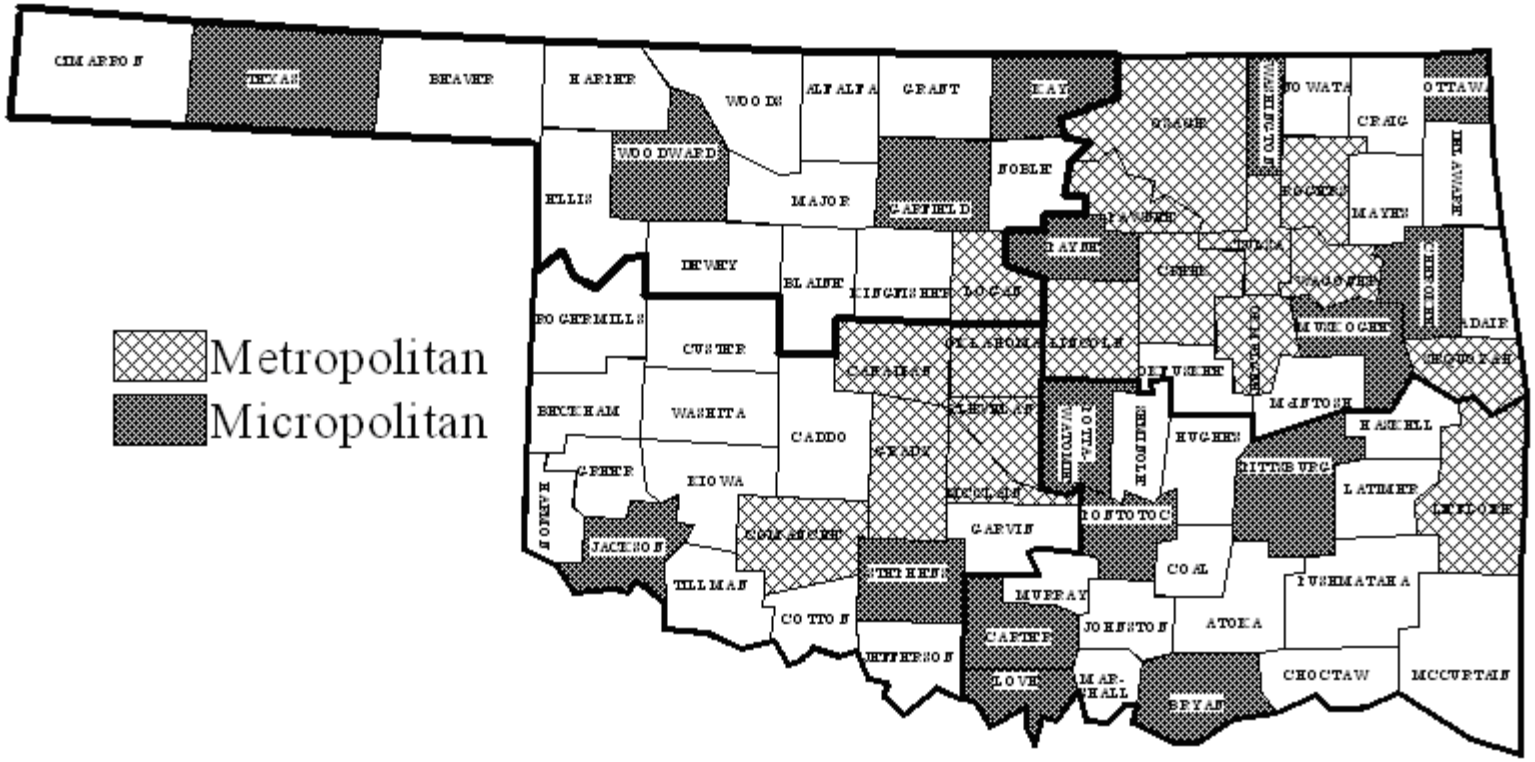
Table II-8. Marginal Effects Estimated by the Heteroskedastic Tobit Model for the Combined Effects on New Facilities, Expansion of Existing Facilities, and Combined Facilities

	Model type	
Variable	New Facilities	Expansion of Facilities
POP	0.018	0.023
INCOME	0.057	0.048
MDV	-1.532	-0.762
COMMUTE	0.000	0.007
PCTOUT	-0.007	-0.006
ROAD	1.784	5.188
MFG	0.007	-0.007
SALESTAX	0.156	-0.051
PROPERTY	-0.251	-0.434
FIRE	-0.005	0.002
POLICE	0.005	0.002
EDUCATION	-0.046	0.007
CRIME	-0.032	-0.022

Note: Combined refers to the sum of the marginal effect for the variables in the heteroskedastic tobit and variance equations

Table II-9 Estimated Elasticities for the Combined Effects on New Facilities, and Expansion of Existing Facilities

	Model type	
Variable	New Facilities	Expansion of Facilities
POP	0.781	2.084
INCOME	2.28	1.948
MDV	0.052	0.059
COMMUTE	1.673	2.526
PCTOUT	0.764	-2.040
ROAD	-0.327	0.633
MFG	0.614	0.115
SALESTAX	1.387	1.144
PROPERTY	-0.251	-0.030
FIRE	0.659	0.494
POLICE	0.451	0.040
EDUCATION	0.123	0.106
CRIME	0.600	0.522



Source: Office of Management and Budget, Released June 2003

Figure II-1. Metropolitan and Micropolitan Counties in Oklahoma

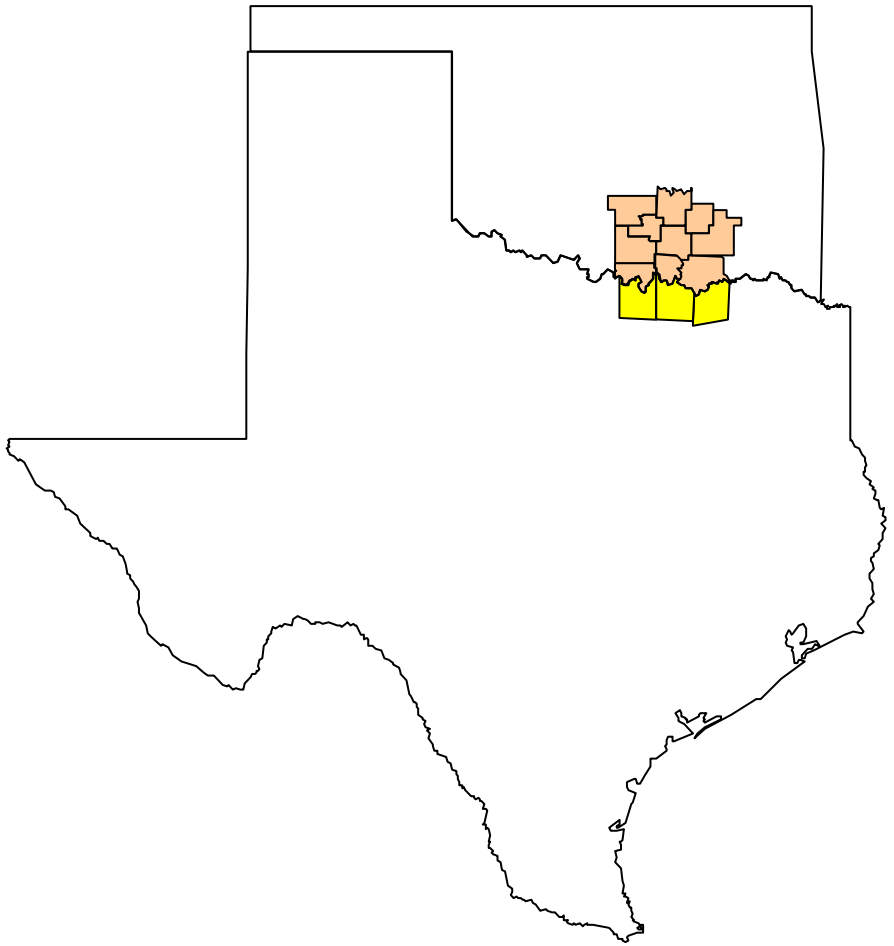


Figure II-2. Location of the Texoma Regional Consortium in Texas and Oklahoma

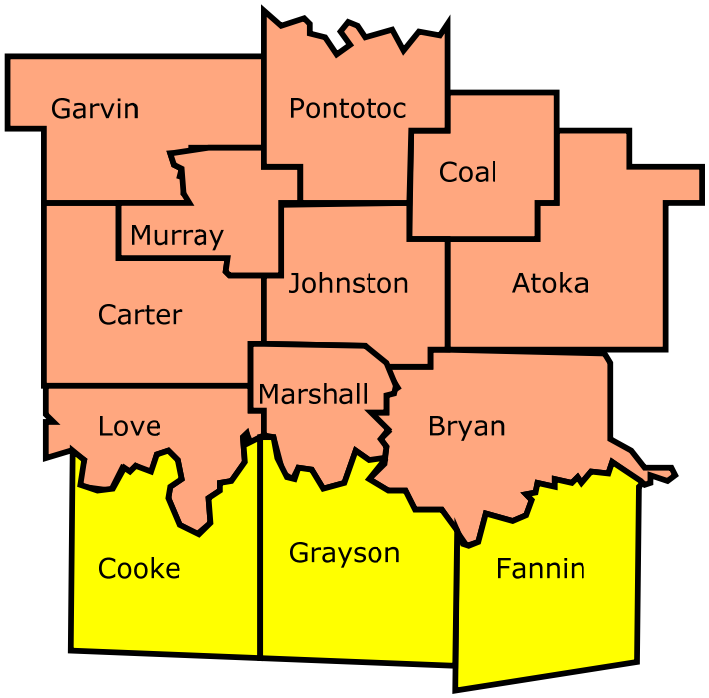


Figure II-3. Oklahoma and Texas Counties Participating in the Texoma Regional Consortium

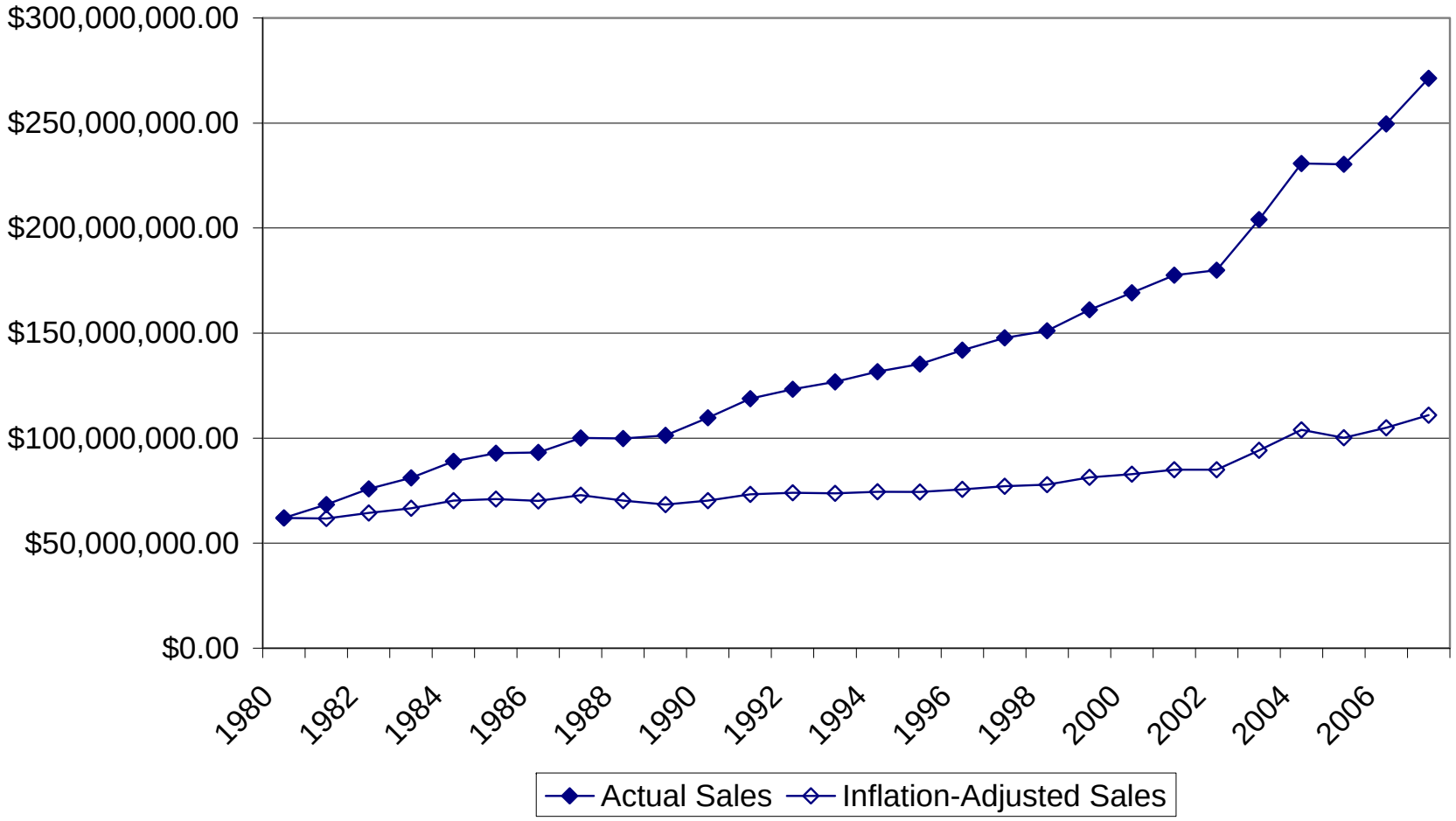


Figure II-4. Estimated Retail Sales for Durant, OK, FY 1980-2007: Actual and Inflation Adjusted
Source: Brooks et al. (2008)

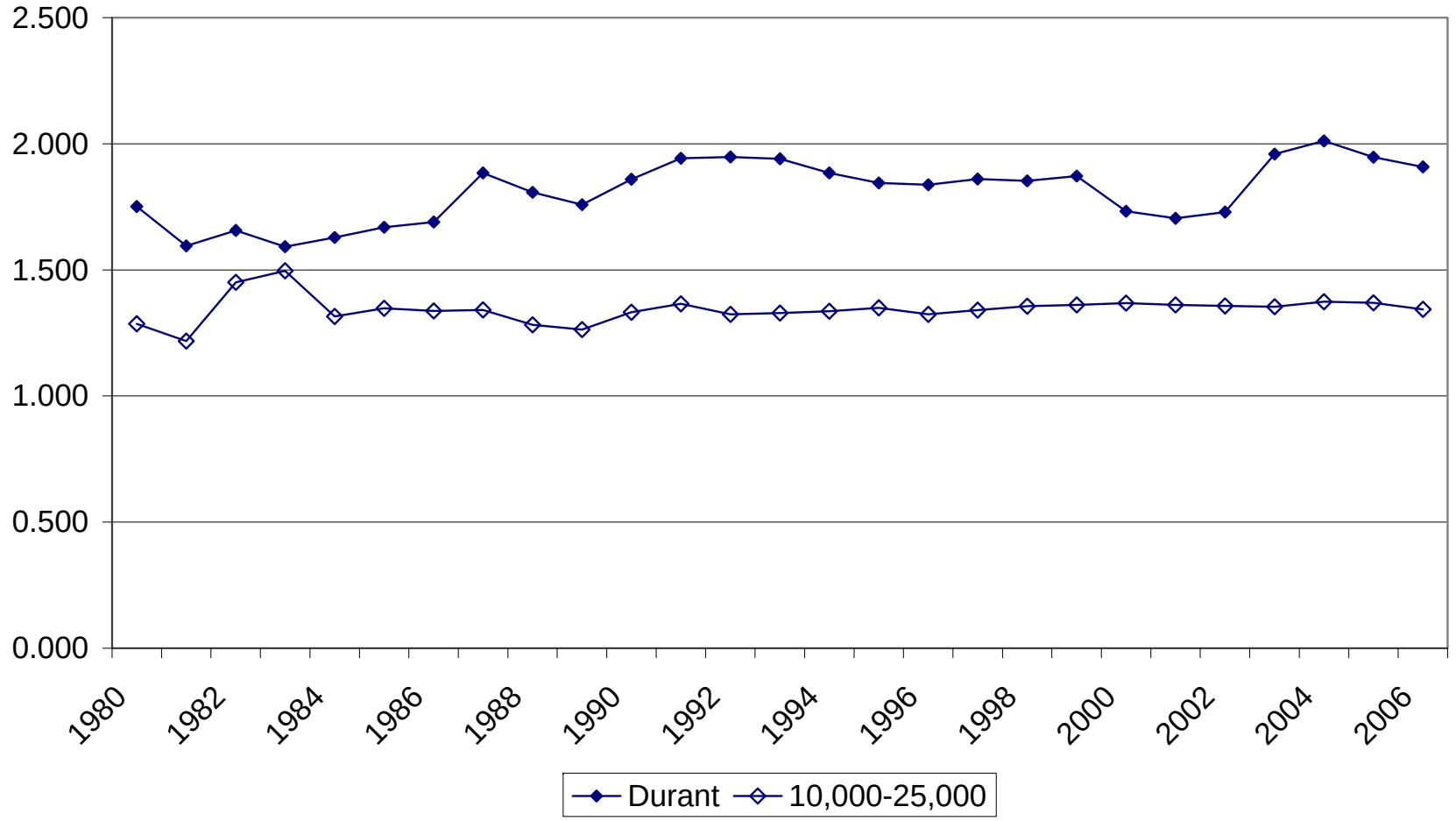


Figure II-5. Pull Factor Durant, OK, and OK Cities with Populations between 10,000 and 25,000
Source: Brooks et al. (2008)

CHAPTER III

THE ROLE OF STUDENT EVALUATIONS OF TEACHING IN THE UNIVERSITY CLASSROOM

Introduction

The practice of students evaluating courses and instructors has a long and controversial history at U.S. universities. Because of instructor's concern over the use of student evaluations of teaching (SET) in faculty evaluations (Whitworth, Price, and Randall 2002) considerable research has focused on testing the validity of SET. It is possible that students' impressions of a class or instructor are formed prior to the class. If student expectations of a course and instructor are developed prior to engagement in the course and these expectations affect learning, then identifying and understanding the factors involved in setting these expectations can improve instruction and student learning.

One significant question that has yet to be addressed fully in the literature is what factors drive students' pre-impressions of a course. What sources of information are students using to form initial opinions aside from the actual course experience and their interaction with the instructor? How do pre-impressions impact students' rating of a course and instructor at the end of the class? Fleming, Bazen, and Wetzstein (2005) measure the externalities (including class standing of the student, whether the class is required for the student's major, day the class meets, how often the class meets, and time

of the course) associated with SET but their results mask what occurs in the first few moments of a course when first impressions are made. Such externalities tie into the idea of "consumerism" which has recently appeared in the SET literature. The idea of consumerism stems from students evaluating courses on characteristics that are not associated with instructional value. Consumer characteristics would include factors like the price of the textbook, date/time the course meets, and entertainment value. To the extent that consumerism influences evaluations, course/instructor ratings could be biased and would indicate less about class content or the instructors' teaching capacity.

In addition to identifying factors that affect students' initial impressions, it is important to know whether the impressions are lasting or change during a class. If student opinions of instructors are determined during the first course meeting or meetings, then SET are less valuable as a tool to evaluate faculty for review, promotion, and tenure decisions. These opinions can be formed from a myriad of sources such as rumors, reputation, and a student's previous experience with the instructor, however brief. Rumors and reputations may be externalities as faculty have "limited direct influence" (Fleming, Bazen, and Wetzstein 2005). Merritt (2008) explores some of these biases present in a student's mind through a meta-analysis of the literature that lasting opinions are formed in the first five minutes in the presence of an instructor.

Problem Statement

Given the amount of information available to students on courses from all available sources (including previous experiences, internet websites, friends, and faculty advisors), students may know within in the first few meetings of a course how they will rate the instructor and course. Much time and effort is spent by instructors in order to maintain

high instructional ratings at institutions where SET are a component of review, promotion, and tenure decisions. Merritt (2008) documents that a student's lasting impressions of instructors are formed within the first five minutes of contact with an instructor. These findings are attributed to the instructor's gender, facial attributes, and mannerisms, and underscore why the literature is clear that SET should not be the only measure of teaching ability despite the validity of SET (McKeachie 1997). Much time, effort, and cost are associated with the printing, collection, analyzing, and, in some cases, teaching with the SET in mind. However, students may also form opinions of the course throughout the semester which are reflected on the SET conducted at the end of the semester.

Students pass on information regarding courses and instructors to fellow students. This allows the student to form expectations/pre-impressions of a course or instructor. Kohlan (1973) acknowledges the presence of hearsay information that is available to students which biases student opinions prior to actual interaction with the instructor or course. From time to time, a student's academic advisor may also make suggestions on possible instructors based on information conveyed to him/her by previous advisees. In essence, the student is gathering information prior to "buying the good/service", i.e. the educational experience in a given course taught by an instructor. Furthermore, the student may be trying to minimize buyer's remorse.

An additional tool that has served the purpose of providing information to students are internet websites that allow instructors to be rated and the information is shared. While it is not known how widely these websites affect the decision on which instructors (courses) a student chooses to take, available information would play a role

into the formation of pre-impressions the student has about the instructor and course. Questions exist about the lack of quality control in such websites that students may or may not fully understand. Many of these websites allow for students to view each individual rating and associated comments in addition to aggregating the ratings provided by students. While this may increase the quantity of information, the question of whether or not web-based internet evaluations are based on a valid sample remains. In the College of Agricultural Sciences and Natural Resources at Oklahoma State University, information students gain from a website may not affect the choice decision itself, but would affect observed SET ratings due to the fact many courses only have one section available each semester.[1] In instances in which a course is taught by two different professors in different semesters, students may delay enrollment in a course until an instructor perceived to be more favorable is available in an effort maximize the student's expected utility derived from the course experience.

Objectives

The objectives of this chapter are:

1) To determine the factors that most impact course and instructor appraisal at the beginning of the semester.

a. To evaluate if gender of the student or instructor affects initial impressions of a course/instructor.

2) To evaluate the importance of outside sources of information impact students' evaluation of instructors and courses in the first two weeks of the semester.

[1] A few introductory level courses have multiple sections that are taught by a single professor in a large lecture style room. These lectures are supplemented by laboratory/discussion sessions where students meet within their smaller section.

3) To determine if initial impressions of instructors and courses are lasting throughout a semester.

a. To evaluate the factors that are most important in leading to the variability of course and instructor evaluations over the course of the semester.

b. To determine if students who evaluate instructors and courses twice in a semester anchor their responses relative to students who evaluate instructors once in a semester.

c. To determine the importance of grade expectations in the variability of course/instructor evaluation scores.

Literature Review

The role of students' evaluations as measures of instructor effectiveness is frequently debated amongst faculty in the United States. According to Wilson (1998), there are nearly 2000 studies in this area, as its one of the most extensively researched areas in higher education. Much of the debate is due to the suitability of SET as a tool in review, promotion, and tenure decisions. Studies have examined the link between grade inflation and SET (Germain and Scandura 2005), to how response rates and evaluations differ from an in-class setting and online evaluation (Dommeyer, Baum, Hanna, and Champman, 2004). As Whitworth, Price, and Randall (2002) state, there are two major concern areas for evaluations: what the evaluation actually measures and administrators' use of a single measure (i.e. question) from the SET. If administrators use SET questions to measure faculty members' effectiveness as teachers, then faculty have a stake in the evaluations which can be easily affected by responses from a few students. Articles by

Wilson (1998) and Hilt (2001) that appear in *The Chronicle of Higher Education* are two of many articles that document what happens to faculty members that receive poor evaluations.

A key argument against the use of SET as a measure of teaching effectiveness is that students do not have adequate *a priori* knowledge to critique instruction until after having been in the workforce for several years (Theall and Franklin, 2001). This argument is dismissed by Costin, Greenough, and Menges (1971) who point out that student ratings are stable across several years where fellow faculty members' evaluations of teaching are not. As Theall and Franklin (2001) point out, students are there and have experienced the full course experience. The research provided in Fleming, Bazen, and Wetzstein (2005) is particularly informative and suggests the impact of externalities (e.g. class time, size, and schedule) on SET scores. One of the research findings suggests that upperclassmen may resent taking introductory agricultural courses. Merritt (2008) and Widmeyer and Loy (1998) also find that externalities such as appearance and descriptions of the instructor have a direct impact on SET scores.

Wetzstein, Broder, and Wilson (1984) analyze what students thought of their instructors and courses in introductory macroeconomics and intermediate microeconomics. The evaluation in this study is conducted on the first day of class (prior to discussion of the course content) as well as the end of the term. Using a Bayesian method, the authors correct for the reputation of the professor in the microeconomics course and demonstrate that the graduate student may have performed better in the macroeconomics course than the professor in the microeconomics course. This result is

not immediately apparent given the unadjusted results which suggest both instructors performed at the same level.

Other studies have administered evaluation questionnaires in the early stages of the semester as well as the more traditional end of semester evaluation. Kohlan (1973) administers evaluations in selected classes at the end of the second class hour and again during the last week of the semester. Results of the study find that evaluations conducted early in the semester are stable across the semester. Kohlan (1973) suggests this may be due to the fact that little new information regarding the ability of the instructor is presented after the first few classes and underlines the importance of positive early impressions.

Whitworth, Price, and Randall (2002) find that instructor's gender did affect the quality ratings received and that course evaluations cannot be compared across course category. The implication of the latter hypothesis is that comparisons cannot be made across different business disciplines and levels of the course (e.g. graduate versus undergraduate or lower division courses and upper division courses). They conclude that administrators should refrain from comparing one instructor to another. McKeachie (1997) further validates this conclusion with the finding that student evaluations in lower level courses have lower validity than do evaluations in upper level courses. Germain and Scandura (2005) also call into question the construct validity of SET and discuss its relevance in greater detail. Furthermore, McKeachie (1979) concludes that evaluations have been linked to students' course grades. If this does occur, not only is the criterion contaminated as suggested by McKeachie (1979), but calls into question the timing of the evaluations. Simply put, there may not be an ideal time for student evaluations to occur.

Development of a tool to account for grade inflation present in SET scores would increase validity, but would be difficult to apply in practice, given that evaluations can not necessarily be compared across courses, instructors, or years.

A limited number of studies have focused on timing of the actual evaluation instrument. However, these studies (Frey, 1976; Witt and Burdalski, 2003) have supported the effectiveness of the SET at the end of the semester. Frey (1976) divides students of introductory calculus classes into two subsets with one group evaluating the instructor prior to end of the term and the other half during the first week of the subsequent term, with the conclusion being that the results were "not reliably different." That finding helps to explain why SET scores are consistent across time, i.e. students who are asked about the course a few years later feel the same as they did at the conclusion of the course (Costin, Greenough, and Menges 1971). Witt and Burdalski (2003) administer SET during the eleventh week of a fourteen week term with a follow-up evaluation on the last day. Results included significant differences in the evaluation of the instructor's ability to allow students to express their ideas and ask questions, communication skills and knowledge of the instructor, and the clarity of course objectives. Students in this study self-report that opinions are no worse at the end of the semester although in the actual evaluation responses there are negative changes. Such findings do raise the question of whether students knowingly or unknowingly anchor their responses when given the same survey at different points in the semester. Anchoring is defined as answering a question consistently across the semester.

Bejar and Doyle (1976) conduct an evaluation at the beginning and end of a summer semester. Initial evaluations are conducted on the first day of the course prior to

the students seeing the instructors, with none of the 76 participating students knowing the identity of the instructor. Use of factor analysis showed that students were able to separate their expectations from the evaluations. However, the structures of the measured expectations and final evaluations are similar. Bejar and Doyle (1976) state this relationship might be the result of the learning process from previous instructors which is similar to McKeachie's (1997) statement regarding the lower validity of evaluations in lower division courses due to lack of a broad educational experience. Additionally, Bejar and Doyle (1976) note that the fact this research is conducted in the summer term might lead to more or less homogenous results compared to a regular semester.

Remedios and Lieberman (2008) also document expectations of students and compare results from before and after the semester among approximately six hundred students who enrolled in psychology courses at a Scottish university. Students are asked to complete the questionnaire prior to registering for classes with the follow-up questionnaire being given during enrollment for the following term. Findings included grades, study hours, and perceived difficulty did have a marginally small impact on ratings. Courses where students feel involved including being stimulating, interesting, and useful largely determined course ratings (Remedios and Lieberman 2008). Remedios and Lieberman (2008) also find students are sensitive to different qualities of courses and are not likely to rate all aspects highly if one area of the course is rated highly.

Conceptual Model

At Oklahoma State University (OSU), students evaluate their instructor as well as the course on several different factors in each category which are shown in the appendices to this chapter. Merritt (2008) suggests that students form expectations (opinions) of both

course and instructor prior to the first day of class or within the first meetings. These expectations may be formed from other students, websites, professors, and/or advisors in addition to the student's own prior interaction with the instructor.

First Impressions Methodology

While students may not always be knowledgeable about the subject matter of the course in which they enroll, they may have an idea of how the course is going to unfold over the course of the semester given events early in the semester and early impressions of the instructor. The description of an instructor can impact evaluations as outlined in the paper by Widmeyer and Loy (1988) who describes a guest lecturer as either a "rather warm (cold) person". Those students who receive the "warm" descriptor rate the guest lecturer as more intelligent and interesting than those students who receive the "cold" descriptor. One drawback of the evaluation procedure which is outlined in the current research is that students are forced to choose a way they view their instructor early in the semester unlike the course attributes which allow a student to pick "not applicable" or "undecided" in regards to a statement on the SET. However, it can be argued that students already have an opinion on instructors early in the semester based on whether or not the student continues to stay enrolled in a course and conversations they may have with friends and family about the courses and instructors they are currently taking (let alone by enrolling in the course). Granted, the previous statement is a tad simplistic, but enrollment in a course is a revealed preference of the student that the current instructor/course is better than the alternative of waiting to possibly have a different instructor or the course not being offered again for several semesters causing the student to continue their education until the next offering of the course.

Conducting a SET in the first few meetings of a course can be viewed as a student expressing their expectations of utility from the knowledge gained from the course throughout the semester

(1) E[*U(Student, Instructor, Course, Student Views)]*,

where *Student* is a vector that includes characteristics of the student such as gender, classification, and previous courses in the subject matter, *Instructor* is a vector of variables including the rank of the instructor and perceptions about the instructor's attitude and presentation of the material, *Course* is a vector of variables related to size of the class, time the course meets, and perceptions about the workload, and *Student Views* is a vector containing information about student's expected grade and attendance, views on how fair the instructor is, and how entertaining the instructor is. Externalities that are beyond the student's control may be found in the *Course* and *Student Views* vectors. Students rate concepts related to the instructor as "very high, high, average, low, or very low". Questions regarding the course are evaluated as "definitely yes, yes, undecided, no, definitely no, or not applicable".

The OSU evaluation instrument contains questions eliciting evaluations of both the instructor and the course. Students may be able to distinguish a good instructor even though they did not think it is a good course and vice versa. It is hypothesized that overall instructor evaluations (*InstrOverall*) are related to the evaluations of the instructor characteristics. That is,

(2) *InstrOverall = f*(*Prep*, *TeachEffort, Present, Knowledge, Explain, Attitude*)

where *InstrOverall* is the overall instructor appraisal, *Prep* is the preparation and effort, *TeachEffort* is the effort devoted to teaching, *Present* is the presentation of material,

Knowledge is knowledge of subjects, *Explain* is the ability to explain subject matters, and *Attitude* is a positive attitude toward students. Similarly, it is hypothesized that overall course evaluations are related to the evaluations of the individual evaluations of course characteristics,

(3) $CourseOverall = f(Workload, Assignments, Tests, Involve, Worthwhile)$

where *CourseOverall* is the overall course appraisal (defined as this is a good course), *Workload* is a course workload appropriate for the hours of credit, *Assignments* represents useful and relevant assignments, *Test* is whether testing and evaluations procedures are good, *Involve* is whether students are adequately involved, and *Worthwhile* is whether the course is worthwhile to the student. Although each of the independent variables in equations 1 and 2 could be a dependent variable, the questions related directly to the instructor (*Prep, TeachEffort, Present, Knowledge, Explain,* and *Attitude*) are asked and presumably answered prior to the question regarding overall instructor appraisal (*InstrOverall*) with a similar pattern with the course related variables. Estimation of a model using *InstrOverall* (*CourseOverall*) as the dependent variable with the corresponding variables mentioned above would lead to determination of those factors which students see as most important to determining overall instructor (course) appraisal in the first two weeks of a semester. The ordered nature of responses lends itself to the estimation of an ordered probit model due to the intensity of agreement (or disagreement) that students respond to a question.

Factors found to be most important in determining students' overall initial evaluations of *InstrOverall* and *CourseOverall* are hypothesized to be related to variables including whether the student is in the college of agriculture (*College)*, class standing of

the student (*Class)*, whether the course is required (*Required*), and the gender of the student evaluating the the gender of the instructor (*Male Evaluating Male, Female Evaluating Male, Male Evaluating Female, or Female Evaluating Female*). More specifically,

(4) $Y = f$(*College, Class, Purpose, Required, Type, PrevCourse, PrevInstr, Ratings, CourseValue, Male Evaluating Male, Female Evaluating Male, Male Evaluating Female, Female Evaluating Female, Graduate Instructor, Assistant Professor, Associate Professor, Full Professor, Class size, Time, Day, TeachStyle, OneSection, FriendRec, WebRec, ProfRec, SubInterest, Goodgrade, Syllabus, ActiveInvolve, Entertain, Ask, Answer, Fair, CalledOn, Focus, Visualaids, Stories, Classroom, Distract, ExpAttendance, ExpGrade)*

where *Y* is either an instructor related variable (*Prep, TeachEffort, Present, Knowledge, Explain,* or *Attitude*) or a course related variable (*Workload, Assignments, Tests, Involve, Worthwhile)*, *College* is whether or not the student is in the College of Agricultural Sciences and Natural Resources, *Class* is the class standing of the student, *Purpose* is the purpose for taking the course, *Required* is whether or not the course is required, *Type* is the type of course (lecture, lab, short course), *PrevCourse* is whether or not the student has previously had a course in the subject before, *PrevInstr* is whether or not the student has previously had the instructor, *Ratings* is whether students give lower ratings to instructors who require a lot of work, *CourseValue* is whether courses that require a lot of work are more valuable than courses that do not, *Male Evaluating Male, Female Evaluating Male, Male Evaluating Female,* and *Female Evaluating Female* refer to the

gender of the student who is evaluating the gender instructor, *Graduate Instructor, Assistant Professor, Associate Professor, and Full Professor* refer to the instructor's rank, *Class size* is the size of the class, *Time* is whether the course meets in morning or afternoon, *Day* represents the day on which the initial evaluation took place, *TeachStyle* is whether the student signed up for the course because he/she likes the teaching style of the professor, *OneSection* is whether the student enrolls because the course is required and only one section is available, *FriendRec* is whether the professor is recommended by a friend, *WebRec* is whether the professor is recommended by a website, *ProfRec* is whether the professor is recommended by another professor, *SubInterest* is whether the student enrolled in the course because the subject is of interest, *GoodGrade* is whether the student thought it would be easy to make a good grade, *Syllabus* is the degree to which the course experience is accurately reflected in the syllabus, *ActiveInvolve* is whether the instructor is able to actively involve the student in class, *Entertain* is whether the instructor is entertaining, *Ask* is whether the student does not like to ask questions during class time, *Answer* is whether the student does not like to answer questions during class time, *Fair* is whether the instructor is viewed as fair, *CalledOn* is whether the student likes to be called on during class time, *Focus* refers to whether the student is able to maintain focus in class, *Visualaids* is whether students' learning is aided by charts, graphs, and presentations, *Stories* is whether learning is aided by stories, games, and real world applications, *Classroom* is whether the classroom negatively impacts student perceptions of the course and instructor, *Distract* is whether other students negatively impact perceptions of the course, *ExpAttendance* is the expected number of classes the student will miss, and *ExpGrade* is the expected grade the student expects to achieve.

Entire Semester Comparison

The methodology for the entire semester comparison draws upon the methodology outlined in the previous section. Actual experiences in the classroom may or may not alter the student's expected utility from the course experience and performance of the instructor (overall instructor appraisal). No change in scores would reflect that information gleaned from the rumor mill or first impressions of the instructor/course is consistent with the actual experiences from the course and interactions of the student with the instructor, that is the $E(U_{initial}) = E(U_{final})$. Additional information from the actual course experience would alter the information gained from sources other than the student's actual experience. This would be reflected in an individual student's SET scores for an instructor which could be compared to his/her evaluation from the beginning of the semester. It is hypothesized that students do not change their minds about courses and instructors over the course of the semester. More succinctly,

(5) $\Delta E(U) = E(U_{final}) - E(U_{initial}) = 0$

where $E(U_{final})$ is the expected utility based on information from the final evaluation instrument and $E(U_{initial})$ is the expected utility based on responses from the initial evaluation instrument. The expected utility is observed through ratings of the overall instructor appraisal (*InstrOverall*) as well as if the student viewed the course as a good course (*CourseOverall*).

Students have three options regarding their opinions on *InstrOverall* and *CourseOverall* across the semester: increase, decrease, or no change. Variability (or lack thereof) in *InstrOverall* and *CourseOverall* is hypothesized to be a function of instructor related variables (*Prep, TeachEffort, Present, Knowledge, Explain, Attitude, Workload,*

Assignments, Tests, Involved, and *Worthwhile*) for *InstrOverall* and *CourseOverall*. The probability that a student will choose option *j* (increase appraisal, decrease appraisal, or no change in appraisal) can be calculated by

(6) Prob (choice j) = $\frac{e^{V_j}}{\sum e^{V}}$

where $V_j = XB$ is vector of appropriate independent variables, as listed in the preceding paragraph, for the model (*CourseOverall* or *InstrOverall)* and their associated parameter estimates. Each student is expected to express their expected utility so that the probability of

(7) Prob ($E(U)_i > E(U)_{no\ change}$)

where *i* is either a positive or negative change in course/instructor appraisal.

The independent variables in these models are able to vary between positive and negative four due to each variable being collected on a zero to four point scale at the beginning and end of the semester. The change in the rating given by an instructor is calculated by subtracting the initial response from the final response. Only the variables previously mentioned in this section are included to determine the factors that affect the changes in instructor or course appraisal that are recorded in an attempt to identify the factors that most directly impact changes in instructor or course appraisal over the course, if changes do in fact occur. This is consistent with the framework set forth in the initial impressions section to isolate the factors that students identify as most important in performance of the instructor (*InstrOverall*) and whether or not the course is viewed as a good course (*CourseOverall*).

The instructor and course related variables that are significant in leading to changes in instructor and course appraisal are hypothesized to be affected by the change

in other collected variables. Variables related to the student will not change over the course of the semester (i.e. a student will continue to be a student in the college of agriculture, the course will be continue to be required, etc.). Future research should address whether these omitted characteristics influence student's willingness to change evaluation scores. Additional information from the semester will impact views of the student and may alter their responses to questions provided on the evaluation instrument. If students significantly change their overall instructor and course appraisal, variables such whether or not the instructor presents material in manner appealing to students and students' views of whether or not the course is worthwhile will be play a significant role in the stability or variability in overall attitudes. How students view the instructor's presentations and attitude as well as course related variables (course is worthwhile, evaluations procedures are good) are subject to views on whether not students continue to view instructors as entertaining and fair may have a direct impact on the stability or variability on these factors.

Concern over whether a student would knowingly try to anchor, i.e. answer a question consistently across the semester, their responses at the beginning and end of the semester led to the development of an additional, "control" questionnaire. Students who complete this questionnaire are asked to evaluate all instructors and courses they are enrolled in other than the current class. Comparison of these results with students who completed the evaluation at the beginning and end of the semester will be used to determine whether or not students evaluating courses and instructors twice in the semester tend to answer similarly at the end of the semester to what they answer at the beginning of the semester.

Two additional questions are included in the final evaluation procedure: the number of semesters OSU-Stillwater (including the current semester) and the number of hours that have been accumulated at another institution in ten hour blocks (i.e. 0-10 hours, 11-20 hours, and so forth to more than 60 hours earned elsewhere). These two variables are included in the vector of variables related to the student as they are demographic in nature.

In addition to those two questions, an additional five questions are posed to students at the end of the semester that had not been asked previously. Each is rated as either definitely yes, yes, undecided, no, definitely no, and not applicable. These questions are not posed at the beginning of the semester in order to have the student experience the whole course and fully rely on the student's own experiences. The first question is whether or not the student had learned a lot in the course. This question is typically on the OSU evaluation instrument but is omitted from the initial evaluation given to students. Additionally, questions are posed as to whether or not the course (instructor) improved over the course of the semester and whether the student would recommend the course (instructor) to a friend. These questions would serve as tools to determine if students who believed that instructors and courses that had improved over the course of the semester is consistent with their overall instructor and course appraisal. The evaluation instruments that are used in this study may be found in the appendices to this chapter (initial questionnaire in Appendix 3, the control questionnaire in Appendix 4, and the final questionnaire in Appendix 5).

Empirical Results

Procedures

Twenty two courses in the College of Agricultural Sciences and Natural Resources (CASNR) participate in this research. Participating classes are from the departments of animal science, agricultural economics, agricultural communication, education, and leadership, plant and soil science, horticulture, and natural resource ecology and management. Of the twenty-two courses, one course is being offered for the first time by a full professor with two courses being taught for the first time by a new instructor (the aforementioned full professor in the new course offering as well a graduate student instructor). There are two freshmen courses (i.e. 1000 level), four sophomore level, nine junior level, and seven senior level courses yielding a total of 869 evaluations. Seventeen instructors participate with nine of those being full professors, two associate professors, five assistant professors, and one graduate student instructor.

The proctor for the administration of the questionnaire is introduced by the instructor of the course prior to the evaluations being distributed. Two proctors are used at the beginning of the semester due to some courses evaluating instructors at the same time, while only one proctor is used at the end of the semester to ensure continuity among verbal instructions. Both proctors are not involved in any way with participating courses in terms of the instruction of students and grading of assignments. Evaluations are completed within the first two weeks of the fall 2007 semester with the time of the evaluation being determined by the instructor to allow for the least amount of intrusion in the class. Students, on average, complete the questionnaire in fifteen minutes at both points in the semester.

Students participating in the voluntary research are assigned an individual identification code that would identify their responses at the beginning and end of the semester. The code number is a five digit alphanumeric code based on information only known by the student. The first digit is the first letter of the high school name from which the student was graduated. Digits two and three are the student's birth month expressed as a two digit number (January is 01, February is 02, etc.) with the final two digits being the last two digits of the student identification number. Problems arise at the end of the semester as students did not remember which identification number they initially used due to the fact Oklahoma State assigns multiple identification numbers for students as a way to get away from use of the social security number as a identification number. Students are encouraged at the end of the semester to put down multiple code numbers down in case the student is unable to remember the last two digits from the beginning of the semester. Several questionnaires are successfully matched with evaluations at the beginning of the semester due to encouragement of students to write multiple identification numbers on the evaluation.

An informational cover sheet is included that listed the title of the research, a student's rights as a research volunteer, how to determine their individual identification code, and that the research would occur twice in the semester. The proctor did not announce that students would be given an additional opportunity to evaluate the instructor and course towards the end of the semester until the initial evaluation was completed. This is an attempt to have the student feel this initial evaluation is the actual evaluation. Students are encouraged to keep the cover sheet in case they have questions later as the sheet had contacts of persons who could answer those questions. A copy of

the cover sheet is included in Appendix 2. The informational cover sheet also stresses that all responses will be kept confidential as the instructor would never see a student's identification code and that the instructors would not see results (initial or final) until after the semester had concluded.

In addition to the questions asked on the evaluation instrument, information about the time the class met (0 if a morning class and 1 if an afternoon), the number of class periods that have met thus far in the semester (the *Day* variable) including the current class period, and whether or not the evaluation is administered at the beginning, middle, or end of the class period. The *Day* variable includes the number of labs that have occurred where applicable and is only calculated in evaluations that were completed at the beginning of the semester. End of semester evaluations are distributed prior to Thanksgiving (two courses) with the remainder being completed in the final two weeks of classes after Thanksgiving break. In only one class is an instructor evaluated (at the beginning of the semester) in the middle of the class period while all evaluations at the end of the semester were completed evaluations at the beginning or end of the period. The number of students in the class is also recorded at both points in the semester, based on enrollment provided by the instructor. The standard OSU evaluations provide space for students to make written, qualitative comments and this is continued only on the final evaluation instrument. Those comments are not viewed by persons involved in conducting this research and are passed on to the respective instructors due to the difficult nature of quantifying written comments. The summary statistics are provided in Table 1 for initial results and Table 2 for final results. These tables include all collected responses at both points in the semester.

Not all the variables that are used are discrete and ordered. Variables such as class size (continuous) as well as whether the course is a new offering, assistant, associate, or full professor, and point in the class the evaluation is completed (dummy variables) are included. Answers for purpose for taking the course (*Purpose*) are elective (coded as 0), general studies, related to major, and major (4) while *Type* of course allows answers of lecture (4), lab, IPI, short course, and other (coded as 0). The evaluation instrument allows students to mark one of nine colleges at OSU, but are ultimately coded as a CASNR student (coded as 1) or from other colleges (0).

The "control" questionnaire is distributed in classes that have at least one hundred students. Of the twenty-two participating courses, five have enrollment of at least one hundred students, with only one course in the upper division meeting this criterion. Control questionnaires are distributed to approximately fifteen to twenty percent of students in those courses. These questionnaires are randomly mixed through the initial evaluations prior to distribution to the class. Students who receive these questionnaires are asked to answer these questions about all other classes except for the current course. This questionnaire is essentially identical to the initial evaluation except for the title of the evaluation is in bold italics whereas the initial evaluation is in bold (see Appendix 3 and 4). Minor changes in the wording of questions are required to make them appropriate to all other classes. Results from this questionnaire are shown in Table 3. All three questionnaires (initial, control, and final) are in the appendices.

Initial Semester Results

Two initial models are initially estimated, one using "overall INSTRUCTOR appraisal" and "Overall, this is a GOOD course" as the dependent variables. An ordered probit

model is estimated for each dependent variable due to the ordered nature of the evaluation responses. These two initial models are estimated to identify important characteristics that define student perceptions of overall instructor and course appraisal. Variables that are highly significant in these equations are then regressed against the vectors of variables shown in equation 1. Independent variables in the instructor appraisal model are student perceptions regarding the instructor's preparation, effort devoted to teaching, knowledge, presentation of the material, attitude, and ability to explain the material. The model with overall perceptions of the course (*CourseOverall*) uses appropriate workload for the hours of credit, relevant and useful assignments, testing evaluations procedures are good, adequate involvement of students, and the degree to which the course is worthwhile to the student (*Workload, Assignments, Tests, Involve,* and *Worthwhile*) as independent variables. The literature on SET suggests that differences exist between upper division (i.e. junior and senior level courses) and lower division (freshman and sophomore) courses in terms of results. A pooled model is estimated along with models for upper and lower division courses. A likelihood ratio test is conducted to determine the appropriateness of the pooled model versus the separate models for both upper and lower division courses. Tests for the instructor and course models reject the null hypothesis that there is no difference between the pooled, upper division, and lower division models.

Results from both models are shown in Tables 4 and 5 for instructor and course appraisal, respectively. Care should be used when viewing the results as the parameter coefficients reflect the probability of being rated lower. Thus a negative parameter coefficient implies that an increase in the independent variable decreases the probability

of a lower rating for the dependent variable. Students in upper division courses are most influenced by the instructor's attitude, ability to explain, and most importantly, the presentation of material while students in lower divisions are influenced by the effort devoted to teaching and presentation in developing early impressions of the instructor. This is consistent with Merritt (2008) in regards to the impact of how material is presented on the initial impressions of students. However, this study does not define what factors students include in "presentation." Initial impressions of courses at both the upper and lower division level found all the independent variables significant at varying levels. Rather unsurprisingly, students who find a course worthwhile are more likely to give the course a higher overall rating.

Variables that are highly significant in the initial models (*Present*, *TeachEffort*, and *Worthwhile*) are then used as dependent variables which are regressed against independent variables shown in equation 3. These results are shown in Tables 6 through 9. The first model used presentation ability as the dependent variable. The results of this model are shown Tables 6 and 7 for lower and upper division courses, respectively, as there are significant differences between upper and lower division courses. Students in both upper and lower division classes want instructors to be entertaining although only students in upper division courses want to be actively involved during the presentation of material. Instructors who are seen as fair by students (in upper division courses) are more likely to rate presentation of material higher than those students who did not view their instructors as fair. Although students are not told by the proctor the rank of the instructor, students across divisions did rate instructors differently based on rank. Students in lower division courses rated an instructor higher than assistant professors in

terms of presentation while students in upper division courses are more likely to rate associate professors higher than full professors' presentation ability. Further testing should occur to determine if this might be influenced, in part, by the department in which the class is offered.

The effort devoted to teaching is also regressed against all variables, but a likelihood ratio test determined that significant differences did not exist across course division and a pooled model is favored. Students who complete the evaluation at the end of the class period also tend to rate instructor's teaching effort higher than those completing the evaluation at the beginning. This difference in score due to when the SET is given is a cause for concern and suggests the need for inquiry as to why this occurs. Effort devoted to teaching is rated lower given more exposure to the instructor by the student, although this is only marginall significant. Instructors seen as entertaining, fair, and able to actively involve students are rated higher in teaching effort.

A separate ordered probit model is estimated for whether students view the course as worthwhile as shown in Table 9. Students who sign up for a course because of a professor's recommendation are more likely to see a course as worthwhile while students who sign up for the class expecting to get a good grade also has a positive impact on ratings of effort devoted to teaching. Once again students want their instructor to be fair. Afternoon courses are seen as less worthwhile relative to morning classes which should be investigated further. The student's early impressions of the course from the syllabus also play a significant positive role in early perceptions of whether or not the course is worthwhile in their minds. Being able to actively involve students in a course in the early stages decreases the probability of students viewing the course as worthwhile.

End of Semester Results

A total of 867 responses are collected initially in the semester in addition to the 155 control questionnaires. A total of 897 evaluations are completed at the end of the semester. Of these, 423 evaluations are successfully matched by identification code numbers with an additional 67 responses successfully matched to a control questionnaire from earlier in the semester. Thus, the population in the research project (defined as unmatched initial evaluations) differs from the sample (matched final evaluations). These differences are most obvious in the percentage of males completing the evaluation instruments. Approximately half of all unmatched initial evaluations are completed by males, while this percentage falls to forty percent in evaluations that are successfully matched. The gender question is not asked on the final evaluation instrument due to the ability to match evaluations based on the identification code number.

Collected means are shown in Tables 10 through 14 for the different subsets of evaluations (matched initial, unmatched initial, matched final, unmatched final, and the final evaluations of the control group). Comparison of means among the different subsets of completed evaluations is included in Tables 15 through 17 (by all courses, upper division courses, and lower division courses). The control group's final evaluation scores are provided in table 18 where superscripts denote significant differences in the means relative to final matched evaluations.

The overall instructor appraisal does not change for all courses. However, other instructor related variables are significantly different over the course of the semester contrary to the existing literature on SET (as denoted by superscripts in Tables 15 through 17). More importantly, the results change when the overall instructor appraisal is

segregated between courses at the upper and lower division level. The overall appraisal of instructors in upper division courses decreases while it increases in lower division courses

Cross tabulations are also calculated for course and instructor variables and shown in Tables 19 through 30 (initial ratings are in the rows with final ratings in the columns). These tables show the distribution of changes by direction and magnitude of the change rather than the mean change. Students who answer course related questions with "not applicable" in the beginning of the semester have those answers grouped as undecided while "not applicable" responses at the end of the semester are treated as non-responses. Undecided/not applicable responses are treated as being in the middle of the rating scale (a 3 rating) for course related variables.

Chi-square tests are also conducted with results showing that the distributions of scores have significantly changed over the course of the semester for instructor and course related variables. Of the 423 matched evaluations in all courses, 56 students decrease their overall instructor appraisal rating while 231 do not change, and 136 increase their opinions of instructor appraisal. This can be compared to overall course appraisal which has 44 students decrease their ratings, 154 exhibiting no change, and 221 students increase overall course appraisal among 419 observations. "Not applicable" responses to questions at the end of the semester are ignored.

Changes in means for course variables are generally positive regardless of whether all, upper division, or lower division courses are analyzed. This finding should not be surprising due to a lack of information available to students when the initial evaluation is conducted. Students may also realize the difference in abilities between

friends who give them information on courses and instructors prior to enrollment. Changes in student's views of course variables (accuracy of syllabus, entertaining instructor, distractions in classroom, etc.) are also significantly different across the semester. Differences do arise between upper and lower division courses which are often masked when participating courses are aggregated. Expected attendance as reported at the beginning of the semester seems to be understated. Grade expectations decrease during the semester as information about actual performance is received. It appears that students either overestimate their abilities and/or underestimate course difficulty.

A pooled means test for matched student evaluation responses shows students' mean evaluations of course and instructor related variables do change during a semester. Students in upper division courses typically decrease overall instructor appraisal while students in lower division courses increase overall instructor appraisal. Student views including their ability to maintain focus in the classroom, distractions that occur in the classroom, and whether the instructor is able to actively involve students positively change across the semester for both upper and lower division courses.

A control questionnaire is incorporated into the research project to test for the presence of anchoring by students to their initial responses. The null hypothesis is that responses would not be significantly different (in terms of the mean) between students who evaluate courses and instructors twice and students who only evaluate the course and instructor once, i.e $H_0 = \mu_1 = \mu_2$, where $\mu 1$ is the mean of the final evaluation among students whose evaluations are matched and $\mu 2$ is the mean from matched control questionnaires. A difference in means test is conducted for all course and instructor variables. Variables that are significantly different in the control group relative to end of

semester matched evaluations are also included in table 18. Control questionnaires are distributed in classes with at least one hundred students, care should be taken with these results since only 67 responses (11 in upper division courses) are successfully matched across the semester compared to the 423 evaluations successfully matched across the semester. A further note regarding these findings is that students may not have fully understood the instructions leading to the failure to reject the null hypothesis in many cases. In many cases, anchoring does not seem to be present among these two groups. However, students who completed the control question typically had been at OSU fewer semesters and transferred fewer hours from another institution to OSU. Students completing the questionnaire in the lower division courses did not rate variables significantly different than their counterparts who completed two evaluations. Results from the control questionnaire are biased to larger one and two thousand division courses which prohibit meaningful conclusions being drawn about anchoring in upper division courses.

Multinomial Logit Modeling

Given that students generally do change opinions on instructor and course related variables after the first two weeks of classes, the reasons for the change are evaluated (as indicated by significant differences in means). This is done by a multinomial logit that is estimated in PROC CATMOD in SAS 9.1. An ordered probit model would have been an appropriate model to use as well, but given the distribution of the available matched evaluation data a multinomial logit is employed. The data could change in discrete units from plus or minus 4 given that the rating system employed allows students to rate instructors/courses on a zero to four scale. The majority of instructor related variable

response changes between -1 and 2. This compares to the course related variables having the majority of response changes between -2 and 2. The nature of the changes in evaluation scores allow for estimation of models based on students who did not change, decrease, or increase their appraisal of the instructor. Estimation of the multinomial logit in this instance is less cumbersome than the ordered probit where levels of change in students' responses are not observed.

As with the results of the first impression study, likelihood ratio tests are conducted to determine the appropriateness of the pooled model versus separate models for the upper and lower division courses. The test statistic for both the instructor and course appraisal model is 19.68 due to eleven degrees of freedom. Both pooled models are rejected and the models for the upper and lower division courses are favored. These results are shown in Tables 31, 32, 33, 34. Due to the marginal effects of a multinomial logit not being equal to the parameter estimates, these are calculated and are shown in Tables 35 and 36 for the instructor and course models, respectively. Marginal effects for a multinomial logit are calculated as

$$(7) \qquad \frac{\partial P_j}{\partial x_i} = P_j[\beta_j - \overline{\beta}]$$

where P_j is the probability of the jth alternative and β_j is the parameter estimate of the j^{th} alternative and $\overline{\beta}$ is the sum of parameter estimates times the probability for all alternatives (Greene 2003). The probability of the j^{th} alternative is calculated as $P_j = \frac{e^{\beta_j' x_i}}{1 + \sum_{k=1}^{2} e^{\beta_k' x_i}}$, which is adapted from Greene (2003). As there are three alternatives in the model (increase, decrease, no change) the multinomial logit model produces parameter estimates for two models whose coefficients are relative to the

omitted model, which is no change in this case. The numeral one which appears in the probability equation is a result of the parameters that are not estimated in PROC CATMOD. Additionally, the probability for no change in instructor/course appraisal would have a numeral one in the numerator instead of the product of the parameter estimates for the j^{th} alternative. Marginal effects are calculated at the mean of all independent variables. The marginal effects shown in these tables are expected percentage changes given a one unit increase in an independent variable, *ceteris paribus*. The maximum amount of change for any student is ±4. Therefore, a student in an upper division course who increased their presentation score by 4 is 63.2% less likely not to have decreased their instructor appraisal score. Marginal effects for all courses are reported even though the models for upper and lower division courses are preferred in the instructor and course appraisal models.

Significant variables in both the instructor and course appraisal multinomial logit models varied from results in the first impressions portion of this essay. Presentation once again is a key factor in explaining change in instructor appraisal as it is determining first impressions of instructor. Effort devoted to teaching is not as important at the end of the semester as it is at the beginning of the semester. Attitude is also important in both cases for upper division courses leading to instructors who increase their rating in this respect are more likely to have a positive rating. (Negative coefficients in the ordered probit model are equivalent to the positive coefficients given by the multinomial logit model.) Instructor's ability to explain material is significant in explaining a decrease in instructor appraisal relative to no change in instructor appraisal regardless of course division. Marginal significance (i.e. at the 10% level) is present for ability to explain

material in increasing instructor scores in upper division courses and all courses. Course related variables (*Workload, Assignments, Tests, Involve,* and *Worthwhile*) are generally not significant in explaining changes in instructor appraisal. The exception to this is in lower division courses where testing and involvement of students can affect instructor appraisal. Marginal effects for these two variables (*Tests* and *Involved)* in lower division courses range between 5 and 7% percent.

Almost all course related variables are important in determining positive or negative impressions of courses while this is not the case in determining positive changes in overall course appraisal. Results also vary by course level in this regard. Lower division courses see workload of the course, relevant assignments, and how worthwhile they feel the class is while students in upper division courses are concerned about tests and how worthwhile the class is viewed in explaining a positive change in course appraisal which is consistent with Remedios (2008). The ability to explain material and knowledge of course material do have a small impact on course appraisal in lower division courses. Tests and how worthwhile the course is viewed are the only significant determinants in explaining decreases in course appraisal. This may not be surprising, but is something instructors should bear in mind as courses are designed.

Additional models are estimated to determine the factors that lead to changes (positive, no change, or decrease) in each of the instructor and course related variables with associated marginal effects which are reported in Tables 37 through 69. There are no variables that are significant in every model estimated as well as differences existed between course divisions. Students who change their opinion of their instructor's fairness or their ability to maintain focus in a course are more likely to decrease opinions

in several models. The number of hours transferred to OSU is significant in several of the estimated models in explaining changes in the various dependent variables. The marginal effects for transferred hours are typically small (less than 5%) suggesting that increases in transferred hours to OSU has a negliglible impact on changes in the dependent variable. However, as the transferred hours variable is measured in ten hour increments, a student who transfers 60 hours of credit to OSU is 25% more likely to rate an aspect of the instructor or course differently than a student who transfers ten hours of credit to OSU. Marginal effects on the whole across all models explaining change in the instructor/course related variables are typically less than ten percent.

Conclusions

Students have a multitude of sources on which to base expectations of instructors and courses in SET from friends to professors to web resources to actual experiences with the instructor in the first few days of a course. Instructors that understand what forms the pre-impressions and initial impressions of students can control certain factors to make the experience more worthwhile for students as well as have a more accurate glimpse into ways to motivate students through assignments, lectures, and exams. Determinants of pre-impressions and first impressions of instructor and course appraisal are examined in this research. Factors both under the instructor's control as well factors outside of his/her control are examined.

Results for the first objective suggest that instructors who present the material in a manner the students find appealing will see improved SET scores. This finding is consistent with Fleming, Bazen, and Wetzstein (2005) and Merritt (2008). In addition to effective presentation of material, instructors that are seen as entertaining will have

higher scores in regards to overall instructor appraisal. Instructors should not, however, sacrifice students perceiving them as fair. It is likely that students want you to be fair to them individually as opposed to the class as a whole. Students' impressions of the instructor's effort devoted to teaching also impacts the overall impressions of instructors at the beginning of the semester. Courses that are seen as worthwhile initially by students also positively impact student impressions of the course at the beginning of the semester.

Gender of the instructor or student is insignificant in determining initial impressions of a course or instructor related variables. The SET literature is split on whether or not this is an actual problem with student evaluations. All models in this paper where these variables are included are relative to a male student evaluating a male instructor. It is possible that initial impressions are not driven by gender bias but may be developed over the course of the semester for various reasons and should be a topic of future research. Outside sources of information are found to have a limited impact on initial impressions of a course or instructor. The use of website recommendations is not found to have a significant impact on ratings. Students who sign up for a course because of a professor's recomendation are likely to rate the course as being worthwhile more positively than those who do not.

Limitations to conclusions regarding the impact of outside sources exist due to the wording of the question. Instead of wording the question as "I signed up for this course because," a more proper statement would have been "I used the following sources of information in gaining information about this course." Regardless, students may not view these websites as credible themselves or a lack of awareness may factor into this result. It is possible that departmental curriculum design prevents these references from

affecting the decision to enroll in a course. Of course, there is the potential for a selection bias to be present, i.e. students who use these websites chose not to enroll in these classes and are not part of the sample population.

Results from comparison of longitudinally matched evaluations suggest that on the whole, instructor appraisal does not change over the semester (objective three). However, this finding masks that students in upper division courses decrease instructor evaluations during the semester while students in lower division courses increase their appraisal of instructors. Students do change opinions of instructor related variables (their preparation, presentation of material, ability to explain material, etc.) over the course of the semester as well. This is contrary to Merritt's (2008) assertion that evaluations measure snap judgments that occurred at the beginning of the semester.

Consistent across the semester (whether first impressions or comparison results across the semester), is the need for instructors to present material in an effective and engaging way. The magnitude of this coefficient at both points in the semester dwarfed coefficients of other instructor related variables. This may be a key way to improve overall ratings of instructor appraisal or performance. Instructors who want to maintain high levels of instructor appraisal throughout the semester should focus on ways to improve presentation of material as well as their ability to explain material. Similarly, the ability of instructors to motivate students to see the worth in the course is an important factor that determines overall course appraisal. Only one instance occurs where its parameter estimate is not the largest (workload in lower division courses explaining a positive change relative to no change in overall course appraisal).

Students who evaluate instructors twice are not significantly different from students who evaluate courses just once (objective 3b) except for ratings of presentation of material and adequate involvement of students. The lack of anchoring stands in contrast to Merritt's (2008) assertion regarding end of semester evaluations reflect snap judgments from the beginning of the semester. This finding however needs further research as classes with initial enrollments of at least one hundred students are only selected to be part of the control group. This fact may be the reason that students rated presentation of material and adequate involvement of students differently. At the very least, instructors of large, often introductory, courses are seemingly not negatively impacted by the size of the course, especially on instructor appraisal.

A student's expected grade is significant in some of the initial semester models that are estimated. Changes in expected grade across the semester are more likely to impact an instructor's rating than the course's rating. This is true in regards to knowledge of the instructor, effort devoted to teaching, and attitude of the instructor. Expected changes in a grade are important in terms of explaining negative changes in workload responses and whether students view the course as worthwhile across the semester.

Where this research falls short is determining what students mean when they read the statement "presentation of material", "effort devoted to teaching", and "this course is worthwhile to me". While some of the questions on the SET form at Oklahoma State University may be viewed as straightforward, students may interpret the question in a different way leading to answers that are not as straightforward as they appear to be. This further underscores the need for additional methods to assess teaching effectiveness

in terms of review, promotion, and tenure decisions whether it be teaching portfolios or asking for feedback from students regularly throughout the semester.

It is entirely possible that results presented herein are not indicative of evaluations campus wide at Oklahoma State University. Having students evaluate instructors twice may lead to students considering responses at the end of the semester which may not be indicative of typical evaluations that are conducted only the end of the semester. Concerns over this fact can be dismissed given the results Wetzstein, Broder, and Wilson (1984) present showing that while instructor reputation may drive initial impressions what is done by the instructor does impact final evaluations given that a graduate student outperformed a known professor once reputation was corrected for. Yet the underlying result of this study is that you can change students' minds on instructor related variables over the course of the semester.

While there may be instances where once bad experience in the classroom may impact results of SET at the end of the semester regardless of what happens positively over the course of the semester, 32% of students in this study are open minded and willing to change their opinions based on what instructors do and how much they learn. It is clear that students do not have enough information to fully assess course related variables in the first two weeks of the semester and hence the increases in mean seen in this study on those variables and likewise the changes that are seen, to a smaller degree, in instructor related variables.

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Table III-1. Initial Summary Statistics: Mean, Standard Deviation, and Data Range

		All Courses			Upper Division Courses			Lower Division Courses		
Variable	Data Range	N	Mean	Standard Deviation	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Dependent Variables										
InstrOverall	0-4	863	3.501	0.709	442	3.652	0.556	421	3.342	0.812
CourseOverall	1-5	853	3.775	0.774	440	3.923	0.798	413	3.617	0.717
Student Characteristics										
Gender	0-1	866	0.547	0.498	444	0.547	0.498	422	0.547	0.498
College	0-1	867	0.950	0.217	444	0.991	0.095	423	0.908	0.290
Class	0-4	867	1.939	1.083	444	2.588	0.661	423	1.258	1.020
Purpose	0-3	867	2.326	0.747	444	2.336	0.762	423	2.317	0.731
Required	0-1	867	0.817	0.387	444	0.723	0.448	423	0.915	0.279
Type	0-4	867	3.888	0.461	444	3.914	0.432	423	3.861	0.489
PrevCourse	0-1	863	0.304	0.460	440	0.441	0.497	423	0.161	0.368
PrevInstr	0-1	865	0.133	0.340	442	0.235	0.425	423	0.026	0.159
Ratings	0-1	866	0.127	0.333	444	0.115	0.319	422	0.140	0.347
CourseValue	0-2	865	0.828	0.768	444	0.687	0.741	421	0.976	0.768
Male Evaluating Male	0-1	867	0.378	0.485	444	0.419	0.494	423	0.336	0.473
Male Evaluating Female	0-1	867	0.074	0.262	444	0.034	0.181	423	0.116	0.320
Female Evaluating Male	0-1	867	0.374	0.484	444	0.381	0.486	423	0.366	0.482
Female Evaluating Female	0-1	867	0.173	0.378	444	0.167	0.373	423	0.180	0.384
Instructor Characteristics										
Prep	0-4	865	3.327	0.730	444	3.421	0.689	421	3.228	0.759
TeachEffort	0-4	864	3.422	0.695	443	3.521	0.625	421	3.318	0.479
Present	0-4	863	3.389	0.719	442	3.520	0.621	421	3.252	0.786

Table III-1. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Knowledge	0-4	863	3.194	0.791	442	3.292	0.761	421	3.090	0.809
Explain	0-4	862	3.538	0.665	441	3.578	0.606	421	3.496	0.719
Attitude	0-4	862	3.276	0.785	441	3.385	0.727	421	3.162	0.827
Full Professor	0-1	867	0.632	0.483	444	0.563	0.497	423	0.704	0.457
Associate Professor	0-1	867	0.070	0.256	444	0.137	0.345	423	0.000	0.000
Assistant Professor	0-1	867	0.265	0.442	444	0.300	0.459	423	0.229	0.421
Instructor	0-1	867	0.032	0.177	444	0.000	0.000	423	0.066	0.249
InstGender	0-1	867	0.247	0.431	444	0.200	0.401	423	0.296	0.457
Course Characteristics										
Workload	1-5	863	3.637	0.758	443	3.806	0.769	420	3.460	0.705
Assignments	1-5	864	3.657	0.757	444	3.838	0.787	420	3.467	0.674
Tests	1-5	862	3.463	0.709	442	3.593	0.754	420	3.326	0.630
Involve	1-5	862	3.774	0.766	442	3.977	0.750	420	3.560	0.724
Worthwhile	1-5	863	3.849	0.789	443	4.005	0.804	420	3.686	0.738
Class size	6-230	867	106.747	79.187	444	50.554	28.534	423	165.730	72.136
Upper Division Course	0-1	867	0.512	0.500	444	1.000	0.000	423	0.000	0.000
Lower Division Course	0-1	867	0.488	0.500	444	0.000	0.000	423	1.000	0.000
Time	0-1	867	0.418	0.493	444	0.446	0.498	423	0.388	0.488
New Course	0-1	867	0.027	0.161	444	0.052	0.222	423	0.000	0.000
Day	1-5	867	2.902	1.060	444	3.074	1.143	423	2.721	0.933
Beginning	0-1	867	0.892	0.311	444	0.788	0.409	423	1.000	0.000
Middle	0-1	867	0.021	0.143	444	0.041	0.197	423	0.000	0.000
End	0-1	867	0.088	0.283	444	0.171	0.377	423	0.000	0.000

Table III-1. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Student Views										
TeachStyle	1-5	791	3.271	0.943	398	3.450	1.049	393	3.089	0.782
OneSection	0-2	789	1.331	0.854	400	1.463	0.809	389	1.195	0.878
FriendRec	1-5	745	2.972	1.041	375	3.003	1.115	370	2.941	0.961
WebRec	1-5	738	2.581	0.848	371	2.534	0.901	367	2.629	0.789
ProfRec	1-5	744	2.829	1.010	376	2.886	1.096	368	2.772	0.911
SubInterest	1-5	748	3.560	0.970	379	3.786	0.997	369	3.328	0.884
Goodgrade	1-5	735	2.762	0.975	371	2.811	1.074	364	2.712	0.860
Syllabus	1-5	834	3.675	0.834	424	3.840	0.841	410	3.505	0.792
ActiveInvolve	1-5	861	3.772	0.792	442	4.007	0.775	419	3.525	0.733
Entertain	1-5	857	4.029	0.843	440	4.286	0.807	417	3.758	0.794
Ask	1-5	860	3.141	1.080	442	3.097	1.156	418	3.187	0.993
Answer	1-5	860	3.065	1.086	440	3.048	1.161	420	3.083	1.001
Fair	1-5	859	3.929	0.800	440	4.143	0.778	419	3.704	0.760
CalledOn	1-5	862	3.209	1.102	442	3.183	1.180	420	3.236	1.015
Focus	1-5	861	3.750	0.846	441	3.880	0.869	420	3.614	0.799
Visualaids	1-5	857	3.704	0.858	438	3.847	0.880	419	3.554	0.809
Stories	1-5	857	3.770	0.856	439	4.000	0.849	418	3.529	0.796
Classroom	1-5	859	2.458	0.965	439	2.392	0.985	420	2.526	0.941
Distract	0-4	858	2.691	1.004	438	2.582	1.042	420	2.805	0.950
ExpAttendance	0-4	860	0.241	0.549	439	0.253	0.551	421	0.228	0.548
ExpGrade	0-4	862	3.687	0.599	440	3.732	0.506	422	3.640	0.681

Table III-2. Final Summary Statistics: Mean, Standard Deviation, and Data Range

		All Courses			Upper Division Courses			Lower Division Courses		
Variable	Data Range	N	Mean	Standard Deviation	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Dependent Variables										
InstrOverall	0-4	895	3.550	0.708	420	3.545	0.751	475	3.554	0.668
CourseOverall	1-5	895	4.251	0.852	420	4.286	0.892	475	4.221	0.814
Course Improved	1-5	885	3.863	1.096	415	3.817	1.184	470	3.904	1.012
Instructor Improved	1-5	882	4.059	1.006	413	4.031	1.073	469	4.083	0.943
Recommend Instructor to Friend	1-5	896	4.325	0.883	420	4.348	0.923	476	4.305	0.847
Recommend Course to Friend	1-5	893	4.097	1.013	417	4.180	1.033	476	4.025	0.990
Student Characteristics										
College	0-1	897	0.957	0.204	421	0.971	0.167	476	0.943	0.232
Class	0-4	897	1.819	1.147	421	2.596	0.675	476	1.132	1.035
Purpose	0-3	896	2.316	0.828	420	2.329	0.855	476	2.305	0.804
Required	0-1	893	0.824	0.381	418	0.703	0.457	475	0.931	0.255
Type	0-4	891	3.923	0.341	419	3.914	0.328	472	3.930	0.353
Transferred Hours	0-7	887	2.445	2.586	417	2.909	2.800	470	2.034	2.307
OSU Semesters	0-60	895	3.712	3.671	419	4.949	3.764	476	2.624	3.220
Instructor Characteristics										
Prep	0-4	896	3.536	0.678	421	3.518	0.745	475	3.552	0.612
TeachEffort	0-4	896	3.600	0.639	421	3.582	0.704	475	3.617	0.574
Present	0-4	896	3.306	0.864	421	3.304	0.937	475	3.307	0.794
Knowledge	0-4	896	3.680	0.628	421	3.610	0.721	475	3.741	0.526
Explain	0-4	895	3.401	0.833	421	3.385	0.905	474	3.416	0.765

Table III-2. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Attitude	0-4	896	3.603	0.700	421	3.648	0.665	475	3.562	0.728
Full Professor	0-1	897	0.668	0.471	421	0.577	0.495	476	0.748	0.435
Associate Professor	0-1	897	0.068	0.252	421	0.145	0.352	476	0.000	0.000
Assistant Professor	0-1	897	0.237	0.426	421	0.278	0.449	476	0.202	0.402
Instructor	0-1	897	0.027	0.161	421	0.000	0.000	476	0.050	0.219
Course Characteristics										
Learned a lot	1-5	896	4.220	0.853	420	4.286	0.892	476	4.212	0.797
Workload	1-5	896	4.217	0.790	415	3.817	1.184	476	4.202	0.732
Assignments	1-5	895	4.226	0.800	413	4.031	1.073	475	4.202	0.739
Tests	1-5	891	4.137	0.893	420	4.348	0.923	476	4.090	0.860
Involve	1-5	895	4.226	0.757	417	4.180	1.033	475	4.126	0.747
Worthwhile	1-5	895	4.143	0.949	420	4.286	0.892	475	4.107	0.902
Class size	6-220	897	112.096	78.033	421	50.912	29.029	476	166.210	66.998
Upper Division Course	0-1	897	0.469	0.499	421	1.000	0.000	476	0.000	0.000
Lower Division Course	0-1	897	0.531	0.499	421	0.000	0.000	476	1.000	0.000
Time	0-1	897	0.396	0.489	421	0.447	0.498	476	0.351	0.478
New Course	0-1	897	0.029	0.168	421	0.062	0.241	476	0.000	0.000
Beginning	0-1	897	0.605	0.489	421	0.689	0.464	476	0.532	0.500
End	0-1	897	0.395	0.489	421	0.311	0.464	476	0.468	0.500
Student Views										
Syllabus	1-5	893	4.218	0.787	418	4.232	0.838	475	4.206	0.740
ActiveInvolve	1-5	889	4.070	0.903	419	4.222	0.918	470	3.934	0.868
Entertain	1-5	893	4.239	0.940	420	4.260	1.021	473	4.220	0.863

Table III-2. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Ask	1-5	876	3.059	1.212	411	2.956	1.287	465	3.151	1.135
Answer	1-5	867	3.194	1.229	408	3.086	1.293	459	3.290	1.162
Fair	1-5	895	4.344	0.758	420	4.419	0.728	475	4.278	0.779
CalledOn	1-5	874	3.286	1.227	411	3.192	1.295	463	3.369	1.158
Focus	1-5	890	3.924	0.986	416	4.005	0.994	474	3.852	0.975
Visualaids	1-5	887	4.074	0.941	415	4.140	0.948	472	4.017	0.933
Stories	1-5	881	4.022	0.949	412	4.131	0.990	469	3.925	0.902
Classroom	1-5	858	2.198	1.136	399	2.258	1.214	459	2.146	1.063
Distract	1-5	846	2.547	1.198	397	2.504	1.244	449	2.586	1.156
ExpAttendance	0-4	881	0.495	0.746	412	0.505	0.759	469	0.486	0.735
ExpGrade	0-4	892	3.293	0.753	419	3.415	0.715	473	3.184	0.769

Table III-3. Summary Statistics from the Control Questionnaire: Mean, Standard Deviation, and Data Range[a]

		All Courses			Upper Division Courses			Lower Division Courses		
Variable	Data Range	N	Mean	Standard Deviation	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Dependent Variables										
InstrOverall	0-4	154	3.117	0.695	15	3.667	0.488	139	3.058	0.689
CourseOverall	0-4	151	2.464	1.437	14	3.286	0.469	137	2.380	1.476
Student Characteristics										
Gender	0-1	155	0.574	0.496	15	0.600	0.507	140	0.571	0.497
College	0-1	155	0.929	0.258	15	0.933	0.258	140	0.929	0.258
Class	0-4	155	1.039	0.993	15	2.133	0.516	140	0.921	0.960
PrevCourse	0-1	154	0.442	0.498	15	0.533	0.516	139	0.432	0.497
Ratings	0-1	155	0.155	0.363	15	0.133	0.352	140	0.157	0.365
CourseValue	0-2	155	0.729	0.808	15	0.533	0.743	140	0.750	0.815
Instructor Characteristics										
Prep	0-4	155	3.116	0.693	15	3.467	0.640	140	3.079	0.690
TeachEffort	0-4	155	3.161	0.716	15	3.667	0.488	140	3.107	0.717
Present	0-4	155	2.974	0.764	15	3.533	0.516	140	2.914	0.763
Knowledge	0-4	154	3.429	0.703	15	3.533	0.640	139	3.417	0.711
Explain	0-4	153	2.987	0.743	15	3.333	0.724	138	2.949	0.738
Attitude	0-4	154	3.104	0.826	15	3.600	0.507	139	3.050	0.837
InstGender	0-1	155	0.871	0.336	15	0.867	0.352	140	0.871	0.336
Course Characteristics										
Workload	0-4	154	1.649	1.545	15	2.467	1.302	139	1.561	1.547
Assignments	0-4	154	1.844	1.617	15	2.800	1.207	139	1.741	1.626
Tests	0-4	154	1.422	1.575	15	2.467	1.302	139	1.309	1.564

Table III-3. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Involve	0-4	154	2.000	1.542	15	2.867	1.246	139	1.906	1.546
Worthwhile	0-4	154	2.675	1.423	15	3.067	0.961	139	2.633	1.460
Upper Division Course	0-1	155	0.097	0.297	15	1.000	0.000	140	0.000	0.000
Lower Division Course	0-1	155	0.903	0.297	15	0.000	0.000	140	1.000	0.000
Time	0-1	155	0.729	0.446	15	0.000	0.000	140	0.807	0.396
New Course	0-1	155	0.000	0.000	15	0.000	0.000	140	0.000	0.000
Day	1-5	155	3.652	0.761	15	4.000	0.000	140	3.614	0.792
Beginning	0-1	155	0.903	0.297	15	0.000	0.000	140	1.000	0.000
Middle	0-1	155	0.000	0.000	15	0.000	0.000	140	0.000	0.000
End	0-1	155	0.097	0.297	15	1.000	0.000	140	0.000	0.000
Student Views										
TeachStyle	0-4	144	1.153	1.391	14	1.857	1.610	130	1.077	1.350
OneSection	0-4	140	1.657	0.665	14	1.929	0.267	126	1.627	0.690
FriendRec	0-4	133	1.812	1.315	13	2.615	1.325	120	1.725	1.290
WebRec	0-4	133	1.429	1.182	13	1.462	1.450	120	1.425	1.157
ProfRec	0-4	133	1.534	1.265	13	1.615	1.325	120	1.525	1.263
SubInterest	0-4	135	2.785	1.284	13	2.846	1.144	122	2.779	1.302
Goodgrade	0-4	130	1.431	1.232	12	2.000	1.595	118	1.373	1.182
Syllabus	0-4	152	2.039	1.590	15	2.533	1.457	137	1.985	1.600
ActiveInvolve	0-4	152	1.691	1.554	15	2.933	0.961	137	1.555	1.548
Entertain	0-4	152	2.197	1.505	15	3.067	1.335	137	2.102	1.496
Ask	0-4	152	2.046	1.430	15	2.267	1.438	137	2.022	1.432
Answer	0-4	152	2.000	1.451	15	2.333	1.397	137	1.964	1.457
Fair	0-4	152	2.217	1.513	15	3.267	0.594	137	2.102	1.540

Table III-3. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
CalledOn	0-4	152	1.954	1.471	15	2.400	1.352	137	1.905	1.480
Focus	0-4	151	2.291	1.354	15	2.867	0.915	136	2.228	1.382
Visualaids	0-4	152	1.737	1.568	15	2.867	0.990	137	1.613	1.573
Stories	0-4	152	1.750	1.549	15	3.267	0.594	137	1.584	1.532
Classroom	0-4	151	1.364	1.197	15	1.867	1.302	136	1.309	1.177
Distract	0-4	153	1.706	1.307	15	2.067	1.163	138	1.667	1.320
ExpAttendance	0-4	153	0.288	0.646	15	0.267	0.458	138	0.290	0.664
ExpGrade	0-4	152	3.092	0.556	15	3.200	0.414	137	3.080	0.570

[a] This table includes all collected control questionnaires.

Table III-4. Ordered Probit Estimates of Instructor Appraisal for Upper and Lower Division Courses

Variable	Upper Division Courses[a]		Lower Division Courses[b]	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-7.232***	0.466	-7.906***	0.697
Threshold parameter 2	2.513***	0.216	1.445**	0.567
Threshold parameter 3	---	---	3.217***	0.580
Threshold parameter 4	---	---	4.900***	0.595
Instructor Characteristics				
Prep	0.065	0.183	0.232	0.151
TeachEffort	-0.407*	0.210	-0.495***	0.151
Present	-1.61***	0.196	-1.475***	0.129
Knowledge	0.260	0.168	0.204	0.131
Explain	-0.469***	0.160	-0.076	0.106
Attitude	-0.463***	0.175	-0.155	0.107

[a] Students rated instructors only as very high, high, or average in these courses, the pseudo-R^2 is 0.526.
[b] The pseudo-R^2 is 0.365

Table III-5. Ordered Probit Estimates of Course Appraisal for Upper and Lower Division Courses

	Upper Division Courses[a]		Lower Division Courses[b]	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	10.220***	0.643	7.856***	0.777
Threshold parameter 2	2.115***	0.146	3.725***	0.279
Threshold parameter 3	----	----	6.535***	0.378
Threshold parameter 4	----	----	----	----
Course Characteristics				
Workload	-0.200*	0.121	-0.426***	0.161
Assignments	-0.425***	0.131	-0.634***	0.178
Tests	-0.345***	0.131	-0.475***	0.179
Involve	-0.448***	0.117	-0.405***	0.135
Worthwhile	-1.415***	0.118	-1.406***	0.134

[a] Students rated courses as definitely yes, yes, and undecided/not applicable, the pseudo-R^2 is 0.527.
[b] Students rated courses as definitely yes, yes, no, and undecided/not applicable, the pseudo-R^2 is 0.533.

Table III-6. Ordered Probit Estimates for Presentation of Material in Lower Division Courses

Variable	Parameter Estimate	Standard Error
Intercept	-1.557	2.037
Threshold parameter 2	0.088	0.087
Threshold parameter 3	1.489***	0.206
Threshold parameter 4	3.035***	0.222
Student Characteristics		
College	0.319	0.252
Class	0.190**	0.088
Purpose	0.027	0.113
Required	0.315	0.286
Type	-0.078	0.120
PrevCourse	-0.102	0.207
PrevInstr	-0.470	0.502
Ratings	0.169	0.202
CourseValue	0.163	0.106
Female Evaluating Male	0.014	0.166
Male Evaluating Female	-0.594	0.915
Female Evaluating Female	-0.313	0.976
Instructor Characteristics		
Full Professor	1.234	1.204
Assistant Professor	1.735**	0.711
Course Characteristics		
Class size	-0.004*	0.003
Time	-2.076*	1.197
Day	1.530**	0.712
Student Views		
TeachStyle	-0.052	0.127
OneSection	0.055	0.117
FriendRec	-0.095	0.108
WebRec	0.010	0.149
ProfRec	-0.040	0.123
SubInterest	0.182*	0.094
Goodgrade	0.010	0.098
Syllabus	-0.360***	0.129
ActiveInvolve	-0.239	0.159
Entertain	-0.487***	0.146
Ask	0.153	0.112
Answer	0.019	0.128
Fair	-0.181	0.160

Table III-6. Cont.

Variable	Parameter Estimate	Standard Error
CalledOn	-0.105	0.118
Focus	-0.233**	0.112
Visualaids	-0.178	0.150
Stories	0.073	0.144
Classroom	0.291***	0.100
Distract	-0.156*	0.091
ExpAttendance	-0.315**	0.131
ExpGrade	-0.152	0.094
Log-likelihood	-304.561	

Note: 374 observations in this model with a pseudo-R^2 value of 0.323.
Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.

Table III-7. Ordered Probit Estimates for Presentation of Material in Upper Division Courses

Variable	Parameter Estimate	Standard Error
Intercept	2.903	2.407
Threshold parameter 1	1.490***	0.368
Threshold parameter 2	3.939***	0.412
Student Characteristics		
College	-0.855	0.767
Class	0.129	0.170
Purpose	0.153	0.148
Required	0.042	0.297
Type	0.255	0.481
PrevCourse	-0.097	0.200
PrevInstr	-0.101	0.322
Ratings	0.170	0.291
CourseValue	-0.144	0.130
Female Evaluating Male	0.157	0.212
Male Evaluating Female	1.263**	0.618
Female Evaluating Female	0.796*	0.435
Instructor Characteristics		
Associate Professor	-0.581**	0.369
Assistant Professor	-0.830	0.330
Course Characteristics		
Class size	0.008	0.008
Time	-0.309	0.284
New Course	0.580	0.491
Day	0.137	0.113
Middle	-0.706	1.070
End	-1.639***	0.571
Student Views		
TeachStyle	-0.112	0.128
OneSection	-0.126	0.149
FriendRec	-0.348***	0.129
WebRec	-0.197	0.183
ProfRec	0.034	0.117
SubInterest	-0.081	0.108
Goodgrade	0.108	0.103
Syllabus	0.054	0.141
ActiveInvolve	-0.325*	0.175
Entertain	-0.658***	0.157
Ask	0.164	0.139

Table III-7. Cont.

Variable	Parameter Estimate	Standard Error
Answer	-0.186	0.144
Fair	-0.420***	0.157
CalledOn	0.018	0.126
Focus	0.075	0.122
Visualaids	-0.212*	0.128
Stories	0.070	0.144
Classroom	0.176	0.136
Distract	0.023	0.127
ExpAttendance	-0.026	0.168
ExpGrade	-0.260	0.176
Log-likelihood	-160.844	

Note: 337 observations in this model with a pseudo-R^2 value of 0.579.
Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.

Table III-8. Ordered Probit Estimates of Effort Devoted to Teaching in All Courses

Variable	Parameter Estimate	Standard Error
Intercept	1.147	0.842
Threshold parameter 2	0.156	0.108
Threshold parameter 3	1.467***	0.197
Threshold parameter 4	3.165***	0.208
Student Characteristics		
College	0.371	0.229
Class	0.094	0.069
Purpose	-0.074	0.083
Required	0.062	0.186
Type	0.050	0.113
PrevCourse	0.098	0.129
PrevInstr	-0.336	0.232
Ratings	-0.027	0.151
CourseValue	-0.073	0.072
Female Evaluating Male	-0.104	0.119
Male Evaluating Female	0.152	0.306
Female Evaluating Female	0.189	0.285
Instructor Characteristics		
Full Professor	0.619	0.430
Associate Professor	-0.119	0.471
Assistant Professor	0.363	0.377
Course Characteristics		
Upper Division	-0.335	0.239
Class size	-0.003*	0.002
Time	0.112	0.179
New Course	0.363	0.397
Day	0.162*	0.091
Middle	-0.819	0.748
End	-0.760**	0.327
Student Views		
TeachStyle	-0.143*	0.080
OneSection	0.173**	0.080
FriendRec	-0.026	0.073
WebRec	-0.006	0.100
ProfRec	-0.067	0.076
SubInterest	0.044	0.064
Goodgrade	0.005	0.064
Syllabus	-0.152*	0.085
ActiveInvolve	-0.299***	0.107

Table III-8. Cont.

Variable	Parameter Estimate	Standard Error
Entertain	-0.436***	0.096
Ask	0.063	0.080
Answer	-0.110	0.086
Fair	-0.186*	0.102
CalledOn	0.049	0.078
Focus	-0.073	0.076
Visualaids	-0.062	0.085
Stories	-0.047	0.090
Classroom	0.049	0.074
Distract	0.032	0.067
ExpAttendance	0.026	0.093
ExpGrade	-0.129	0.079
Log-likelihood	-504.942	

Note: 686 observations in this model with a pseudo-R^2 value of 0.387.
Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.

Table III-9. Ordered Probit Estimates of This Course is Worthwhile to Me

Variable	Parameter Estimate	Standard Error
Intercept	4.233***	0.789
Threshold parameter 2	2.479***	0.156
Threshold parameter 3	4.262***	0.181
Threshold parameter 4		
Student Characteristics	0.034	0.232
College	0.030	0.068
Class	0.002	0.080
Purpose	-0.038	0.171
Required	-0.185*	0.099
Type	0.016	0.124
PrevCourse	-0.031	0.205
PrevInstr	0.137	0.146
Ratings	-0.096	0.067
CourseValue	0.080	0.113
Female Evaluating Male	0.103	0.288
Male Evaluating Female	0.149	0.259
Female Evaluating Female		
Instructor Characteristics	0.148	0.412
Full Professor	-0.156	0.431
Associate Professor	-0.121	0.362
Assistant Professor		
Course Characteristics	0.098	0.227
Upper Division	0.001	0.002
Class size	0.210	0.174
Time	0.706*	0.389
New Course	-0.045	0.085
Day	-0.574	0.499
Middle	-0.082	0.271
End		
Student Views	-0.114	0.070
TeachStyle	0.099	0.074
OneSection	-0.032	0.064
FriendRec	-0.075	0.085
WebRec	0.027	0.067
ProfRec	-0.456***	0.062
SubInterest	0.027	0.059
Goodgrade	-0.333***	0.076
Syllabus	-0.212**	0.097
ActiveInvolve	4.233***	0.789

Table III-9. Cont.

Variable	Parameter Estimate	Standard Error
Entertain	-0.133	0.093
Ask	0.050	0.073
Answer	-0.153	0.078
Fair	-0.389***	0.095
CalledOn	0.077	0.070
Focus	-0.004	0.072
Visualaids	0.052	0.079
Stories	-0.221***	0.086
Classroom	0.028	0.066
Distract	0.073	0.062
ExpAttendance	-0.055	0.090
ExpGrade	-0.067	0.080
Log-likelihood	-533.037	

Note: 684 observations in this model with a pseudo-R^2 value of 0.459.
Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.

Table III-10. Initial Matched Evaluations Summary Statistics: Mean, Standard Deviation, and Data Range

		All Courses			Upper Division Courses			Lower Division Courses		
Variable	Data Range	N	Mean	Standard Deviation	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Dependent Variables										
InstrOverall	0-4	423	3.504	0.708	234	3.654	0.552	189	3.317	0.828
CourseOverall	1-5	420	3.745	0.756	233	3.897	0.792	187	3.556	0.665
Student Characteristics										
Gender	0-1	423	0.624	0.485	234	0.603	0.490	189	0.651	0.478
College	0-1	423	0.962	0.191	234	0.987	0.113	189	0.931	0.254
Class	0-4	423	1.910	1.138	234	2.568	0.704	189	1.095	1.042
Purpose	0-3	423	2.340	0.771	234	2.308	0.802	189	2.381	0.731
Required	0-1	423	0.813	0.390	234	0.714	0.453	189	0.937	0.244
Type	0-4	423	3.917	0.365	234	3.936	0.334	189	3.894	0.399
PrevCourse	0-1	422	0.313	0.464	233	0.442	0.498	189	0.153	0.361
PrevInstr	0-1	422	0.152	0.359	233	0.258	0.438	189	0.021	0.144
Ratings	0-1	423	0.113	0.318	234	0.094	0.292	189	0.138	0.345
CourseValue	0-2	423	0.844	0.775	234	0.675	0.751	189	1.053	0.756
Male Evaluating Male	0-1	423	0.322	0.468	234	0.372	0.484	189	0.259	0.439
Male Evaluating Female	0-1	423	0.054	0.227	234	0.026	0.158	189	0.090	0.287
Female Evaluating Male	0-1	423	0.426	0.495	234	0.393	0.489	189	0.466	0.500
Female Evaluating Female	0-1	423	0.199	0.399	234	0.209	0.408	189	0.185	0.389
Instructor Characteristics										
Prep	0-4	423	3.322	0.735	234	3.410	0.713	189	3.212	0.749
TeachEffort	0-4	423	3.423	0.694	234	3.491	0.650	189	3.339	0.738
Present	0-4	423	3.390	0.693	234	3.521	0.623	189	3.228	0.741

Table III-10. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Knowledge	0-4	423	3.165	0.792	234	3.256	0.777	189	3.053	0.797
Explain	0-4	422	3.550	0.651	233	3.592	0.581	189	3.497	0.727
Attitude	0-4	423	3.322	0.735	234	3.410	0.713	189	3.212	0.749
Full Professor	0-1	423	0.622	0.486	234	0.534	0.500	189	0.730	0.445
Associate Professor	0-1	423	0.083	0.276	234	0.150	0.357	189	0.000	0.000
Assistant Professor	0-1	423	0.270	0.444	234	0.316	0.466	189	0.212	0.410
Instructor	0-1	423	0.026	0.159	234	0.000	0.000	189	0.058	0.235
InstGender	0-1	423	0.253	0.435	234	0.235	0.425	189	0.275	0.448
Course Characteristics										
Workload	1-5	423	3.641	0.737	234	3.825	0.769	189	3.413	0.627
Assignments	1-5	423	3.641	0.744	234	3.833	0.782	189	3.402	0.616
Tests	1-5	422	3.393	0.666	233	3.536	0.731	189	3.217	0.526
Involve	1-5	423	3.768	0.740	234	4.000	0.718	189	3.481	0.665
Worthwhile	1-5	422	3.815	0.782	233	3.996	0.807	189	3.593	0.690
Class size	6-230	423	104.116	80.818	234	48.662	28.065	189	172.772	71.547
Upper Division Course	0-1	423	0.553	0.498	234	1.000	0.000	189	0.000	0.000
Lower Division Course	0-1	423	0.447	0.498	234	0.000	0.000	189	1.000	0.000
Time	0-1	423	0.423	0.495	234	0.483	0.501	189	0.349	0.478
New Course	0-1	423	0.035	0.185	234	0.064	0.245	189	0.000	0.000
Day	1-5	423	2.905	1.073	234	3.124	1.152	189	2.635	0.899
Beginning	0-1	423	0.891	0.312	234	0.803	0.398	189	1.000	0.000
Middle	0-1	423	0.026	0.159	234	0.047	0.212	189	0.000	0.000
End	0-1	423	0.083	0.276	234	0.150	0.357	189	0.000	0.000

Table III-10. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Student Views										
TeachStyle	1-5	386	3.244	0.922	206	3.422	1.069	180	3.039	0.663
OneSection	0-2	391	1.322	0.861	213	1.488	0.805	178	1.124	0.887
FriendRec	1-5	372	2.984	1.046	198	3.040	1.144	174	2.920	0.921
WebRec	1-5	367	2.550	0.831	195	2.467	0.904	172	2.645	0.731
ProfRec	1-5	369	2.821	0.981	197	2.832	1.087	172	2.808	0.847
SubInterest	1-5	374	3.540	0.973	200	3.745	1.032	174	3.305	0.843
Goodgrade	1-5	367	2.725	0.913	195	2.759	1.004	172	2.686	0.799
Syllabus	1-5	411	3.672	0.794	223	3.839	0.806	188	3.473	0.734
ActiveInvolve	1-5	423	3.768	0.778	234	4.009	0.747	189	3.471	0.711
Entertain	1-5	421	4.026	0.841	233	4.270	0.815	188	3.723	0.773
Ask	1-5	422	3.076	1.052	234	3.068	1.136	188	3.085	0.938
Answer	1-5	423	2.967	1.039	234	2.987	1.125	189	2.942	0.924
Fair	1-5	422	3.934	0.777	233	4.163	0.713	189	3.651	0.761
CalledOn	1-5	423	3.111	1.066	234	3.128	1.150	189	3.090	0.955
Focus	1-5	422	3.713	0.813	233	3.854	0.828	189	3.540	0.761
Visualaids	1-5	421	3.670	0.827	232	3.797	0.867	189	3.513	0.748
Stories	1-5	421	3.758	0.818	233	3.970	0.833	188	3.495	0.720
Classroom	1-5	423	2.345	0.865	234	2.303	0.892	189	2.397	0.829
Distract	1-5	423	2.570	0.978	234	2.479	1.028	189	2.683	0.902
ExpAttendance	0-4	423	0.196	0.474	234	0.197	0.449	189	0.196	0.504
ExpGrade	0-4	423	3.771	0.508	234	3.812	0.413	189	3.720	0.602

Table III-11. Final Matched Evaluations Summary Statistics: Mean, Standard Deviation, and Data Range

		All Courses			Upper Division Courses			Lower Division Courses		
Variable	Data Range	N	Mean	Standard Deviation	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Dependent Variables										
InstrOverall	0-4	423	3.563	0.685	234	3.538	0.742	189	3.593	0.609
CourseOverall	1-5	422	4.308	0.833	233	4.335	0.856	189	4.275	0.805
Course Improved	1-5	418	3.907	1.101	230	3.830	1.160	188	4.000	1.019
Instructor Improved	1-5	415	4.099	1.011	229	4.052	1.058	186	4.156	0.949
Recommend Instructor to Friend	1-5	422	4.341	0.868	233	4.339	0.915	189	4.344	0.808
Recommend Course to Friend	1-5	421	4.128	1.004	232	4.172	1.030	189	4.074	0.970
Student Characteristics										
Gender	0-1	423	0.624	0.485	234	0.603	0.490	189	0.651	0.478
College	0-1	423	0.976	0.152	234	0.983	0.130	189	0.968	0.176
Class	0-4	423	1.917	1.133	234	2.577	0.678	189	1.101	1.050
Purpose	0-3	423	2.317	0.840	234	2.333	0.874	189	2.296	0.797
Required	0-1	422	0.808	0.394	233	0.695	0.461	189	0.947	0.224
Type	0-4	422	3.929	0.315	233	3.936	0.246	189	3.921	0.385
Transferred Hours	0-7	419	2.396	2.607	234	2.752	2.781	185	1.946	2.298
OSU Semesters	0-60	422	4.031	4.610	233	5.150	4.402	189	2.651	4.495
Male Evaluating Male	0-1	423	0.322	0.468	234	0.372	0.484	189	0.259	0.439
Male Evaluating Female	0-1	423	0.054	0.227	234	0.026	0.158	189	0.090	0.287
Female Evaluating Male	0-1	423	0.426	0.495	234	0.393	0.489	189	0.466	0.500
Female Evaluating Female	0-1	423	0.199	0.399	234	0.209	0.408	189	0.185	0.389
Instructor Characteristics										
Prep	0-4	423	3.532	0.677	234	3.509	0.737	189	3.561	0.595

Table III-11. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
TeachEffort	0-4	423	3.603	0.641	234	3.568	0.704	189	3.646	0.552
Present	0-4	423	3.284	0.873	234	3.261	0.952	189	3.312	0.767
Knowledge	0-4	423	3.667	0.638	234	3.598	0.730	189	3.751	0.491
Explain	0-4	423	3.418	0.825	234	3.376	0.915	189	3.471	0.696
Attitude	0-4	423	3.645	0.647	234	3.654	0.658	189	3.635	0.635
Full Professor	0-1	423	0.622	0.486	234	0.534	0.500	189	0.730	0.445
Associate Professor	0-1	423	0.083	0.276	234	0.150	0.357	189	0.000	0.000
Assistant Professor	0-1	423	0.270	0.444	234	0.316	0.466	189	0.212	0.410
Instructor	0-1	423	0.026	0.159	234	0.000	0.000	189	0.058	0.235
InstGender	0-1	423	0.253	0.435	234	0.235	0.425	189	0.275	0.448
Course Characteristics										
Learned a lot	1-5	422	4.261	0.846	233	4.262	0.898	189	4.259	0.780
Workload	1-5	422	4.256	0.730	233	4.270	0.777	189	4.238	0.670
Assignments	1-5	422	4.265	0.774	233	4.288	0.819	189	4.238	0.716
Tests	1-5	419	4.169	0.898	230	4.204	0.928	189	4.127	0.860
Involve	1-5	422	4.313	0.697	233	4.399	0.707	189	4.206	0.672
Worthwhile	1-5	421	4.200	0.917	233	4.249	0.950	188	4.138	0.873
Class size	6-220	423	100.955	78.136	234	48.132	28.474	189	166.354	70.190
Upper Division Course	0-1	423	0.553	0.498	234	1.000	0.000	189	0.000	0.000
Lower Division Course	0-1	423	0.447	0.498	234	0.000	0.000	189	1.000	0.000
Time	0-1	423	0.423	0.495	234	0.483	0.501	189	0.349	0.478
New Course	0-1	423	0.035	0.185	234	0.064	0.245	189	0.000	0.000
Beginning	0-1	423	0.617	0.487	234	0.658	0.475	189	0.566	0.497
End	0-1	423	0.383	0.487	234	0.342	0.475	189	0.434	0.497

Table III-11. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Student Views										
Syllabus	1-5	421	4.264	0.771	232	4.211	0.839	189	4.328	0.675
ActiveInvolve	1-5	420	4.107	0.888	232	4.228	0.928	188	3.957	0.813
Entertain	1-5	422	4.277	0.928	233	4.283	0.999	189	4.270	0.836
Ask	1-5	415	3.014	1.230	229	2.904	1.260	186	3.151	1.180
Answer	1-5	413	3.150	1.270	226	3.071	1.280	187	3.246	1.254
Fair	1-5	422	4.358	0.753	233	4.403	0.731	189	4.302	0.778
CalledOn	1-5	418	3.251	1.257	229	3.183	1.278	189	3.333	1.229
Focus	1-5	421	3.943	1.008	232	4.013	0.969	189	3.857	1.050
Visualaids	1-5	418	4.105	0.905	230	4.122	0.941	188	4.085	0.861
Stories	1-5	415	4.070	0.923	228	4.171	0.920	187	3.947	0.914
Classroom	1-5	404	2.101	1.079	221	2.199	1.143	183	1.984	0.986
Distract	1-5	398	2.430	1.181	220	2.414	1.211	178	2.449	1.145
ExpAttendance	0-4	417	0.484	0.750	228	0.447	0.697	189	0.529	0.809
ExpGrade	0-4	418	3.438	0.691	232	3.539	0.643	186	3.312	0.728

Table III-12. Initial Unmatched Evaluations Summary Statistics: Mean, Standard Deviation, and Data Range

		All Courses			Upper Division Courses			Lower Division Courses		
Variable	Data Range	N	Mean	Standard Deviation	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Dependent Variables										
InstrOverall	0-4	438	3.495	0.712	206	3.646	0.564	232	3.362	0.799
CourseOverall	1-5	431	3.803	0.790	205	3.951	0.803	226	3.668	0.755
Student Characteristics										
Gender	0-1	442	0.473	0.500	208	0.486	0.501	234	0.462	0.500
College	0-1	442	0.939	0.240	208	0.995	0.069	234	0.889	0.315
Class	0-4	442	1.968	1.030	208	2.620	0.602	234	1.389	0.984
Purpose	0-3	442	2.314	0.724	208	2.370	0.717	234	2.265	0.728
Required	0-1	442	0.824	0.382	208	0.740	0.439	234	0.897	0.304
Type	0-4	442	3.869	0.505	208	3.909	0.446	234	3.833	0.550
PrevCourse	0-1	439	0.294	0.456	205	0.439	0.497	234	0.167	0.373
PrevInstr	0-1	441	0.113	0.317	207	0.208	0.407	234	0.030	0.171
Ratings	0-1	441	0.138	0.346	208	0.135	0.342	233	0.142	0.349
CourseValue	0-2	440	0.814	0.762	208	0.702	0.734	232	0.914	0.774
Male Evaluating Male	0-1	442	0.434	0.496	208	0.471	0.500	234	0.402	0.491
Male Evaluating Female	0-1	442	0.093	0.290	208	0.043	0.204	234	0.137	0.344
Female Evaluating Male	0-1	442	0.326	0.469	208	0.370	0.484	234	0.286	0.453
Female Evaluating Female	0-1	442	0.147	0.355	208	0.115	0.320	234	0.175	0.381
Instructor Characteristics										
Prep	0-4	440	3.332	0.726	208	3.433	0.663	232	3.241	0.769
TeachEffort	0-4	439	3.421	0.697	207	3.556	0.596	232	3.302	0.758
Present	0-4	438	3.388	0.744	206	3.519	0.622	232	3.272	0.821
Knowledge	0-4	438	3.219	0.790	206	3.330	0.744	232	3.121	0.818
Explain	0-4	438	3.525	0.679	206	3.558	0.636	232	3.496	0.715

Table III-12. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Attitude	0-4	438	3.253	0.802	206	3.364	0.745	232	3.155	0.839
Full Professor	0-1	442	0.645	0.479	208	0.601	0.491	234	0.684	0.466
Associate Professor	0-1	442	0.059	0.236	208	0.125	0.332	234	0.000	0.000
Assistant Professor	0-1	442	0.258	0.438	208	0.274	0.447	234	0.244	0.430
Instructor	0-1	442	0.038	0.193	208	0.000	0.000	234	0.073	0.260
InstGender	0-1	442	0.240	0.427	208	0.159	0.366	234	0.312	0.464
Course Characteristics										
Workload	1-5	438	3.635	0.780	207	3.787	0.772	231	3.498	0.763
Assignments	1-5	439	3.674	0.771	208	3.846	0.796	231	3.519	0.715
Tests	1-5	438	3.532	0.743	207	3.662	0.777	231	3.416	0.692
Involve	1-5	437	3.778	0.789	206	3.951	0.782	231	3.623	0.764
Worthwhile	1-5	439	3.882	0.794	208	4.014	0.801	231	3.762	0.769
Class size	6-230	442	109.557	77.639	208	52.760	29.008	234	160.043	72.261
Upper Division Course	0-1	442	0.471	0.500	208	1.000	0.000	234	0.000	0.000
Lower Division Course	0-1	442	0.529	0.500	208	0.000	0.000	234	1.000	0.000
Time	0-1	442	0.410	0.492	208	0.399	0.491	234	0.419	0.494
New Course	0-1	442	0.018	0.133	208	0.038	0.193	234	0.000	0.000
Day	1-5	442	2.905	1.045	208	3.034	1.127	234	2.791	0.956
Beginning	0-1	442	0.894	0.309	208	0.774	0.419	234	1.000	0.000
Middle	0-1	442	0.014	0.116	208	0.029	0.168	234	0.000	0.000
End	0-1	442	0.093	0.290	208	0.197	0.399	234	0.000	0.000
Student Views										
TeachStyle	1-5	403	3.295	0.964	190	3.479	1.032	213	3.131	0.870
OneSection	1-5	396	1.343	0.847	185	1.443	0.813	211	1.256	0.868
FriendRec	1-5	371	2.962	1.039	175	2.966	1.088	196	2.959	0.997

Table III-12. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
WebRec	1-5	369	2.612	0.865	174	2.609	0.898	195	2.615	0.838
ProfRec	1-5	373	2.839	1.040	177	2.949	1.109	196	2.740	0.965
SubInterest	1-5	372	3.578	0.967	177	3.831	0.956	195	3.349	0.920
Goodgrade	1-5	366	2.801	1.034	174	2.874	1.151	192	2.734	0.914
Syllabus	1-5	421	3.679	0.872	199	3.844	0.882	222	3.532	0.838
ActiveInvolve	1-5	436	3.778	0.807	206	4.010	0.808	230	3.570	0.749
Entertain	1-5	434	4.035	0.847	205	4.312	0.798	229	3.786	0.812
Ask	1-5	436	3.206	1.105	206	3.136	1.182	230	3.270	1.031
Answer	1-5	435	3.163	1.123	204	3.123	1.203	231	3.199	1.048
Fair	1-5	435	3.924	0.821	205	4.122	0.846	230	3.748	0.757
CalledOn	1-5	437	3.307	1.130	206	3.252	1.215	231	3.355	1.049
Focus	1-5	437	3.785	0.875	206	3.908	0.914	231	3.675	0.825
Visualaids	1-5	434	3.737	0.889	204	3.907	0.897	230	3.587	0.856
Stories	1-5	434	3.783	0.893	204	4.039	0.870	230	3.557	0.853
Classroom	1-5	434	2.567	1.045	203	2.493	1.078	231	2.632	1.012
Distract	1-5	433	2.811	1.017	202	2.703	1.051	231	2.905	0.978
ExpAttendance	0-4	435	0.285	0.612	203	0.320	0.646	232	0.254	0.581
ExpGrade	0-4	437	3.613	0.645	204	3.657	0.525	233	3.575	0.734

Table III-13. Final Unmatched Evaluations Summary Statistics: Mean, Standard Deviation, and Data Range

		All Courses			Upper Division Courses			Lower Division Courses		
Variable	Data Range	N	Mean	Standard Deviation	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Dependent Variables										
InstrOverall	0-4	405	3.514	0.750	175	3.531	0.779	230	3.500	0.728
CourseOverall	1-5	406	4.180	0.908	176	4.205	0.952	230	4.161	0.874
Course Improved	1-5	407	3.717	1.210	176	3.722	1.295	231	3.714	1.144
Instructor Improved	1-5	407	3.926	1.147	176	3.915	1.223	231	3.935	1.088
Recommend Instructor to Friend	1-5	407	4.290	0.928	176	4.335	0.954	231	4.255	0.909
Recommend Course to Friend	1-5	406	4.017	1.085	175	4.137	1.100	231	3.926	1.067
Student Characteristics										
College	0-1	407	0.943	0.231	176	0.960	0.196	231	0.931	0.254
Class	0-4	407	1.885	1.111	176	2.653	0.667	231	1.299	1.022
Purpose	0-3	406	2.281	0.820	175	2.320	0.831	231	2.251	0.811
Required	0-1	405	0.822	0.383	175	0.703	0.458	230	0.913	0.282
Type	0-4	402	3.925	0.315	175	3.880	0.419	227	3.960	0.196
Transferred Hours	0-7	401	2.668	2.621	172	3.110	2.831	229	2.336	2.405
OSU Semesters	0-14	406	3.651	2.584	175	4.774	2.794	231	2.801	2.042
Instructor Characteristics										
Prep	0-4	406	3.515	0.698	176	3.511	0.771	230	3.517	0.639
TeachEffort	0-4	406	3.579	0.657	176	3.585	0.720	230	3.574	0.607
Present	0-4	406	3.296	0.884	176	3.330	0.935	230	3.270	0.844
Knowledge	0-4	406	3.680	0.637	176	3.614	0.724	230	3.730	0.558
Explain	0-4	405	3.353	0.874	176	3.375	0.911	229	3.336	0.846
Attitude	0-4	406	3.569	0.719	176	3.631	0.689	230	3.522	0.740
Full Professor	0-1	407	0.666	0.472	176	0.608	0.490	231	0.710	0.455

Table III-13. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Associate Professor	0-1	407	0.064	0.245	176	0.148	0.356	231	0.000	0.000
Assistant Professor	0-1	407	0.238	0.427	176	0.244	0.431	231	0.234	0.424
Instructor	0-1	407	0.032	0.176	176	0.000	0.000	231	0.056	0.231
InstrGender	0-1	407	0.233	0.424	176	0.159	0.367	231	0.290	0.455
Course Characteristics										
Learned a lot	1-5	407	4.167	0.875	176	4.176	0.937	231	4.160	0.826
Workload	1-5	407	4.170	0.867	176	4.176	0.937	231	4.165	0.812
Assignments	1-5	407	4.162	0.856	176	4.199	0.932	231	4.134	0.794
Tests	1-5	407	4.098	0.918	176	4.182	0.920	231	4.035	0.913
Involve	1-5	407	4.165	0.806	176	4.273	0.796	231	4.082	0.806
Worthwhile	1-5	407	4.071	1.006	176	4.097	1.062	231	4.052	0.963
Class size	6-220	407	110.998	74.617	176	51.540	27.942	231	156.299	66.843
Upper Division Course	0-1	407	0.432	0.496	176	1.000	0.000	231	0.000	0.000
Lower Division Course	0-1	407	0.568	0.496	176	0.000	0.000	231	1.000	0.000
Time	0-1	407	0.396	0.490	176	0.426	0.496	231	0.372	0.484
New Course	0-1	407	0.027	0.162	176	0.063	0.243	231	0.000	0.000
Beginning	0-1	407	0.570	0.496	176	0.710	0.455	231	0.463	0.500
End	0-1	407	0.430	0.496	176	0.290	0.455	231	0.537	0.500
Student Views										
Syllabus	1-5	407	4.147	0.820	176	4.233	0.853	231	4.082	0.790
ActiveInvolve	1-5	406	4.054	0.909	176	4.210	0.923	230	3.935	0.882
Entertain	1-5	406	4.163	0.970	176	4.199	1.069	230	4.135	0.889
Ask	1-5	405	3.086	1.192	175	3.017	1.315	230	3.139	1.089
Answer	1-5	404	3.196	1.176	175	3.103	1.305	229	3.266	1.065
Fair	1-5	406	4.340	0.765	176	4.420	0.736	230	4.278	0.782

Table III-13. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
CalledOn	1-5	405	3.286	1.182	175	3.206	1.314	230	3.348	1.070
Focus	1-5	406	3.899	0.980	176	3.966	1.036	230	3.848	0.934
Visualaids	1-5	405	4.047	0.962	175	4.143	0.975	230	3.974	0.948
Stories	1-5	406	3.941	0.990	176	4.034	1.090	230	3.870	0.901
Classroom	1-5	405	2.358	1.178	175	2.337	1.276	230	2.374	1.101
Distract	1-5	403	2.697	1.192	175	2.651	1.250	228	2.732	1.147
ExpAttendance	0-4	400	0.515	0.749	174	0.569	0.821	226	0.473	0.687
ExpGrade	0-4	407	3.145	0.789	176	3.239	0.771	231	3.074	0.796

Table III-14. Matched Final Evaluations who Completed Control Questionnaires: Mean, Standard Deviation, and Data Range[a]

		All Courses			Upper Division Courses			Lower Division Courses		
Variable	Data Range	N	Mean	Standard Deviation	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Dependent Variables										
InstrOverall	0-4	67	3.687	0.556	11	3.909	0.302	56	3.643	0.586
CourseOverall	1-5	67	4.328	0.533	11	4.545	0.522	56	4.286	0.530
Course Improved	1-5	66	4.136	0.762	11	4.364	0.505	55	4.091	0.800
Instructor Improved	1-5	67	4.194	0.783	11	4.364	0.505	56	4.161	0.826
Recommend Instructor to Friend	1-5	67	4.433	0.679	11	4.727	0.467	56	4.375	0.702
Recommend Course to Friend	1-5	67	4.328	0.613	11	4.636	0.505	56	4.268	0.618
Student Characteristics										
Gender	0-1	67	0.731	0.447	11	0.636	0.505	56	0.750	0.437
College	0-1	67	0.910	0.288	11	0.909	0.302	56	0.911	0.288
Class	0-4	67	0.806	0.957	11	2.091	0.539	56	0.554	0.807
Purpose	0-3	67	2.522	0.785	11	2.364	0.924	56	2.554	0.761
Required	0-1	66	0.939	0.240	10	0.900	0.316	56	0.946	0.227
Type	0-4	67	3.866	0.575	11	4.000	0.000	56	3.839	0.626
Ratings[b]	0-1	67	0.149	0.359	11	0.091	0.302	56	0.161	0.371
CourseValue[b]	0-2	67	0.597	0.780	11	0.364	0.674	56	0.643	0.796
Transferred Hours	0-7	67	1.418	1.932	11	3.091	2.773	56	1.089	1.552
OSU Semesters	0-7	67	2.075	1.627	10	3.800	1.317	56	1.804	1.482
Male Evaluating Male	0-1	67	0.269	0.447	11	0.364	0.505	56	0.250	0.437
Male Evaluating Female	0-1	67	0.000	0.000	11	0.000	0.000	56	0.000	0.000
Female Evaluating Male	0-1	67	0.701	0.461	11	0.636	0.505	56	0.714	0.456
Female Evaluating Female	0-1	67	0.030	0.171	11	0.000	0.000	56	0.036	0.187

Table III-14. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Instructor Characteristics										
Prep	0-4	67	3.687	0.528	11	3.818	0.405	56	3.661	0.549
TeachEffort	0-4	67	3.716	0.486	11	3.818	0.405	56	3.696	0.502
Present	0-4	67	3.507	0.637	11	3.818	0.405	56	3.446	0.658
Knowledge	0-4	67	3.761	0.495	11	3.818	0.405	56	3.750	0.513
Explain	0-4	67	3.582	0.581	11	3.727	0.467	56	3.554	0.601
Attitude	0-4	67	3.537	0.876	11	3.818	0.405	56	3.482	0.934
Full Professor	0-1	67	0.970	0.171	11	1.000	0.000	56	0.964	0.187
Associate Professor	0-1	67	0.000	0.000	11	0.000	0.000	56	0.000	0.000
Assistant Professor	0-1	67	0.030	0.171	11	0.000	0.000	56	0.036	0.187
Instructor	0-1	67	0.000	0.000	11	0.000	0.000	56	0.000	0.000
InstrGender	0-1	67	0.030	0.171	11	0.000	0.000	56	0.036	0.187
Course Characteristics										
Learned a lot	1-5	67	4.284	0.755	11	4.364	0.924	56	4.268	0.726
Workload	1-5	67	4.254	0.636	11	4.364	0.924	56	4.232	0.572
Assignments	1-5	66	4.364	0.545	11	4.364	0.674	55	4.364	0.522
Tests	1-5	66	4.152	0.685	10	3.900	1.101	56	4.196	0.585
Involve	1-5	67	4.030	0.758	11	4.091	0.944	56	4.018	0.726
Worthwhile	1-5	67	4.224	0.755	11	4.182	0.982	56	4.232	0.713
Class size	90-220	67	189.104	50.557	11	100.000	0.000	56	206.607	34.167
Upper Division Course	0-1	67	0.164	0.373	11	1.000	0.000	56	0.000	0.000
Lower Division Course	0-1	67	0.836	0.373	11	0.000	0.000	56	1.000	0.000
Time	0-1	67	0.224	0.420	11	0.000	0.000	56	0.268	0.447
Beginning	0-1	67	0.746	0.438	11	1.000	0.000	56	0.696	0.464
End	0-1	67	0.254	0.438	11	0.000	0.000	56	0.304	0.464

Table III-14. Cont.

Variable	Data Range	All Courses N	All Courses Mean	All Courses Standard Deviation	Upper Division Courses N	Upper Division Courses Mean	Upper Division Courses Standard Deviation	Lower Division Courses N	Lower Division Courses Mean	Lower Division Courses Standard Deviation
Student Views										
Syllabus	1-5	67	4.328	0.660	11	4.545	0.522	56	4.286	0.680
ActiveInvolve	1-5	66	3.879	0.953	11	4.273	0.647	55	3.800	0.989
Entertain	1-5	67	4.418	0.801	11	4.727	0.467	56	4.357	0.841
Ask	1-5	65	3.169	1.140	10	3.100	1.287	55	3.182	1.124
Answer	1-5	65	3.415	1.130	10	3.100	1.287	55	3.473	1.103
Fair	1-5	67	4.284	0.755	11	4.727	0.467	56	4.196	0.773
CalledOn	1-5	65	3.446	1.186	10	3.100	1.287	55	3.509	1.169
Focus	1-5	67	3.896	0.890	11	4.182	0.874	56	3.839	0.890
Visualaids	1-5	65	4.031	1.045	10	4.500	0.527	55	3.945	1.096
Stories	1-5	65	4.138	0.827	11	4.545	0.522	54	4.056	0.856
Classroom	1-5	64	1.984	1.046	10	2.700	1.337	54	1.852	0.940
Distract	1-5	63	2.460	1.119	10	2.300	1.337	53	2.491	1.085
ExpAttendance	0-4	64	0.438	0.710	10	0.700	0.949	54	0.389	0.656
ExpGrade	0-4	67	3.284	0.735	11	3.636	0.674	56	3.214	0.731

[a] This table includes values for only those evaluations that were successfully matched to a control questionnaire at the beginning of the semester.

[b] These questions were asked at the beginning of the semester and averages reflect responses of students who completed the control questionnaire and the evaluation at the end of the semester.

Table III-15. Comparison of Means for All Collected Questionnaire Types for All Courses

	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Dependent Variables								
InstrOverall	3.495	0.712	3.504	0.708	3.563	0.685	3.514	0.750
CourseOverall	3.803	0.790	3.745	0.756	4.308[a, b]	0.833	4.180[a, c]	0.908
Course Improved	---	---	---	---	3.907	1.101	3.717[c]	1.210
Instructor Improved	---	---	---	---	4.099	1.011	3.926[c]	1.147
Recommend Instructor to Friend	---	---	---	---	4.341	0.868	4.290	0.928
Recommend Course to Friend	---	---	---	---	4.128	1.004	4.017	1.085
Student Characteristics								
Gender	0.473	0.500	0.624[a]	0.485	0.624[a]	0.485	---	---
College	0.939	0.240	0.962	0.191	0.976[a]	0.152	0.943[c]	0.231
Class	1.968	1.030	1.910	1.138	1.917	1.133	1.885	1.111
Purpose	2.314	0.724	2.340	0.771	2.317	0.840	2.281	0.820
Required	0.824	0.382	0.813	0.390	0.808	0.394	0.822	0.383
Type	3.869	0.505	3.917	0.365	3.929[a]	0.315	3.925[a]	0.315
PrevCourse	0.294	0.456	0.313	0.464	---	---	---	---
PrevInstr	0.113	0.317	0.152	0.359	---	---	---	---
Ratings	0.138	0.346	0.113	0.318	---	---	---	---
CourseValue	0.814	0.762	0.844	0.775	---	---	---	---
Transferred Hours	---	---	---	---	2.396	2.607	2.668	2.621
OSU Semesters	---	---	---	---	4.031	4.610	3.651	2.584
Male Evaluating Male	0.434	0.496	0.322[a]	0.468	0.322[a]	0.468	---	---
Male Evaluating Female	0.093	0.290	0.054[a]	0.227	0.054[a]	0.227	---	---
Female Evaluating Male	0.326	0.469	0.426[a]	0.495	0.426[a]	0.495	---	---

Table III-15. Cont.

Variable	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Female Evaluating Female	0.147	0.355	0.199[a]	0.399	0.199[a]	0.399	---	---
Instructor Characteristics								
Prep	3.332	0.726	3.322	0.735	3.532[a, b]	0.677	3.515[a]	0.698
TeachEffort	3.421	0.697	3.423	0.694	3.603[a, b]	0.641	3.579[a]	0.657
Present	3.388	0.744	3.390	0.693	3.284[b]	0.873	3.296	0.884
Knowledge	3.219	0.790	3.165	0.792	3.667[a, b]	0.638	3.680[a]	0.637
Explain	3.525	0.679	3.550	0.651	3.418[a, b]	0.825	3.353[a]	0.874
Attitude	3.253	0.802	3.322	0.735	3.645[a, b]	0.647	3.569[a]	0.719
Full Professor	0.645	0.479	0.622	0.486	0.622	0.486	0.666	0.472
Associate Professor	0.059	0.236	0.083	0.276	0.083	0.276	0.064	0.245
Assistant Professor	0.258	0.438	0.270	0.444	0.270	0.444	0.238	0.427
Instructor	0.038	0.193	0.026	0.159	0.026	0.159	0.032	0.176
InstGender	0.240	0.427	0.253	0.435	0.253	0.435	0.233	0.424
Course Characteristics								
Learned a lot	---	---	---	---	4.261	0.846	4.167	0.875
Workload	3.635	0.780	3.641	0.737	4.256[a, b]	0.730	4.170[a]	0.867
Assignments	3.674	0.771	3.641	0.744	4.265[a, b]	0.774	4.162[a]	0.856
Tests	3.532	0.743	3.393[a]	0.666	4.169[a, b]	0.898	4.098[a]	0.918
Involve	3.778	0.789	3.768	0.740	4.313[a, b]	0.697	4.165[a, c]	0.806
Worthwhile	3.882	0.794	3.815	0.782	4.200[a, b]	0.917	4.071[a]	1.006
Class size	109.557	77.639	104.116	80.818	100.955[b]	78.136	110.998	74.617
Upper Division Course	0.471	0.500	0.553[a]	0.498	0.553[a]	0.498	0.432[c]	0.496
Lower Division Course	0.529	0.500	0.447[a]	0.498	0.447[a]	0.498	0.568[c]	0.496

Table III-15. Cont.

Variable		Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
		Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
	Time	0.410	0.492	0.423	0.495	0.423	0.495	0.396	0.490
	New Course	0.018	0.133	0.035	0.185	0.035	0.185	0.027	0.162
	Day	2.905	1.045	2.905	1.073	---	---	---	---
	Beginning	0.894	0.309	0.891	0.312	0.617[a, b]	0.487	0.570[a]	0.496
	Middle	0.014	0.116	0.026	0.159	---	---	---	---
	End	0.093	0.290	0.083	0.276	0.383[a, b]	0.487	0.430[a]	0.496
Student Views									
	TeachStyle	3.295	0.964	3.244	0.922	---	---	---	---
	OneSection	1.343	0.847	1.322	0.861	---	---	---	---
	FriendRec	2.962	1.039	2.984	1.046	---	---	---	---
	WebRec	2.612	0.865	2.550	0.831	---	---	---	---
	ProfRec	2.839	1.040	2.821	0.981	---	---	---	---
	SubInterest	3.578	0.967	3.540	0.973	---	---	---	---
	Goodgrade	2.801	1.034	2.725	0.913	---	---	---	---
	Syllabus	3.679	0.872	3.672	0.794	4.264[a, b]	0.771	4.147[a, c]	0.820
	ActiveInvolve	3.778	0.807	3.768	0.778	4.107[a, b]	0.888	4.054[a]	0.909
	Entertain	4.035	0.847	4.026	0.841	4.277[a, b]	0.928	4.163[a]	0.970
	Ask	3.206	1.105	3.076	1.052	3.014[a]	1.230	3.086	1.192
	Answer	3.163	1.123	2.967[a]	1.039	3.150[a, b]	1.270	3.196	1.176
	Fair	3.924	0.821	3.934	0.777	4.358[b]	0.753	4.340[a]	0.765
	CalledOn	3.307	1.130	3.111[a]	1.066	3.251[b]	1.257	3.286	1.182
	Focus	3.785	0.875	3.713	0.813	3.943[a, b]	1.008	3.899[a]	0.980
	Visualaids	3.737	0.889	3.670	0.827	4.105[a, b]	0.905	4.047[a]	0.962
	Stories	3.783	0.893	3.758	0.818	4.070[a, b]	0.923	3.941[a]	0.990
	Classroom	2.567	1.045	2.345[a]	0.865	2.101[a, b]	1.079	2.358[a, c]	1.178

Table III-15. Cont.

Variable	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distract	2.811	1.017	2.570[a]	0.978	2.430[a, b]	1.181	2.697[a,c]	1.192
ExpAttendance	0.285	0.612	0.196[a]	0.474	0.484[a, b]	0.750	0.515[a]	0.749
ExpGrade	3.613	0.645	3.771[a]	0.508	3.438[a, b]	0.691	3.145[a, c]	0.789

[a] Mean is significantly different from corresponding mean in unmatched initial evaluation column at the 5% level
[b] Mean is significantly different from corresponding mean in matched initial evaluation column at the 5% level
[c] Mean is significantly different from corresponding mean in final matched evaluation column at the 5% level

Table III-16. Comparison of Means for All Collected Questionnaire Types in Upper Division Courses

	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Dependent Variables								
InstrOverall	3.646	0.564	3.654	0.552	3.538[b]	0.742	3.531	0.779
CourseOverall	3.951	0.803	3.897	0.792	4.335[a, b]	0.856	4.205[a]	0.952
Course Improved	---	---	---	---	3.830	1.160	3.722	1.295
Instructor Improved	---	---	---	---	4.052	1.058	3.915	1.223
Recommend Instructor to Friend	---	---	---	---	4.339	0.915	4.335	0.954
Recommend Course to Friend	---	---	---	---	4.172	1.030	4.137	1.100
Student Characteristics								
Gender	0.486	0.501	0.603[a]	0.490	0.603[a]	0.490	---	---
College	0.995	0.069	0.987	0.113	0.983	0.130	0.960[c]	0.196
Class	2.620	0.602	2.568	0.704	2.577	0.678	2.653[c]	0.667
Purpose	2.370	0.717	2.308	0.802	2.333	0.874	2.320	0.831
Required	0.740	0.439	0.714	0.453	0.695	0.461	0.703[c]	0.458
Type	3.909	0.446	3.936	0.334	3.936	0.246	3.880	0.419
PrevCourse	0.439	0.497	0.442	0.498	---	---	---	---
PrevInstr	0.208	0.407	0.258	0.438	---	---	---	---
Ratings	0.135	0.342	0.094	0.292	---	---	---	---
CourseValue	0.702	0.734	0.675	0.751	---	---	---	---
Transferred Hours	---	---	---	---	2.752	2.781	3.110	2.831
OSU Semesters	---	---	---	---	5.150	4.402	4.774	2.794
Male Evaluating Male	0.471	0.500	0.372[a]	0.484	0.372[a]	0.484	---	---
Male Evaluating Female	0.043	0.204	0.026	0.158	0.026	0.158	---	---
Female Evaluating Male	0.370	0.484	0.393	0.489	0.393	0.489	---	---

Table III-16. Cont.

	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Female Evaluating Female	0.115	0.320	0.209[a]	0.408	0.209[a]	0.408	---	---
Instructor Characteristics								
Prep	3.433	0.663	3.410	0.713	3.509	0.737	3.511	0.771
TeachEffort	3.556	0.596	3.491	0.650	3.568	0.704	3.585	0.720
Present	3.519	0.622	3.521	0.623	3.261[a, b]	0.952	3.330[a]	0.935
Knowledge	3.330	0.744	3.256	0.777	3.598[a, b]	0.730	3.614[a]	0.724
Explain	3.558	0.636	3.592	0.581	3.376[a, b]	0.915	3.375[a]	0.911
Attitude	3.364	0.745	3.410	0.713	3.654[a, b]	0.658	3.631[a]	0.689
Full Professor	0.601	0.491	0.534	0.500	0.534	0.500	0.608	0.490
Associate Professor	0.125	0.332	0.150	0.357	0.150	0.357	0.148	0.356
Assistant Professor	0.274	0.447	0.316	0.466	0.316	0.466	0.244	0.431
Instructor	---	---	---	---	---	---	---	---
InstGender	0.159	0.366	0.235[a]	0.425	0.235[a]	0.425	0.159	0.367
Course Characteristics								
Learned a lot	---	---	---	---	4.262	0.898	4.176[a]	0.937
Workload	3.787	0.772	3.825	0.769	4.270[a, b]	0.777	4.176[a]	0.937
Assignments	3.846	0.796	3.833	0.782	4.288[a, b]	0.819	4.199[a]	0.932
Tests	3.662	0.777	3.536	0.731	4.204[a, b]	0.928	4.182[a]	0.920
Involve	3.951	0.782	4.000	0.718	4.399[a, b]	0.707	4.273[a]	0.796
Worthwhile	4.014	0.801	3.996	0.807	4.249[a, b]	0.950	4.097[a]	1.062
Class size	52.760	29.008	48.662	28.065	48.132[b]	28.474	51.540	27.942
Upper Division Course	1.000	0.000	1.000	0.000	1.000	0.000	1.000	0.000
Lower Division Course	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Time	0.399	0.491	0.483	0.501	0.483	0.501	0.426	0.496

Table III-16. Cont.

	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
New Course	0.038	0.193	0.064	0.245	0.064	0.245	0.063	0.243
Day	3.034	1.127	3.124	1.152	---	---	---	---
Beginning	0.774	0.419	0.803	0.398	0.658[a, b]	0.475	0.710	0.455
Middle	0.029	0.168	0.047	0.212	---	---	---	---
End	0.197	0.399	0.150	0.357	0.342[a, b]	0.475	0.290[a]	0.455
Student Views								
TeachStyle	3.479	1.032	3.422	1.069	---	---	---	---
OneSection	1.443	0.813	1.488	0.805	---	---	---	---
FriendRec	2.966	1.088	3.040	1.144	---	---	---	---
WebRec	2.609	0.898	2.467	0.904	---	---	---	---
ProfRec	2.949	1.109	2.832	1.087	---	---	---	---
SubInterest	3.831	0.956	3.745	1.032	---	---	---	---
Goodgrade	2.874	1.151	2.759	1.004	---	---	---	---
Syllabus	3.844	0.882	3.839	0.806	4.211[a, b]	0.839	4.233[a]	0.853
ActiveInvolve	4.010	0.808	4.009	0.747	4.228[a, b]	0.928	4.210[a]	0.923
Entertain	4.312	0.798	4.270	0.815	4.283[a]	0.999	4.199[a]	1.069
Ask	3.136	1.182	3.068	1.136	2.904[a]	1.260	3.017	1.315
Answer	3.123	1.203	2.987	1.125	3.071	1.280	3.103	1.305
Fair	4.122	0.846	4.163	0.713	4.403[a, b]	0.731	4.420[a]	0.736
CalledOn	3.252	1.215	3.128	1.150	3.183	1.278	3.206	1.314
Focus	3.908	0.914	3.854	0.828	4.013[b]	0.969	3.966	1.036
Visualaids	3.907	0.897	3.797	0.867	4.122[a, b]	0.941	4.143[a]	0.975
Stories	4.039	0.870	3.970	0.833	4.171[b]	0.920	4.034	1.090
Classroom	2.493	1.078	2.303[a]	0.892	2.199[a]	1.143	2.337	1.276

Table III-16. Cont.

	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distract	2.703	1.051	2.479[a]	1.028	2.414[a]	1.211	2.651	1.250
ExpAttendance	0.320	0.646	0.197[a]	0.449	0.447[a, b]	0.697	0.569[a]	0.821
ExpGrade	3.657	0.525	3.812[a]	0.413	3.539[a, b]	0.643	3.239[a, c]	0.771

[a] Mean is significantly different from corresponding mean in unmatched initial evaluation column at the 5% level
[b] Mean is significantly different from corresponding mean in matched initial evaluation column at the 5% level
[c] Mean is significantly different from corresponding mean in final matched evaluation column at the 5% level

Table III-17. Comparison of Means for All Collected Questionnaire Types in Lower Division Courses

	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Dependent Variables								
InstrOverall	3.362	0.799	3.317	0.828	3.593[a, b]	0.609	3.500	0.728
CourseOverall	3.668	0.755	3.556	0.665	4.275[a, b]	0.805	4.161[a]	0.874
Course Improved	---	---	---	---	4.000	1.019	3.714[c]	1.144
Instructor Improved	---	---	---	---	4.156	0.949	3.935[c]	1.088
Recommend Instructor to Friend	---	---	---	---	4.344	0.808	4.255	0.909
Recommend Course to Friend	---	---	---	---	4.074	0.970	3.926	1.067
Student Characteristics								
Gender	0.462	0.500	0.651[a]	0.478	0.651[a]	0.478	---	---
College	0.889	0.315	0.931	0.254	0.968[a, b]	0.176	0.931	0.254
Class	1.389	0.984	1.095[a]	1.042	1.101[a]	1.050	1.299	1.022
Purpose	2.265	0.728	2.381	0.731	2.296	0.797	2.251	0.811
Required	0.897	0.304	0.937	0.244	0.947	0.224	0.913	0.282
Type	3.833	0.550	3.894	0.399	3.921	0.385	3.960[a]	0.196
PrevCourse	0.167	0.373	0.153	0.361	---	---	---	---
PrevInstr	0.030	0.171	0.021	0.144	---	---	---	---
Ratings	0.142	0.349	0.138	0.345	---	---	---	---
CourseValue	0.914	0.774	1.053	0.756	---	---	---	---
Transferred Hours	---	---	---	---	1.946	2.298	2.336	2.405
OSU Semesters	---	---	---	---	2.651	4.495	2.801	2.042
Male Evaluating Male	0.402	0.491	0.259[a]	0.439	0.259[a]	0.439	---	---
Male Evaluating Female	0.137	0.344	0.090	0.287	0.090	0.287	---	---
Female Evaluating Male	0.286	0.453	0.466[a]	0.500	0.466[a]	0.500	---	---

Table III-17. Cont.

	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Female Evaluating Female	0.175	0.381	0.185	0.389	0.185	0.389	---	---
Instructor Characteristics								
Prep	3.241	0.769	3.212	0.749	3.561[a, b]	0.595	3.517[a]	0.639
TeachEffort	3.302	0.758	3.339	0.738	3.646[a, b]	0.552	3.574[a]	0.607
Present	3.272	0.821	3.228	0.741	3.312	0.767	3.270	0.844
Knowledge	3.121	0.818	3.053	0.797	3.751[a, b]	0.491	3.730[a]	0.558
Explain	3.496	0.715	3.497	0.727	3.471	0.696	3.336[a]	0.846
Attitude	3.155	0.839	3.212	0.749	3.635[a, b]	0.635	3.522[a]	0.740
Full Professor	0.684	0.466	0.730	0.445	0.730	0.445	0.710	0.455
Associate Professor	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Assistant Professor	0.244	0.430	0.212	0.410	0.212	0.410	0.234	0.424
Instructor	0.073	0.260	0.058	0.235	0.058	0.235	0.056	0.231
InstGender	0.312	0.464	0.275	0.448	0.275	0.448	0.290	0.455
Course Characteristics								
Learned a lot	---	---	---	---	4.259	0.780	4.160	0.826
Workload	3.498	0.763	3.413	0.627	4.238[a, b]	0.670	4.165[a]	0.812
Assignments	3.519	0.715	3.402	0.616	4.238[a, b]	0.716	4.134[a]	0.794
Tests	3.416	0.692	3.217[a]	0.526	4.127[a, b]	0.860	4.035[a]	0.913
Involve	3.623	0.764	3.481[a]	0.665	4.206[a, b]	0.672	4.082[a]	0.806
Worthwhile	3.762	0.769	3.593[a]	0.690	4.138[a, b]	0.873	4.052[a]	0.963
Class size	160.043	72.261	172.772	71.547	166.354[b]	70.190	156.299	66.843
Upper Division Course	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lower Division Course	1.000	0.000	1.000	0.000	1.000	0.000	1.000	0.000

Table III-17. Cont.

Variable	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Time	0.419	0.494	0.349	0.478	0.349	0.478	0.372	0.484
New Course	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Day	2.791	0.956	2.635	0.899	---	---	---	---
Beginning	1.000	0.000	1.000	0.000	0.566[a, b]	0.497	0.463[a, c]	0.500
Middle	0.000	0.000	0.000	0.000	---	---	---	---
End	0.000	0.000	0.000	0.000	0.434[a, b]	0.497	0.537[a, c]	0.500
Student Views								
TeachStyle	3.131	0.870	3.039	0.663	---	---	---	---
OneSection	1.256	0.868	1.124	0.887	---	---	---	---
FriendRec	2.959	0.997	2.920	0.921	---	---	---	---
WebRec	2.615	0.838	2.645	0.731	---	---	---	---
ProfRec	2.740	0.965	2.808	0.847	---	---	---	---
SubInterest	3.349	0.920	3.305	0.843	---	---	---	---
Goodgrade	2.734	0.914	2.686	0.799	---	---	---	---
Syllabus	3.532	0.838	3.473	0.734	4.328[a, b]	0.675	4.082[a, c]	0.790
ActiveInvolve	3.570	0.749	3.471	0.711	3.957[a, b]	0.813	3.935[a]	0.882
Entertain	3.786	0.812	3.723	0.773	4.270[a, b]	0.836	4.135[a]	0.889
Ask	3.270	1.031	3.085	0.938	3.151	1.180	3.139	1.089
Answer	3.199	1.048	2.942[a]	0.924	3.246[b]	1.254	3.266	1.065
Fair	3.748	0.757	3.651	0.761	4.302[a, b]	0.778	4.278[a]	0.782
CalledOn	3.355	1.049	3.090[a]	0.955	3.333[b]	1.229	3.348	1.070
Focus	3.675	0.825	3.540	0.761	3.857[a, b]	1.050	3.848[a]	0.934
Visualaids	3.587	0.856	3.513	0.748	4.085[a, b]	0.861	3.974[a]	0.948
Stories	3.557	0.853	3.495	0.720	3.947[a, b]	0.914	3.870[a]	0.901
Classroom	2.632	1.012	2.397[a]	0.829	1.984[a, b]	0.986	2.374[a, c]	1.101

Table III-17. Cont.

Variable	Unmatched initial Evaluations		Matched initial Evaluations		Matched final Evaluations		Unmatched final Evaluations	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distract	2.905	0.978	2.683[a]	0.902	2.449[a, b]	1.145	2.732[c]	1.147
ExpAttendance	0.254	0.581	0.196	0.504	0.529[a, b]	0.809	0.473[a]	0.687
ExpGrade	3.575	0.734	3.720[a]	0.602	3.312[a, b]	0.728	3.074[a, c]	0.796

[a] Mean is significantly different from corresponding mean in unmatched initial evaluation column at the 5% level
[b] Mean is significantly different from corresponding mean in matched initial evaluation column at the 5% level
[c] Mean is significantly different from corresponding mean in final matched evaluation column at the 5% level

Table III-18. Comparison of Means from Control Group Across Course Divisions

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Dependent Variables						
InstrOverall	3.687	0.556	3.909[a]	0.302	3.643	0.586
CourseOverall	4.328	0.533	4.545	0.522	4.286	0.530
Course Improved	4.136[a]	0.762	4.364[a]	0.505	4.091	0.800
Instructor Improved	4.194	0.783	4.364	0.505	4.161	0.826
Recommend Instructor to Friend	4.433	0.679	4.727[a]	0.467	4.375	0.702
Recommend Course to Friend	4.328[a]	0.613	4.636[a]	0.505	4.268	0.618
Student Characteristics						
Gender	0.731	0.447	0.636	0.505	0.750	0.437
College	0.910	0.288	0.909	0.302	0.911	0.288
Class	0.806[a]	0.957	2.091[a]	0.539	0.554[a]	0.807
Purpose	2.522	0.785	2.364	0.924	2.554[a]	0.761
Required	0.939[a]	0.240	0.900[a]	0.316	0.946	0.227
Type	3.866	0.575	4.000[a]	0.000	3.839	0.626
PrevCourse	---	---	---	---	---	---
PrevInstr	---	---	---	---	---	---
Ratings	0.149	0.359	0.091	0.302	0.161	0.371
CourseValue	0.597	0.780	0.364	0.674	0.643	0.796
Transferred Hours	1.418[a]	1.932	3.091	2.773	1.089[a]	1.552
OSU Semesters	2.075[a]	1.627	3.800[a]	1.317	1.804[a]	1.482
Male Evaluating Male	0.269[a]	0.447	0.364[a]	0.505	0.250[a]	0.437
Male Evaluating Female	---	---	---	---	0.000[a]	0.000
Female Evaluating Male	0.701[a]	0.461	0.636[a]	0.505	0.714[a]	0.456
Female Evaluating Female	0.030[a]	0.171	---	---	0.036[a]	0.187

Table III-18. Cont.

Variable	All Courses		Upper Division Courses		Lower Division Courses	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Instructor Characteristics						
Prep	3.687[a]	0.528	3.818[a]	0.405	3.661	0.549
TeachEffort	3.716	0.486	3.818	0.405	3.696	0.502
Present	3.507[a]	0.637	3.818[a]	0.405	3.446	0.658
Knowledge	3.761	0.495	3.818	0.405	3.750	0.513
Explain	3.582[a]	0.581	3.727[a]	0.467	3.554	0.601
Attitude	3.537	0.876	3.818	0.405	3.482	0.934
Full Professor	0.970[a]	0.171	1.000[a]	0.000	0.964[a]	0.187
Associate Professor	---	---	---	---	0.000[a]	0.000
Assistant Professor	0.030[a]	0.171	---	---	0.036[a]	0.187
Instructor	---	---	---	---	0.000[a]	0.000
InstGender	0.030[a]	0.171	0.000	0.000	0.036[a]	0.187
Course Characteristics						
Learned a lot	4.284	0.755	4.364	0.924	4.268	0.726
Workload	4.254	0.636	4.364	0.924	4.232	0.572
Assignments	4.364	0.545	4.364	0.674	4.364	0.522
Tests	4.152	0.685	3.900	1.101	4.196	0.585
Involve	4.030[a]	0.758	4.091	0.944	4.018	0.726
Worthwhile	4.224	0.755	4.182	0.982	4.232	0.713
Class size	189.104[a]	50.557	100.000[a]	0.000	206.607[a]	34.167
Upper Division Course	0.164[a]	0.373	1.000[a]	0.000	0.000	0.000
Lower Division Course	0.836[a]	0.373	0.000	0.000	1.000	0.000
Time	0.224[a]	0.420	0.000[a]	0.000	0.268	0.447
New Course	---	---	---	---	---	---

Table III-18. Cont.

Variable	All Courses		Upper Division Courses		Lower Division Courses	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Day	---	---	---	---	---	---
Beginning	0.746[a]	0.438	1.000[a]	0.000	0.696	0.464
Middle	---	---	---	---	---	---
End	0.254[a]	0.438	0.000[a]	0.000	0.304	0.464
Student Views						
TeachStyle	---	---	---	---	---	---
OneSection	---	---	---	---	---	---
FriendRec	---	---	---	---	---	---
WebRec	---	---	---	---	---	---
ProfRec	---	---	---	---	---	---
SubInterest	---	---	---	---	---	---
Goodgrade	---	---	---	---	---	---
Syllabus	4.328	0.660	4.545	0.522	4.286	0.680
ActiveInvolve	3.879	0.953	4.273	0.647	3.800	0.989
Entertain	4.418	0.801	4.727	0.467	4.357	0.841
Ask	3.169	1.140	3.100	1.287	3.182	1.124
Answer	3.415	1.130	3.100	1.287	3.473	1.103
Fair	4.284	0.755	4.727	0.467	4.196	0.773
CalledOn	3.446	1.186	3.100	1.287	3.509	1.169
Focus	3.896	0.890	4.182	0.874	3.839	0.890
Visualaids	4.031	1.045	4.500	0.527	3.945	1.096
Stories	4.138	0.827	4.545	0.522	4.056	0.856
Classroom	1.984	1.046	2.700	1.337	1.852	0.940
Distract	2.460	1.119	2.300	1.337	2.491	1.085
ExpAttendance	0.438	0.710	0.700	0.949	0.389	0.656
ExpGrade	3.284	0.735	3.636	0.674	3.214	0.731

[a] Mean is significantly different from corresponding mean in final matched evaluation column at the 5% level

Table III-19. Cross tabulation of preparation across the semester in all courses

	End of Semester					
	Very Low	Low	Average	High	Very High	Total
Very Low	0	0	0	0	2	2
Low	0	0	3	0	0	3
Average	0	1	8	25	13	47
High	0	1	14	68	93	176
Very High	1	1	4	34	155	195
Total	1	3	29	127	263	423

Table III-20. Cross tabulation of effort devoted to teaching across the semester in all courses

	End of Semester					
	Very Low	Low	Average	High	Very High	Total
Very Low	0	0	0	0	2	2
Low	0	0	0	1	0	1
Average	0	2	5	16	12	35
High	0	0	15	64	84	163
Very High	1	0	4	29	188	222
Total	1	2	24	110	286	423

Table III-21. Cross tabulation of presentation across the semester in all courses

	End of Semester					
	Very Low	Low	Average	High	Very High	Total
Very Low	0	0	1	1	0	2
Low	1	1	0	0	0	2
Average	0	0	10	11	12	33
High	0	7	32	75	64	178
Very High	3	2	21	42	140	208
Total	4	10	64	129	216	423

Table III-22. Cross tabulation of knowledge across the semester in all courses

	End of Semester					
	Very Low	Low	Average	High	Very High	Total
Very Low	0	0	0	0	2	2
Low	0	0	1	1	1	3
Average	0	1	6	26	49	82
High	0	2	7	50	113	172
Very High	2	1	1	14	146	164
Total	2	4	15	91	311	423

Table III-23. Cross tabulation of ability to explain material across the semester in all courses

	End of Semester					
	Very Low	Low	Average	High	Very High	Total
Very Low	0	0	0	1	1	2
Low	0	0	0	0	0	0
Average	1	3	1	12	8	25
High	3	0	22	53	54	132
Very High	2	2	17	59	183	263
Total	6	5	40	125	246	422

Table III-24. Cross tabulation of attitude across the semester in all courses

	End of Semester					
	Very Low	Low	Average	High	Very High	Total
Very Low	0	0	0	1	2	3
Low	0	0	1	1	0	2
Average	0	3	3	16	34	56
High	0	1	12	51	102	166
Very High	1	0	6	21	167	195
Total	1	4	22	90	305	422

Table III-25. Cross tabulation of overall instructor appraisal across the semester in all courses

	End of Semester					
	Very Low	Low	Average	High	Very High	Total
Very Low	0	0	0	0	2	2
Low	0	0	0	3	0	3
Average	0	2	3	7	20	32
High	0	2	10	55	62	129
Very High	1	2	10	52	192	257
Total	1	6	23	117	276	423

Table III-26. Cross tabulation of workload across the semester in all courses

	End of Semester					
	Undecided	Definitely No	No	Yes	Definitely Yes	Total
Not applicable/ Undecided	10	2	6	107	84	209
Definitely No	0	0	0	0	0	0
No	1	0	0	2	0	3
Yes	9	1	2	96	40	148
Definitely Yes	4	0	2	19	37	62
Total	24	3	10	224	161	422

Table III-27. Cross tabulation of assignments across the semester in all courses

	End of Semester					
	Undecided	Definitely No	No	Yes	Definitely Yes	Total
Not applicable/ Undecided	14	3	8	107	79	211
Definitely No	0	0	0	0	0	0
No	1	0	0	1	1	3
Yes	11	1	3	80	49	144
Definitely Yes	2	0	0	17	45	64
Total	28	4	11	205	174	422

Table III-28. Cross tabulation of tests across the semester in all courses

	End of Semester					
	Undecided	Definitely No	No	Yes	Definitely Yes	Total
Not applicable/ Undecided	18	5	17	143	103	286
Definitely No	0	0	0	0	0	0
No	2	0	0	2	0	4
Yes	9	3	2	42	34	90
Definitely Yes	2	0	1	7	28	38
Total	31	8	20	194	165	418

Table III-29. Cross tabulation of involved across the semester in all courses

	End of Semester					
	Undecided	Definitely No	No	Yes	Definitely Yes	Total
Not applicable/ Undecided	10	0	7	97	56	170
Definitely No	0	0	0	0	0	0
No	0	0	1	0	1	2
Yes	10	0	4	94	67	175
Definitely Yes	1	0	0	21	53	75
Total	21	0	12	212	177	422

Table III-30. Cross tabulation of worthwhile across the semester in all courses

	End of Semester					
	Undecided	Definitely No	No	Yes	Definitely Yes	Total
Not applicable/ Undecided	19	5	16	76	44	160
Definitely No	0	0	0	0	0	0
No	1	0	3	0	1	5
Yes	13	1	3	70	77	164
Definitely Yes	2	0	2	25	62	91
Total	35	6	24	171	184	420

Table III-31. Cross tabulation of overall course appraisal across the semester in all courses

	End of Semester					
	Undecided	Definitely No	No	Yes	Definitely Yes	Total
Not applicable/ Undecided	17	4	9	81	73	184
Definitely No	0	0	0	0	0	0
No	0	0	1	0	0	1
Yes	10	0	3	75	67	155
Definitely Yes	1	0	1	16	61	79
Total	28	4	14	172	201	419

Table III-32. Multinomial Logit Estimates of a Positive Change in Instructor Score Relative to a No Change in Instructor Score

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-2.781***	0.342	-3.931***	0.679	-2.553***	0.511
Prep	-0.077	0.326	0.401	0.579	-0.399	0.414
TeachEffort	0.777**	0.345	0.962*	0.536	0.488	0.501
Present	1.459***	0.296	0.825*	0.495	1.649***	0.425
Knowledge	0.682**	0.270	0.807*	0.468	0.906**	0.396
Explain	0.433*	0.250	0.711*	0.390	0.271	0.332
Attitude	0.354	0.242	1.208**	0.504	0.102	0.300
Workload	0.230	0.263	0.077	0.425	0.295	0.373
Assignments	0.088	0.308	-0.515	0.449	0.477	0.484
Tests	-0.224	0.259	0.268	0.473	-0.506	0.381
Involve	0.320	0.236	0.313	0.394	0.444	0.351
Worthwhile	0.052	0.241	-0.151	0.433	0.114	0.333
N	415		227		188	
-2LL	465.079		190.630		224.044	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.426, 0.538 and 0.404 for all, upper division, and lower division courses, respectively.
A log likelihood ratio test favored separate estimated models for the upper and lower division courses over the pooled (all courses) model.

Table III-33. Multinomial Logit Estimates of a Negative Change in Instructor Score Relative to No Change in Instructor Score

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-2.108***	0.284	-2.899***	0.482	-2.011***	0.503
Prep	-0.209	0.295	-0.451	0.508	-0.262	0.418
TeachEffort	-0.117	0.322	0.452	0.484	-0.726	0.587
Present	-1.362***	0.265	-2.250***	0.467	-1.062**	0.439
Knowledge	0.148	0.245	-0.100	0.396	0.454	0.381
Explain	-0.864***	0.242	-1.444***	0.390	-0.483	0.383
Attitude	0.014	0.225	-0.662*	0.363	0.546*	0.323
Workload	-0.234	0.233	-0.854**	0.413	0.266	0.357
Assignments	0.045	0.266	0.264	0.434	0.146	0.436
Tests	-0.168	0.195	0.394	0.282	-0.897**	0.368
Involve	-0.049	0.253	0.072	0.405	-0.054	0.418
Worthwhile	-0.436*	0.243	-1.157***	0.431	-0.094	0.352
N	415		227		188	
-2LL	465.079		190.630		224.044	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.426, 0.538 and 0.404 for all, upper division, and lower division courses, respectively.
A log likelihood ratio test favored separate estimated models for the upper and lower division courses over the pooled (all courses) model.

Table III-34. Multinomial Logit Estimates of a Positive Change in Overall Course Score Relative to No Change in Overall Course Score

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.845***	0.295	-2.321***	0.419	-2.283***	0.612
Prep	0.379	0.292	0.959**	0.465	0.458	0.479
TeachEffort	0.176	0.330	-0.003	0.478	-0.077	0.556
Present	-0.043	0.238	-0.220	0.324	0.166	0.493
Knowledge	0.429*	0.240	0.170	0.337	1.010*	0.532
Explain	0.023	0.223	-0.495	0.321	0.784*	0.400
Attitude	-0.141	0.218	0.122	0.322	0.042	0.391
Workload	0.456**	0.222	-0.176	0.316	1.597***	0.426
Assignments	0.746***	0.251	0.728**	0.339	1.379**	0.546
Tests	0.138	0.196	0.728***	0.274	-0.975**	0.440
Involve	0.611***	0.223	0.656**	0.304	0.580	0.396
Worthwhile	1.675***	0.255	2.021***	0.368	1.491***	0.432
N	415		227		188	
-2LL	411.312		234.079		138.143	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.490, 0.498 and 0.574 for all, upper division, and lower division courses, respectively.
A log likelihood ratio test favored separate estimated models for the upper and lower division courses over the pooled (all courses) model.

Table III-35. Multinomial Logit Estimates of a Negative Change in Overall Course Score Relative to No Change in Overall Course Score

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-2.196***	0.366	-2.194***	0.436	-2.146***	0.734
Prep	-0.062	0.354	-0.243	0.498	0.029	0.672
TeachEffort	0.400	0.393	0.764	0.523	-0.244	1.001
Present	-0.479	0.303	-0.188	0.371	-0.958	0.706
Knowledge	-0.234	0.304	-0.155	0.393	-0.516	0.724
Explain	-0.045	0.301	-0.124	0.358	0.373	0.778
Attitude	-0.061	0.324	-0.255	0.419	0.312	0.716
Workload	-0.035	0.269	-0.283	0.378	0.381	0.506
Assignments	0.270	0.334	0.355	0.424	0.298	0.652
Tests	-0.813***	0.252	-0.788**	0.315	-1.147**	0.545
Involve	-0.475	0.311	-0.228	0.442	-0.595	0.577
Worthwhile	-1.796***	0.372	-2.071***	0.549	-1.985***	0.702
N	415		227		188	
-2LL	411.312		234.079		138.143	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.490, 0.498 and 0.574 for all, upper division, and lower division courses, respectively.
A log likelihood ratio test favored separate estimated models for the upper and lower division courses over the pooled (all courses) model.

Table III-36. Marginal Effects of a Change in Instructor Score for All Course Types

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Prep	0.020	-0.015	-0.005	0.021	-0.032	0.011	0.075	-0.010	-0.065
TeachEffort	-0.051	-0.015	0.066	-0.053	0.030	0.024	-0.044	-0.051	0.095
Present	-0.017	-0.116	0.133	0.133	-0.158	0.025	-0.212	-0.088	0.300
Knowledge	-0.062	0.006	0.056	-0.012	-0.009	0.021	-0.165	0.014	0.150
Explain	0.027	-0.070	0.043	0.081	-0.102	0.021	-0.021	-0.033	0.054
Attitude	-0.028	-0.002	0.030	0.016	-0.048	0.032	-0.041	0.032	0.010
Workload	-0.001	-0.020	0.021	0.056	-0.060	0.004	-0.059	0.012	0.047
Assignments	-0.010	0.003	0.007	-0.006	0.019	-0.014	-0.082	0.002	0.080
Tests	0.029	-0.011	-0.017	-0.033	0.027	0.006	0.122	-0.047	-0.075
Involve	-0.021	-0.006	0.027	-0.012	0.004	0.008	-0.068	-0.010	0.078
Worthwhile	0.026	-0.034	0.008	0.082	-0.080	-0.002	-0.014	-0.007	0.021

Table III-37. Marginal Effects of Multinomial Logit Estimates for Change in Course Appraisal

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Prep	-0.091	-0.003	0.094	-0.215	-0.013	0.228	-0.073	-0.001	0.074
TeachEffort	-0.044	0.003	0.041	-0.009	0.016	-0.007	0.012	0.000	-0.012
Present	0.012	-0.005	-0.008	0.053	-0.002	-0.050	-0.026	-0.002	0.028
Knowledge	-0.102	-0.005	0.107	-0.037	-0.005	0.041	-0.160	-0.003	0.163
Explain	-0.005	-0.001	0.006	0.114	0.001	-0.116	-0.125	-0.001	0.125
Attitude	0.034	0.000	-0.034	-0.024	-0.006	0.031	-0.007	0.001	0.006
Workload	-0.109	-0.003	0.112	0.044	-0.005	-0.039	-0.254	-0.002	0.256
Assignments	-0.180	-0.002	0.182	-0.170	0.002	0.168	-0.219	-0.002	0.221
Tests	-0.029	-0.010	0.039	-0.155	-0.023	0.178	0.155	-0.001	-0.155
Involve	-0.144	-0.009	0.153	-0.146	-0.010	0.156	-0.092	-0.002	0.094
Worthwhile	-0.394	-0.030	0.424	-0.432	-0.061	0.493	-0.236	-0.007	0.243

Table III-38. Multinomial Logit Estimates of a Positive Change in Preparation Relative to No Change in Preparation

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-0.274	0.341	0.293	0.698	-0.290	0.427
Syllabus	0.052	0.165	0.082	0.220	0.048	0.274
ActInvolve	0.092	0.168	0.199	0.267	0.021	0.237
Entertain	0.173	0.175	0.041	0.269	0.366	0.262
Ask	0.112	0.138	0.208	0.197	0.032	0.211
Answer	-0.057	0.165	0.062	0.234	-0.178	0.255
Fair	0.074	0.173	0.411	0.279	-0.233	0.250
CalledOn	-0.072	0.145	-0.220	0.203	0.047	0.236
Focus	-0.080	0.123	-0.160	0.200	-0.023	0.171
Visual	-0.154	0.148	-0.324	0.217	-0.004	0.226
Stories	0.183	0.159	0.303	0.241	0.104	0.224
Classroom	0.133	0.132	0.161	0.201	0.116	0.192
Distractions	-0.154	0.114	-0.073	0.164	-0.204	0.181
Attendance	-0.078	0.163	0.045	0.261	-0.221	0.231
Grade	0.126	0.172	-0.143	0.315	0.193	0.214
Transferred Hours	-0.034	0.053	-0.140	0.088	0.009	0.085
OSU Semesters	-0.057	0.049	-0.146	0.095	-0.043	0.057
N	341		179		162	
-2LL	608.176		318.046		262.484	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.253, 0.301, and 0.254 for all, upper division, and lower division courses, respectively.

Table III-39. Multinomial Logit Estimates of a Negative Change in Preparation Relative to No Change in Preparation

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-0.719	0.467	0.072	0.813	-0.774	0.787
Syllabus	-0.556	0.219	-0.417	0.276	-0.792*	0.476
ActInvolve	-0.314	0.214	-0.296	0.279	-0.396	0.432
Entertain	-0.084*	0.231	0.103	0.316	-0.183	0.457
Ask	0.064	0.183	0.076	0.224	0.415	0.428
Answer	0.091	0.213	0.105	0.265	0.167	0.464
Fair	0.113	0.237	-0.112	0.351	-0.013	0.409
CalledOn	-0.198	0.199	-0.052	0.229	-0.901*	0.477
Focus	-0.102	0.177	-0.059	0.244	-0.190	0.303
Visual	-0.148	0.206	-0.098	0.279	0.069	0.400
Stories	-0.115	0.210	-0.190	0.274	0.094	0.405
Classroom	0.142	0.188	0.173	0.240	0.060	0.406
Distractions	-0.031*	0.152	-0.246	0.197	0.326	0.341
Attendance	-0.165	0.240	0.201	0.325	-0.315	0.455
Grade	-0.208	0.252	-0.126	0.352	-0.750	0.483
Transferred Hours	-0.029	0.071	-0.059	0.100	-0.200	0.176
OSU Semesters	-0.097	0.075	-0.218*	0.117	-0.197	0.179
N	341		179		162	
-2LL	608.176		318.046		262.484	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.253, 0.301, and 0.254 for all, upper division, and lower division courses, respectively.

Table III-40. Marginal Effects of Multinomial Logit Estimates for Change in Preparation

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	0.023	0.030	-0.053	0.020	0.032	-0.052	0.082	-0.056	-0.025
ActInvolve	0.001	0.030	-0.032	-0.009	0.051	-0.043	0.008	0.023	-0.031
Entertain	-0.027	0.041	-0.013	-0.015	0.004	0.011	0.005	0.011	-0.016
Ask	-0.025	0.022	0.002	-0.040	0.039	0.001	-0.076	0.089	-0.013
Answer	0.005	-0.015	0.010	-0.018	0.008	0.010	-0.017	0.001	0.015
Fair	-0.020	0.012	0.008	-0.058	0.087	-0.029	0.035	-0.044	0.009
CalledOn	0.025	-0.009	-0.016	0.040	-0.042	0.002	0.051	-0.054	0.003
Focus	0.021	-0.014	-0.007	0.031	-0.030	-0.001	0.011	0.025	-0.035
Visual	0.037	-0.029	-0.008	0.060	-0.061	0.001	0.010	-0.003	-0.007
Stories	-0.027	0.044	-0.017	-0.034	0.068	-0.034	-0.001	-0.002	0.003
Classroom	-0.033	0.024	0.009	-0.040	0.026	0.014	-0.025	0.023	0.002
Distractions	0.030	-0.033	0.002	0.032	-0.005	-0.026	-0.027	0.026	0.001
Attendance	0.024	-0.012	-0.013	-0.023	0.001	0.022	0.037	-0.053	0.016
Grade	-0.011	0.034	-0.023	0.033	-0.024	-0.010	0.056	-0.047	-0.009
Transferred Hours	0.008	-0.006	-0.002	0.027	-0.026	-0.002	-0.025	0.057	-0.032
OSU Semesters	0.016	-0.009	-0.007	0.041	-0.021	-0.020	0.003	0.005	-0.008

Table III-41. Multinomial Logit Estimates of a Positive Change in Explanation Relative to No Change in Explanation

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.333***	0.386	-0.742	0.895	-1.174**	0.594
Syllabus	0.105	0.200	0.409	0.293	-0.272	0.366
ActInvolve	0.036	0.207	-0.690**	0.344	0.509	0.329
Entertain	-0.221	0.216	0.168	0.349	-0.578*	0.347
Ask	-0.072	0.168	-0.130	0.247	0.036	0.276
Answer	-0.046	0.200	-0.160	0.312	-0.075	0.325
Fair	0.202	0.220	0.915**	0.377	-0.470	0.328
CalledOn	0.171	0.177	0.160	0.277	0.239	0.302
Focus	0.066	0.155	-0.129	0.274	0.422	0.260
Visual	-0.209	0.186	-0.433	0.287	-0.191	0.306
Stories	0.607***	0.206	0.851***	0.323	0.694**	0.319
Classroom	0.115	0.159	0.381	0.276	-0.109	0.241
Distractions	-0.125	0.137	-0.039	0.221	-0.095	0.222
Attendance	-0.179	0.203	-0.405	0.367	-0.125	0.307
Grade	0.143	0.206	0.749*	0.453	-0.177	0.270
Transferred Hours	-0.027	0.065	-0.276**	0.124	0.140	0.102
OSU Semesters	0.025	0.043	0.002	0.121	-0.007	0.069
N	341		179		162	
-2LL	606.613		291.633		261.004	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.271, 0.354, and 0.311 for all, upper division, and lower division courses, respectively.

Table III-42. Multinomial Logit Estimates of a Negative Change in Explanation Relative to No Change in Explanation

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-0.497	0.311	-0.384	0.711	0.531	0.504
Syllabus	-0.136	0.171	0.212	0.227	-0.970***	0.373
ActInvolve	-0.057	0.178	-0.345	0.262	0.208	0.315
Entertain	-0.477**	0.189	-0.345	0.272	-0.737**	0.335
Ask	-0.050	0.147	-0.071	0.187	0.169	0.286
Answer	-0.079	0.175	-0.185	0.232	-0.120	0.325
Fair	-0.091	0.189	0.352	0.287	-0.739**	0.326
CalledOn	0.246	0.157	0.293	0.197	0.266	0.303
Focus	-0.319**	0.139	-0.501**	0.214	-0.072	0.217
Visual	-0.467***	0.170	-0.519**	0.243	-0.528*	0.305
Stories	0.154	0.173	0.271	0.241	0.191	0.289
Classroom	-0.160	0.151	0.031	0.207	-0.642**	0.290
Distractions	-0.011	0.123	0.014	0.166	0.031	0.236
Attendance	-0.171	0.191	-0.289	0.268	0.026	0.339
Grade	-0.373*	0.203	-0.447	0.305	-0.267	0.285
Transferred Hours	-0.040	0.056	-0.083	0.087	-0.145	0.121
OSU Semesters	0.023	0.038	0.000	0.098	0.012	0.048
N	341		179		162	
-2LL	606.613		291.633		261.004	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.271, 0.354, and 0.311 for all, upper division, and lower division courses, respectively.

Table III-43. Marginal Effects of Multinomial Logit Estimates for Change in Explanation

Variable	All Courses			Upper Division Courses			Lower Division Courses		
	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	0.008	0.021	-0.030	-0.072	0.051	0.021	0.145	-0.006	-0.138
ActInvolve	0.004	0.008	-0.012	0.120	-0.086	-0.034	-0.088	0.076	0.012
Entertain	0.090	-0.011	-0.079	0.031	0.040	-0.071	0.157	-0.067	-0.090
Ask	0.015	-0.008	-0.006	0.023	-0.016	-0.007	-0.024	-0.001	0.025
Answer	0.016	-0.003	-0.013	0.043	-0.015	-0.027	0.023	-0.008	-0.015
Fair	-0.008	0.034	-0.026	-0.144	0.119	0.025	0.143	-0.049	-0.095
CalledOn	-0.052	0.014	0.038	-0.058	0.011	0.047	-0.060	0.029	0.031
Focus	0.038	0.024	-0.062	0.084	0.003	-0.087	-0.045	0.073	-0.028
Visual	0.087	-0.010	-0.077	0.118	-0.041	-0.077	0.084	-0.011	-0.073
Stories	-0.084	0.082	0.002	-0.126	0.113	0.013	-0.109	0.107	0.002
Classroom	0.011	0.024	-0.035	-0.044	0.055	-0.011	0.087	0.007	-0.094
Distractions	0.014	-0.018	0.004	0.002	-0.006	0.004	0.008	-0.017	0.008
Attendance	0.043	-0.019	-0.024	0.083	-0.047	-0.036	0.013	-0.022	0.009
Grade	0.038	0.037	-0.075	-0.014	0.130	-0.116	0.053	-0.019	-0.034
Transferred Hours	0.008	-0.002	-0.006	0.040	-0.037	-0.003	-0.001	0.029	-0.028
OSU Semesters	-0.006	0.003	0.003	0.000	0.000	0.000	0.000	-0.002	0.002

Table III-44. Multinomial Logit Estimates of a Positive Change in Teaching Effort Relative to No Change in Teaching Effort

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.156***	0.371	0.634	0.727	-1.867***	0.563
Syllabus	0.206	0.178	0.132	0.255	0.335	0.301
ActInvolve	0.036	0.181	-0.093	0.306	-0.035	0.255
Entertain	0.341*	0.190	0.468	0.297	0.314	0.277
Ask	-0.102	0.147	-0.177	0.207	0.031	0.238
Answer	-0.093	0.179	-0.017	0.251	-0.243	0.284
Fair	0.274	0.191	0.727**	0.333	0.069	0.277
CalledOn	-0.066	0.159	-0.001	0.225	-0.230	0.259
Focus	-0.071	0.131	0.060	0.226	-0.015	0.185
Visual	0.050	0.159	-0.309	0.237	0.429*	0.260
Stories	-0.088	0.168	-0.098	0.268	-0.053	0.238
Classroom	0.166	0.143	0.246	0.229	0.161	0.214
Distractions	-0.212*	0.123	-0.044	0.178	-0.368*	0.197
Attendance	-0.150	0.179	-0.228	0.302	-0.058	0.251
Grade	0.353*	0.187	0.520	0.362	0.267	0.240
Transferred Hours	-0.038	0.059	-0.241**	0.098	0.029	0.097
OSU Semesters	0.031	0.053	-0.210**	0.105	0.163	0.101
N	341		179		162	
-2LL	539.883		277.127		231.134	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.300, 0.353, and 0.311 for all, upper division, and lower division courses, respectively.

Table III-45. Multinomial Logit Estimates of a Negative Change in Teaching Effort Relative to No Change in Teaching Effort

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-2.502***	0.504	-2.536***	0.983	-3.017***	0.788
Syllabus	-0.235	0.217	-0.286	0.284	-0.192	0.462
ActInvolve	0.044	0.225	0.080	0.279	0.095	0.456
Entertain	-0.339	0.250	-0.282	0.354	-0.428	0.500
Ask	0.070	0.190	0.100	0.239	-0.077	0.436
Answer	-0.013	0.225	0.039	0.285	0.124	0.489
Fair	-0.165	0.254	-0.511	0.347	0.272	0.440
CalledOn	0.102	0.201	0.183	0.243	-0.114	0.453
Focus	-0.057	0.186	-0.212	0.262	0.078	0.315
Visual	-0.478**	0.225	-0.215	0.291	-0.987**	0.453
Stories	-0.282	0.225	-0.312	0.286	-0.333	0.422
Classroom	0.299	0.197	0.489*	0.257	0.237	0.379
Distractions	-0.235	0.164	-0.418**	0.210	-0.144	0.344
Attendance	0.055	0.251	0.103	0.332	0.115	0.486
Grade	-0.251	0.263	-0.243	0.361	-0.224	0.453
Transferred Hours	0.147**	0.072	0.136	0.109	0.194	0.147
OSU Semesters	0.114*	0.066	0.103	0.127	0.203*	0.108
N	341		179		162	
-2LL	539.883		277.127		231.134	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.300, 0.353, and 0.311 for all, upper division, and lower division courses, respectively.

Table III-46. Marginal Effects of Multinomial Logit Estimates for Change in Teaching Effort

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	-0.023	0.043	-0.020	0.001	0.028	-0.029	-0.058	0.069	-0.011
ActInvolve	-0.008	0.006	0.002	0.008	-0.017	0.009	0.004	-0.008	0.004
Entertain	-0.040	0.070	-0.030	-0.047	0.083	-0.035	-0.048	0.067	-0.019
Ask	0.014	-0.020	0.007	0.018	-0.031	0.013	-0.004	0.007	-0.003
Answer	0.016	-0.017	0.001	0.000	-0.004	0.004	0.043	-0.050	0.007
Fair	-0.038	0.054	-0.017	-0.068	0.130	-0.062	-0.020	0.011	0.009
CalledOn	0.006	-0.014	0.008	-0.013	-0.004	0.017	0.047	-0.045	-0.002
Focus	0.015	-0.012	-0.003	0.006	0.014	-0.021	0.001	-0.004	0.003
Visual	0.016	0.018	-0.034	0.059	-0.046	-0.013	-0.056	0.096	-0.040
Stories	0.029	-0.011	-0.018	0.036	-0.010	-0.026	0.019	-0.007	-0.012
Classroom	-0.043	0.026	0.018	-0.069	0.030	0.039	-0.037	0.030	0.007
Distractions	0.048	-0.035	-0.012	0.035	0.002	-0.037	0.073	-0.072	-0.001
Attendance	0.022	-0.029	0.007	0.025	-0.040	0.014	0.008	-0.013	0.005
Grade	-0.047	0.071	-0.024	-0.057	0.090	-0.033	-0.045	0.056	-0.011
Transferred Hours	-0.001	-0.010	0.011	0.025	-0.042	0.017	-0.010	0.004	0.007
OSU Semesters	-0.011	0.004	0.007	0.023	-0.037	0.014	-0.036	0.030	0.006

Table III-47. Multinomial Logit Estimates of a Positive Change in Attitude Relative to No Change in Attitude

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-0.661**	0.314	-0.874***	0.664	-0.326	0.467
Syllabus	-0.028	0.160	0.144	0.218	-0.301	0.288
ActInvolve	-0.050	0.168	-0.328***	0.265	0.052	0.257
Entertain	0.346**	0.174	0.303	0.265	0.429	0.279
Ask	-0.299**	0.139	-0.260	0.189	-0.409*	0.229
Answer	0.365**	0.167	0.201	0.231	0.586**	0.276
Fair	0.360**	0.181	0.678	0.279	0.235	0.284
CalledOn	-0.086	0.147	0.108	0.201	-0.340	0.251
Focus	-0.183	0.124	0.032	0.197	-0.271	0.184
Visual	-0.071	0.146	-0.356	0.213	0.131	0.240
Stories	0.116	0.156	0.318	0.237	0.001	0.230
Classroom	0.143	0.132	0.228	0.198	0.175	0.206
Distractions	-0.257**	0.113	-0.028	0.160	-0.579***	0.196
Attendance	-0.193	0.166	0.089	0.255	-0.541**	0.257
Grade	0.037	0.170	0.093***	0.305	0.109	0.227
Transferred Hours	-0.001	0.052	-0.032	0.083	0.062	0.093
OSU Semesters	0.045	0.042	0.057*	0.092	0.048	0.082
N	341		179		162	
-2LL	574.596		273.136		257.814	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.282, 0.368, and 0.287 for all, upper division, and lower division courses, respectively.

Table III-48. Multinomial Logit Estimates of a Negative Change in Attitude Relative to No Change in Attitude

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.883***	0.469	-4.318	1.348	-1.123	0.777
Syllabus	-0.249	0.227	-0.239	0.332	-0.394	0.396
ActInvolve	-0.446*	0.238	-0.723*	0.376	-0.149	0.389
Entertain	-0.016	0.250	0.060**	0.438	-0.545	0.429
Ask	0.025	0.211	0.055	0.295	0.302	0.419
Answer	0.420*	0.242	0.329	0.352	0.362	0.437
Fair	-0.528**	0.261	-0.342**	0.439	-0.628	0.400
CalledOn	-0.064	0.216	0.195	0.326	-0.307	0.406
Focus	-0.094	0.194	-0.267	0.319	0.232	0.321
Visual	0.043	0.243	-0.189	0.373	0.093	0.406
Stories	-0.246	0.231	-0.477	0.384	0.109	0.388
Classroom	-0.224	0.213	-0.289	0.323	-0.005	0.347
Distractions	0.061	0.176	0.343	0.268	-0.297	0.318
Attendance	0.244	0.262	0.147	0.452	-0.108	0.427
Grade	-0.160	0.273	-0.781	0.462	0.225	0.341
Transferred Hours	0.035	0.078	0.081	0.138	0.117	0.144
OSU Semesters	0.034	0.057	0.346	0.169	-0.044	0.172
N	341		179		162	
-2LL	574.596		273.136		257.814	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.282, 0.368, and 0.287 for all, upper division, and lower division courses, respectively.

Table III-49. Marginal Effects of Multinomial Logit Estimates for Change in Attitude

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	0.015	0.000	-0.015	-0.024	0.037	-0.013	0.078	-0.062	-0.015
ActInvolve	0.027	0.000	-0.028	0.090	-0.063	-0.027	-0.007	0.018	-0.011
Entertain	-0.072	0.083	-0.011	-0.066	0.068	-0.002	-0.076	0.123	-0.047
Ask	0.062	-0.072	0.010	0.053	-0.060	0.007	0.079	-0.111	0.032
Answer	-0.093	0.075	0.017	-0.052	0.040	0.011	-0.139	0.134	0.005
Fair	-0.056	0.100	-0.044	-0.134	0.160	-0.026	-0.031	0.078	-0.047
CalledOn	0.021	-0.019	-0.002	-0.028	0.021	0.007	0.084	-0.075	-0.009
Focus	0.042	-0.041	-0.001	0.001	0.012	-0.012	0.052	-0.074	0.023
Visual	0.013	-0.018	0.005	0.081	-0.078	-0.003	-0.031	0.030	0.002
Stories	-0.015	0.035	-0.019	-0.054	0.080	-0.026	-0.004	-0.003	0.007
Classroom	-0.022	0.040	-0.019	-0.040	0.057	-0.017	-0.038	0.044	-0.006
Distractions	0.052	-0.063	0.011	-0.004	-0.012	0.016	0.135	-0.135	-0.001
Attendance	0.032	-0.053	0.021	-0.023	0.018	0.005	0.121	-0.131	0.010
Grade	-0.002	0.013	-0.011	0.002	0.034	-0.036	-0.031	0.020	0.011
Transferred Hours	-0.001	-0.001	0.002	0.005	-0.009	0.004	-0.017	0.012	0.005
OSU Semesters	-0.011	0.010	0.001	-0.022	0.007	0.014	-0.009	0.013	-0.004

Table III-50. Multinomial Logit Estimates of a Positive Change in Presentation Relative to No Change in Presentation

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.539***	0.450	-2.024**	0.950	-1.369**	0.571
Syllabus	0.409*	0.216	0.572*	0.344	0.077	0.327
ActInvolve	0.265	0.216	0.414	0.449	0.341	0.285
Entertain	0.146	0.221	-0.138	0.362	0.226	0.323
Ask	-0.103	0.173	0.204	0.297	-0.327	0.256
Answer	0.156	0.209	0.121	0.332	0.135	0.307
Fair	0.365*	0.216	0.915**	0.418	0.095	0.288
CalledOn	0.080	0.184	-0.345	0.301	0.337	0.280
Focus	0.009	0.157	-0.187	0.299	0.174	0.205
Visual	-0.153	0.184	-0.456	0.305	-0.183	0.261
Stories	0.164	0.198	0.035	0.370	0.323	0.270
Classroom	0.103	0.162	0.142	0.280	0.126	0.227
Distractions	-0.013	0.140	0.306	0.233	-0.188	0.209
Attendance	0.154	0.195	-0.065	0.360	0.320	0.265
Grade	-0.021	0.204	0.147	0.433	-0.008	0.246
Transferred Hours	-0.030	0.066	-0.083	0.126	-0.008	0.101
OSU Semesters	-0.067	0.064	-0.016	0.126	-0.012	0.088
N	341		179		162	
-2LL	572.084		282.049		260.394	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.331, 0.358, and 0.345 for all, upper division, and lower division courses, respectively.

Table III-51. Multinomial Logit Estimates of a Negative Change in Attitude Relative to No Change in Presentation

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.014***	0.340	-1.424*	0.731	-0.969*	0.532
Syllabus	-0.292*	0.177	-0.217	0.221	-0.500	0.364
ActInvolve	-0.097	0.186	-0.248	0.258	0.004	0.315
Entertain	-0.512***	0.196	-0.378	0.273	-0.757**	0.349
Ask	0.133	0.153	0.210	0.188	-0.038	0.331
Answer	0.223	0.179	-0.091	0.223	0.806**	0.368
Fair	-0.151	0.197	-0.115	0.282	-0.129	0.346
CalledOn	-0.001	0.163	0.077	0.197	-0.044	0.326
Focus	-0.408***	0.145	-0.535**	0.212	-0.266	0.232
Visual	-0.067	0.174	0.057	0.224	-0.372	0.327
Stories	-0.079	0.175	0.037	0.232	-0.221	0.305
Classroom	-0.217	0.156	-0.111	0.203	-0.466	0.293
Distractions	0.010	0.128	-0.063	0.168	0.168	0.250
Attendance	0.159	0.204	-0.138	0.262	0.555	0.361
Grade	-0.215	0.213	-0.359	0.311	-0.153	0.306
Transferred Hours	0.052	0.058	0.084	0.087	0.038	0.118
OSU Semesters	0.051	0.042	0.108	0.100	0.047	0.056
N	341		179		162	
-2LL	572.084		282.049		260.394	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.331, 0.358, and 0.345 for all, upper division, and lower division courses, respectively.

Table III-52. Marginal Effects of Multinomial Logit Estimates for Change in Presentation

Variable	All Courses			Upper Division Courses			Lower Division Courses		
	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	-0.003	0.068	-0.065	0.012	0.045	-0.056	0.026	0.035	-0.061
ActInvolve	-0.014	0.040	-0.026	0.025	0.034	-0.059	-0.057	0.070	-0.013
Entertain	0.054	0.039	-0.093	0.075	-0.002	-0.074	0.021	0.075	-0.096
Ask	-0.007	-0.019	0.026	-0.048	0.010	0.038	0.057	-0.065	0.008
Answer	-0.046	0.014	0.032	0.011	0.010	-0.021	-0.085	-0.003	0.088
Fair	-0.017	0.056	-0.039	-0.024	0.066	-0.043	-0.006	0.024	-0.019
CalledOn	-0.008	0.011	-0.003	0.003	-0.026	0.023	-0.053	0.071	-0.018
Focus	0.054	0.016	-0.070	0.106	-0.002	-0.105	-0.008	0.046	-0.037
Visual	0.025	-0.019	-0.006	0.012	-0.033	0.021	0.059	-0.023	-0.036
Stories	-0.006	0.026	-0.020	-0.008	0.002	0.007	-0.037	0.075	-0.038
Classroom	0.019	0.022	-0.041	0.013	0.012	-0.026	0.015	0.044	-0.059
Distractions	0.000	-0.002	0.002	-0.003	0.023	-0.019	0.018	-0.045	0.027
Attendance	-0.037	0.016	0.022	0.028	-0.002	-0.027	-0.096	0.044	0.052
Grade	0.031	0.005	-0.036	0.058	0.018	-0.076	0.013	0.004	-0.017
Transferred Hours	-0.004	-0.006	0.010	-0.011	-0.008	0.019	-0.002	-0.003	0.005
OSU Semesters	0.000	-0.011	0.011	-0.019	-0.003	0.022	-0.002	-0.004	0.006

Table III-53. Multinomial Logit Estimates of a Positive Change in Knowledge Relative to No Change in Knowledge

	All Courses		Upper Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-0.186	0.646	-0.186	0.646
Syllabus	0.479**	0.220	0.479**	0.220
ActInvolve	-0.233	0.243	-0.233	0.243
Entertain	0.146	0.258	0.146	0.258
Ask	-0.114	0.181	-0.114	0.181
Answer	0.455**	0.223	0.455**	0.223
Fair	0.437	0.266	0.437	0.266
CalledOn	-0.359*	0.199	-0.359*	0.199
Focus	-0.149	0.188	-0.149	0.188
Visual	-0.201	0.216	-0.201	0.216
Stories	0.142	0.225	0.142	0.225
Classroom	0.057	0.197	0.057	0.197
Distractions	-0.047	0.158	-0.047	0.158
Attendance	-0.019	0.258	-0.019	0.258
Grade	-0.445	0.315	-0.445	0.315
Transferred Hours	-0.167**	0.083	-0.167**	0.083
OSU Semesters	-0.003	0.088	-0.003	0.088
N	341		179	
-2LL	521.438		269.086	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.308, 0.380 and 0.166 for all, upper division, and lower division courses, respectively.

Table III-54. Multinomial Logit Estimates of a Negative Change in Knowledge Relative to No Change in Knowledge

	All Courses		Upper Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-3.585***	0.720	-2.304*	1.206
Syllabus	-0.706**	0.301	-0.652*	0.376
ActInvolve	0.098	0.304	0.181	0.364
Entertain	-0.945**	0.374	-0.834*	0.497
Ask	-0.071	0.281	-0.201	0.319
Answer	-0.567*	0.322	-0.107	0.396
Fair	0.817**	0.327	0.224	0.465
CalledOn	0.958***	0.313	0.774**	0.375
Focus	-0.413	0.262	-0.701*	0.364
Visual	-0.874***	0.296	-0.503	0.346
Stories	0.710**	0.332	0.850**	0.367
Classroom	0.240	0.268	0.279	0.341
Distractions	-0.446*	0.244	-0.624*	0.325
Attendance	0.138	0.318	0.446	0.425
Grade	-0.949***	0.363	-1.200**	0.494
Transferred Hours	0.011	0.108	-0.155	0.142
OSU Semesters	0.069	0.060	-0.081	0.168
N	341		179	
-2LL	521.438		269.086	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.270, 0.325 and 0.166 for all, upper division, and lower division courses, respectively.

Table III-55. Marginal Effects of Multinomial Logit Estimates for Change in Knowledge

Variable	All Courses			Upper Division Courses		
	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	-0.067	0.081	-0.014	-0.097	0.123	-0.026
ActInvolve	0.016	-0.019	0.002	0.050	-0.058	0.009
Entertain	-0.053	0.071	-0.018	-0.018	0.046	-0.028
Ask	0.010	-0.009	-0.001	0.029	-0.025	-0.005
Answer	-0.058	0.069	-0.011	-0.101	0.111	-0.009
Fair	-0.073	0.062	0.011	-0.103	0.102	0.001
CalledOn	0.058	-0.076	0.018	0.068	-0.096	0.028
Focus	0.033	-0.027	-0.006	0.047	-0.027	-0.020
Visual	0.053	-0.040	-0.013	0.055	-0.042	-0.013
Stories	0.024	-0.036	0.013	-0.048	0.023	0.024
Classroom	0.011	-0.016	0.004	-0.018	0.010	0.008
Distractions	0.020	-0.013	-0.007	0.022	-0.003	-0.019
Attendance	0.023	-0.026	0.003	-0.004	-0.010	0.014
Grade	0.050	-0.035	-0.014	0.123	-0.091	-0.031
Transferred Hours	0.023	-0.024	0.001	0.041	-0.038	-0.003
OSU Semesters	-0.010	0.009	0.001	0.002	0.000	-0.002

Table III-56. Multinomial Logit Estimates of a Positive Change in Assignments Relative to No Change in Assignments

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	0.197	0.384	-1.013	0.689	0.776	0.643
Syllabus	0.753***	0.187	0.630***	0.224	1.203***	0.431
ActInvolve	0.280	0.199	0.293	0.283	0.648*	0.338
Entertain	0.309	0.202	0.004	0.281	0.104	0.363
Ask	-0.071	0.155	-0.100	0.197	0.080	0.325
Answer	0.155	0.179	0.142	0.235	-0.052	0.333
Fair	0.074	0.197	0.294	0.270	-0.091	0.339
CalledOn	0.093	0.159	-0.040	0.198	0.298	0.331
Focus	-0.006	0.141	-0.069	0.194	0.068	0.247
Visual	0.052	0.168	-0.123	0.216	0.132	0.343
Stories	0.213	0.182	0.334	0.242	0.225	0.321
Classroom	-0.240	0.153	-0.450**	0.210	-0.107	0.289
Distractions	0.075	0.124	0.278	0.169	-0.193	0.275
Attendance	0.244	0.195	0.109	0.258	0.118	0.354
Grade	-0.318	0.199	-0.571*	0.307	-0.197	0.330
Transferred Hours	-0.111*	0.058	0.009	0.084	-0.237**	0.113
OSU Semesters	-0.080	0.057	0.084	0.091	-0.246*	0.132
N	341		179		162	
-2LL	471.115		271.526		140.807	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.402, 0.417 and 0.526 for all, upper division, and lower division courses, respectively.

Table III-57. Multinomial Logit Estimates of a Negative Change in Assignments Relative to No Change in Assignments

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.606***	0.446	-1.422	1.042	-3.134*	1.756
Syllabus	-0.066	0.251	-0.329	0.363	-0.909	0.753
ActInvolve	-0.534**	0.253	-0.948**	0.377	-1.102	1.135
Entertain	-0.645**	0.287	-0.473	0.409	-2.331**	1.171
Ask	0.037	0.210	-0.076	0.296	2.735**	1.333
Answer	0.108	0.250	-0.053	0.352	-0.663	0.899
Fair	-0.097	0.285	-0.022	0.421	-1.539	1.007
CalledOn	0.129	0.234	0.573*	0.311	-2.420**	1.077
Focus	-0.367*	0.214	0.096	0.314	-1.266**	0.603
Visual	-0.182	0.249	-0.175	0.333	0.830	0.983
Stories	-0.037	0.245	-0.154	0.346	0.344	0.684
Classroom	-0.392*	0.237	-0.371	0.327	-0.877	0.641
Distractions	-0.018	0.186	-0.311	0.262	0.771*	0.443
Attendance	0.275	0.308	0.573	0.452	1.392	1.140
Grade	0.088	0.317	0.233	0.496	0.608	0.776
Transferred Hours	-0.093	0.086	-0.082	0.125	-0.563	0.358
OSU Semesters	0.050	0.042	-0.066	0.154	0.243**	0.121
N	341		179		162	
-2LL	471.115		271.526		140.807	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.402, 0.417 and 0.526 for all, upper division, and lower division courses, respectively.

Table III-58. Marginal Effects of Multinomial Logit Estimates for Change in Assignments

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	-0.156	0.180	-0.023	-0.134	0.166	-0.031	-0.182	0.182	0.000
ActInvolve	-0.051	0.081	-0.030	-0.044	0.097	-0.053	-0.098	0.098	0.000
Entertain	-0.055	0.090	-0.035	0.010	0.013	-0.023	-0.016	0.016	0.000
Ask	0.014	-0.018	0.003	0.024	-0.023	-0.001	-0.012	0.012	0.000
Answer	-0.034	0.034	0.000	-0.031	0.037	-0.006	0.008	-0.008	0.000
Fair	-0.014	0.020	-0.006	-0.066	0.074	-0.008	0.014	-0.014	0.000
CalledOn	-0.021	0.018	0.003	-0.005	-0.024	0.029	-0.045	0.045	0.000
Focus	0.007	0.008	-0.015	0.013	-0.019	0.006	-0.010	0.010	0.000
Visual	-0.008	0.017	-0.009	0.032	-0.026	-0.005	-0.020	0.020	0.000
Stories	-0.044	0.051	-0.007	-0.072	0.087	-0.016	-0.034	0.034	0.000
Classroom	0.056	-0.046	-0.010	0.110	-0.103	-0.007	0.016	-0.016	0.000
Distractions	-0.015	0.018	-0.003	-0.055	0.077	-0.022	0.029	-0.029	0.000
Attendance	-0.055	0.050	0.005	-0.038	0.013	0.025	-0.018	0.018	0.000
Grade	0.065	-0.077	0.012	0.123	-0.148	0.025	0.030	-0.030	0.000
Transferred Hours	0.025	-0.024	-0.001	0.000	0.004	-0.004	0.036	-0.036	0.000
OSU Semesters	0.016	-0.020	0.004	-0.017	0.023	-0.005	0.037	-0.037	0.000

Table III-59. Multinomial Logit Estimates of a Positive Change in Tests Relative to No Change in Tests

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	1.019***	0.388	0.627	0.740	1.649**	0.644
Syllabus	0.627***	0.197	0.581**	0.237	0.695*	0.410
ActInvolve	0.084	0.202	-0.071	0.281	0.429	0.356
Entertain	-0.149	0.209	-0.267	0.288	-0.313	0.406
Ask	0.016	0.161	-0.103	0.196	0.615*	0.350
Answer	-0.027	0.187	-0.065*	0.229	-0.179	0.388
Fair	0.304	0.221	0.527	0.303	-0.087	0.390
CalledOn	0.161	0.171	0.214	0.200	-0.088	0.356
Focus	-0.017	0.154	-0.097	0.210	0.091	0.248
Visual	-0.008	0.177	-0.051	0.226	0.155	0.343
Stories	0.378**	0.189	0.630**	0.258	0.076	0.323
Classroom	-0.217	0.161	-0.228	0.208	-0.275	0.316
Distractions	0.184	0.133	0.197	0.165	0.226	0.281
Attendance	0.161	0.205	0.110	0.274	0.253	0.388
Grade	0.031	0.224	-0.029	0.317	0.144	0.372
Transferred Hours	-0.048	0.060	-0.034	0.089	0.046	0.131
OSU Semesters	-0.066	0.055	-0.027	0.100	-0.160	0.119
N	341		179		162	
-2LL	452.141		253.722		162.660	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.371, 0.418 and 0.395 for all, upper division, and lower division courses, respectively.

Table III-60. Multinomial Logit Estimates of a Negative Change in Tests Relative to No Change in Tests

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.342***	0.483	0.545	1.082	-1.651*	0.911
Syllabus	-0.101	0.244	-0.174	0.360	-0.012	0.535
ActInvolve	0.024	0.283	-0.613	0.408	0.986*	0.589
Entertain	-0.338	0.304	-0.236	0.449	-0.909	0.605
Ask	0.340	0.245	0.083	0.323	1.435**	0.572
Answer	-0.221	0.283	-0.121	0.374	-0.754	0.600
Fair	-1.061***	0.317	-1.235**	0.512	-1.660***	0.606
CalledOn	0.035	0.253	0.111	0.338	-0.147	0.528
Focus	-0.656***	0.230	-1.120***	0.407	-0.200	0.418
Visual	0.450*	0.270	0.566	0.383	0.547	0.576
Stories	0.618**	0.272	0.991**	0.397	0.379	0.531
Classroom	-0.067	0.239	0.032	0.352	0.078	0.489
Distractions	0.028	0.202	0.149	0.292	-0.315	0.460
Attendance	0.169	0.317	0.534	0.471	-0.066	0.590
Grade	-0.347	0.330	-0.108	0.487	-0.549	0.561
Transferred Hours	0.042	0.088	-0.212	0.146	0.332*	0.193
OSU Semesters	0.031	0.039	-0.338**	0.164	0.103	0.073
N	341		179		162	
-2LL	452.141		253.722		162.660	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.371, 0.418 and 0.395 for all, upper division, and lower division courses, respectively.

Table III-61. Marginal Effects of Multinomial Logit Estimates for Change in Tests

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	-0.093	0.123	-0.030	-0.110	0.132	-0.023	-0.064	0.081	-0.017
ActInvolve	-0.013	0.015	-0.002	0.021	0.001	-0.022	-0.042	0.026	0.017
Entertain	0.026	-0.015	-0.011	0.054	-0.052	-0.002	0.031	-0.014	-0.017
Ask	-0.006	-0.010	0.016	0.019	-0.025	0.006	-0.061	0.036	0.024
Answer	0.006	0.003	-0.010	0.014	-0.011	-0.003	0.019	-0.002	-0.016
Fair	-0.035	0.099	-0.065	-0.087	0.149	-0.062	0.013	0.031	-0.044
CalledOn	-0.025	0.029	-0.005	-0.042	0.044	-0.002	0.009	-0.007	-0.002
Focus	0.009	0.023	-0.032	0.031	0.009	-0.041	-0.008	0.015	-0.008
Visual	-0.004	-0.019	0.023	0.003	-0.026	0.023	-0.016	0.005	0.011
Stories	-0.063	0.047	0.016	-0.133	0.112	0.021	-0.008	0.000	0.009
Classroom	0.033	-0.038	0.005	0.043	-0.051	0.007	0.025	-0.034	0.009
Distractions	-0.028	0.034	-0.006	-0.040	0.039	0.000	-0.020	0.034	-0.014
Attendance	-0.026	0.024	0.002	-0.027	0.010	0.018	-0.023	0.031	-0.008
Grade	-0.001	0.019	-0.018	0.007	-0.003	-0.003	-0.012	0.030	-0.019
Transferred Hours	0.007	-0.011	0.004	0.009	-0.002	-0.007	-0.005	-0.003	0.008
OSU Semesters	0.010	-0.014	0.004	0.009	0.003	-0.012	0.014	-0.021	0.007

Table III-62. Multinomial Logit Estimates of a Positive Change in Involved Relative to No Change in Involved

	All Courses		Upper Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-0.505	0.390	-0.732	0.756
Syllabus	0.238	0.177	0.169	0.233
ActInvolve	0.888***	0.208	1.346***	0.343
Entertain	0.218	0.194	-0.007	0.292
Ask	0.111	0.159	0.307	0.211
Answer	0.125	0.186	0.110	0.254
Fair	0.123	0.194	-0.160	0.279
CalledOn	-0.036	0.162	-0.225	0.216
Focus	0.244*	0.136	0.069	0.204
Visual	-0.042	0.165	-0.484**	0.237
Stories	0.392**	0.181	0.550**	0.270
Classroom	-0.024	0.146	0.094	0.204
Distractions	-0.164	0.123	-0.111	0.166
Attendance	0.096	0.184	0.045	0.264
Grade	-0.083	0.191	-0.230	0.318
Transferred Hours	0.039	0.058	0.041	0.093
OSU Semesters	-0.057	0.054	0.015	0.099
N	341		179	
-2LL	469.923		266.646	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.411 and 0.428 for all and upper division courses, respectively.

Table III-63. Multinomial Logit Estimates of a Negative Change in Involved Relative to No Change in Involved

	All Courses		Upper Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.278**	0.559	-0.567	0.917
Syllabus	-0.308	0.256	-0.524	0.345
ActInvolve	-1.125***	0.290	-0.684**	0.357
Entertain	0.162	0.284	-0.351	0.387
Ask	-0.254	0.216	-0.241	0.246
Answer	-0.248	0.263	-0.277	0.305
Fair	-0.524*	0.292	-0.496	0.400
CalledOn	0.332	0.242	0.357	0.278
Focus	0.164	0.220	-0.075	0.305
Visual	-0.104	0.248	-0.409	0.330
Stories	0.007	0.258	0.385	0.315
Classroom	-0.133	0.242	-0.154	0.299
Distractions	0.234	0.195	0.379	0.250
Attendance	0.126	0.298	0.065	0.417
Grade	-0.099	0.316	-0.130	0.470
Transferred Hours	-0.093	0.092	-0.129	0.119
OSU Semesters	-0.083	0.085	-0.127	0.135
N	341		179	
-2LL	469.923		266.646	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.411 and 0.428 for all and upper division courses, respectively.

Table III-64. Marginal Effects of Multinomial Logit Estimates for Change in Involved

Variable	All Courses			Upper Division Courses		
	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	-0.050	0.065	-0.015	-0.018	0.055	-0.038
ActInvolve	-0.187	0.243	-0.056	-0.264	0.344	-0.081
Entertain	-0.053	0.051	0.002	0.014	0.008	-0.022
Ask	-0.021	0.032	-0.011	-0.057	0.081	-0.024
Answer	-0.025	0.036	-0.011	-0.014	0.034	-0.021
Fair	-0.020	0.041	-0.021	0.052	-0.025	-0.027
CalledOn	0.003	-0.015	0.012	0.035	-0.064	0.029
Focus	-0.059	0.058	0.001	-0.012	0.019	-0.007
Visual	0.011	-0.009	-0.003	0.118	-0.106	-0.012
Stories	-0.090	0.098	-0.007	-0.131	0.122	0.009
Classroom	0.008	-0.004	-0.004	-0.015	0.027	-0.012
Distractions	0.034	-0.045	0.011	0.010	-0.037	0.027
Attendance	-0.024	0.022	0.003	-0.012	0.009	0.003
Grade	0.021	-0.019	-0.002	0.054	-0.052	-0.002
Transferred Hours	-0.007	0.011	-0.004	-0.004	0.013	-0.009
OSU Semesters	0.015	-0.013	-0.002	0.001	0.007	-0.008

Table III-65. Multinomial Logit Estimates of a Positive Change in Workload Relative to No Change in Workload

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	0.007	0.340	-1.375*	0.714	0.429	0.599
Syllabus	0.577***	0.180	0.409*	0.226	1.112***	0.385
ActInvolve	0.123	0.180	0.380	0.265	-0.146	0.310
Entertain	0.188	0.192	0.015	0.279	0.020	0.322
Ask	0.205	0.153	0.190	0.194	0.468	0.308
Answer	0.103	0.177	0.072	0.239	0.090	0.323
Fair	0.241	0.188	0.351	0.269	0.058	0.325
CalledOn	-0.083	0.158	-0.188	0.203	-0.188	0.289
Focus	0.175	0.134	-0.011	0.196	0.317	0.202
Visual	0.137	0.163	0.064	0.220	0.134	0.296
Stories	0.347**	0.176	0.427*	0.248	0.431	0.285
Classroom	-0.186	0.147	-0.186	0.204	-0.401	0.254
Distractions	-0.022	0.122	0.016	0.162	-0.017	0.225
Attendance	0.035	0.188	-0.081	0.265	0.023	0.326
Grade	-0.045	0.201	-0.105	0.313	-0.151	0.326
Transferred Hours	-0.074	0.056	0.048	0.086	-0.159	0.111
OSU Semesters	-0.027	0.044	0.180*	0.094	-0.207*	0.117
N	341		179		162	
-2LL	501.081		291.889		158.775	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.367, 0.379 and 0.474 for all, upper division, and lower division courses, respectively.

Table III-66. Multinomial Logit Estimates of a Negative Change in Workload Relative to No Change in Workload

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.458***	0.508	-1.113	0.878	-4.095**	1.673
Syllabus	-0.462*	0.236	-0.542*	0.316	-0.352	0.668
ActInvolve	-0.054	0.240	-0.508	0.314	1.119	0.922
Entertain	-0.524*	0.282	-0.176	0.369	-1.968**	0.995
Ask	0.145	0.203	0.297	0.262	0.302	0.689
Answer	-0.290	0.237	-0.637**	0.299	0.210	0.725
Fair	-0.213	0.279	-0.019	0.389	-0.170	0.669
CalledOn	0.328	0.215	0.544*	0.274	-0.875	0.967
Focus	0.165	0.208	0.164	0.277	0.680	0.644
Visual	-0.082	0.233	-0.068	0.279	-0.173	0.707
Stories	0.140	0.239	0.128	0.301	0.967	0.871
Classroom	-0.006	0.213	-0.127	0.279	1.002	0.750
Distractions	-0.307*	0.176	-0.328	0.229	-0.469	0.636
Attendance	0.279	0.282	0.489	0.390	0.086	0.817
Grade	-0.166	0.288	0.805*	0.473	-2.866***	1.110
Transferred Hours	0.064	0.078	0.010	0.108	0.181	0.206
OSU Semesters	-0.025	0.066	-0.021	0.131	-0.319	0.297
N	341		179		162	
-2LL	501.081		291.889		158.775	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.367, 0.379 and 0.474 for all, upper division, and lower division courses, respectively.

Table III-67. Marginal Effects of Multinomial Logit Estimates for Change in Workload

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	-0.108	0.157	-0.049	-0.065	0.124	-0.060	-0.204	0.208	-0.004
ActInvolve	-0.024	0.032	-0.008	-0.060	0.116	-0.056	0.026	-0.030	0.004
Entertain	-0.027	0.065	-0.038	0.004	0.011	-0.015	-0.002	0.009	-0.007
Ask	-0.045	0.044	0.001	-0.051	0.035	0.016	-0.086	0.086	0.000
Answer	-0.015	0.036	-0.021	0.009	0.044	-0.054	-0.017	0.016	0.001
Fair	-0.045	0.066	-0.022	-0.072	0.088	-0.016	-0.011	0.011	-0.001
CalledOn	0.010	-0.032	0.023	0.018	-0.069	0.051	0.035	-0.033	-0.003
Focus	-0.039	0.036	0.003	-0.004	-0.010	0.013	-0.059	0.057	0.002
Visual	-0.026	0.036	-0.010	-0.011	0.019	-0.008	-0.024	0.025	-0.001
Stories	-0.074	0.079	-0.005	-0.094	0.101	-0.008	-0.080	0.078	0.002
Classroom	0.038	-0.045	0.007	0.043	-0.041	-0.002	0.073	-0.077	0.005
Distractions	0.011	0.006	-0.017	0.009	0.018	-0.027	0.003	-0.002	-0.002
Attendance	-0.013	-0.002	0.015	-0.002	-0.041	0.042	-0.004	0.004	0.000
Grade	0.013	-0.005	-0.008	-0.009	-0.060	0.068	0.030	-0.020	-0.010
Transferred Hours	0.014	-0.020	0.007	-0.010	0.011	-0.001	0.029	-0.030	0.001
OSU Semesters	0.006	-0.006	0.000	-0.037	0.046	-0.009	0.038	-0.038	-0.001

Table III-68. Multinomial Logit Estimates of a Positive Change in Worthwhile Relative to No Change in Worthwhile

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-0.700**	0.341	-1.996**	0.781	-0.499	0.531
Syllabus	0.827***	0.195	0.724***	0.243	0.852*	0.411
ActInvolve	0.122	0.201	0.354	0.309	0.298	0.329
Entertain	0.516*	0.208	0.421	0.312	0.265	0.342
Ask	-0.003	0.163	0.135	0.216	-0.150	0.321
Answer	-0.140	0.189	0.096	0.261	-0.639*	0.335
Fair	0.443**	0.202	0.334	0.302	0.770**	0.335
CalledOn	0.095	0.168	-0.287	0.233	0.539*	0.304
Focus	0.000	0.147	-0.244	0.218	0.197	0.239
Visual	-0.077	0.168	-0.208	0.225	0.250	0.316
Stories	0.116	0.189	0.326	0.269	-0.018	0.334
Classroom	0.050	0.154	0.034	0.216	0.149	0.274
Distractions	-0.192	0.129	-0.230	0.182	-0.188	0.250
Attendance	0.194	0.197	-0.059	0.279	0.434	0.338
Grade	-0.080	0.209	-0.402	0.352	0.250	0.356
Transferred Hours	-0.106*	0.059	0.030	0.094	-0.231*	0.109
OSU Semesters	0.033	0.035	0.178*	0.100	0.052	0.045
N	341		179		162	
-2LL	513.594		279.225		177.778	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.405, 0.424 and 0.498 for all, upper division, and lower division courses, respectively.

Table III-69. Multinomial Logit Estimates of a Negative Change in Worthwhile Relative to No Change in Worthwhile

	All Courses		Upper Division Courses		Lower Division Courses	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-0.897**	0.402	-1.712*	0.901	-1.510*	0.841
Syllabus	0.186	0.208	0.066	0.282	0.379	0.518
ActInvolve	-0.200	0.219	-0.414	0.298	-0.030	0.440
Entertain	-0.375	0.241	-0.177	0.351	-0.363	0.477
Ask	0.107	0.183	0.374	0.250	0.199	0.448
Answer	0.140	0.218	-0.031	0.296	0.245	0.522
Fair	-0.551**	0.242	-0.824**	0.384	-0.979*	0.519
CalledOn	0.109	0.201	0.397	0.274	-0.558	0.477
Focus	-0.640***	0.188	-0.361	0.261	-1.421***	0.438
Visual	0.225	0.221	0.320	0.300	0.910*	0.498
Stories	-0.226	0.219	-0.219	0.302	-0.832*	0.505
Classroom	-0.219	0.195	-0.084	0.263	-0.519	0.420
Distractions	-0.144	0.162	-0.489**	0.220	0.643*	0.334
Attendance	0.129	0.257	0.437	0.359	-0.056	0.545
Grade	-0.595**	0.270	-0.090	0.396	-1.574	0.603
Transferred Hours	-0.139*	0.073	-0.057	0.107	-0.183***	0.180
OSU Semesters	-0.004	0.047	0.097	0.124	-0.112	0.165
N	341		179		162	
-2LL	513.594		279.225		177.778	

Note: Three asterisks denote significance at the 1% level, two asterisks at the 5% level, and one asterisk at the 10% level.
Pseudo-R^2 values are 0.405, 0.424 and 0.498 for all, upper division, and lower division courses, respectively.

Table III-70. Marginal Effects of Multinomial Logit Estimates for Change in Worthwhile

	All Courses			Upper Division Courses			Lower Division Courses		
Variable	No Change	Decrease	Increase	No Change	Decrease	Increase	No Change	Decrease	Increase
Syllabus	-0.171	0.196	-0.025	-0.071	0.119	-0.048	-0.119	0.098	0.021
ActInvolve	-0.014	0.041	-0.026	0.032	0.098	-0.130	-0.015	0.048	-0.033
Entertain	-0.083	0.148	-0.065	-0.009	0.088	-0.079	0.041	0.071	-0.113
Ask	-0.005	-0.006	0.011	-0.068	-0.010	0.078	-0.022	-0.040	0.062
Answer	0.021	-0.042	0.021	-0.004	0.019	-0.016	0.003	-0.119	0.116
Fair	-0.061	0.140	-0.079	0.096	0.130	-0.227	0.107	0.201	-0.309
CalledOn	-0.024	0.018	0.006	-0.036	-0.085	0.120	0.055	0.130	-0.185
Focus	0.030	0.034	-0.064	0.075	-0.010	-0.065	0.218	0.152	-0.369
Visual	0.004	-0.031	0.027	-0.031	-0.064	0.095	-0.164	-0.040	0.204
Stories	-0.012	0.041	-0.029	0.005	0.076	-0.081	0.136	0.068	-0.205
Classroom	0.001	0.024	-0.025	0.010	0.013	-0.023	0.074	0.067	-0.142
Distractions	0.044	-0.040	-0.004	0.093	0.003	-0.097	-0.092	-0.084	0.176
Attendance	-0.044	0.041	0.003	-0.061	-0.049	0.110	-0.020	0.071	-0.051
Grade	0.044	0.012	-0.055	0.048	-0.062	0.014	0.239	0.173	-0.412
Transferred Hours	0.027	-0.019	-0.008	0.006	0.010	-0.016	0.045	-0.020	-0.026
OSU Semesters	-0.006	0.008	-0.002	-0.030	0.022	0.008	0.015	0.017	-0.032

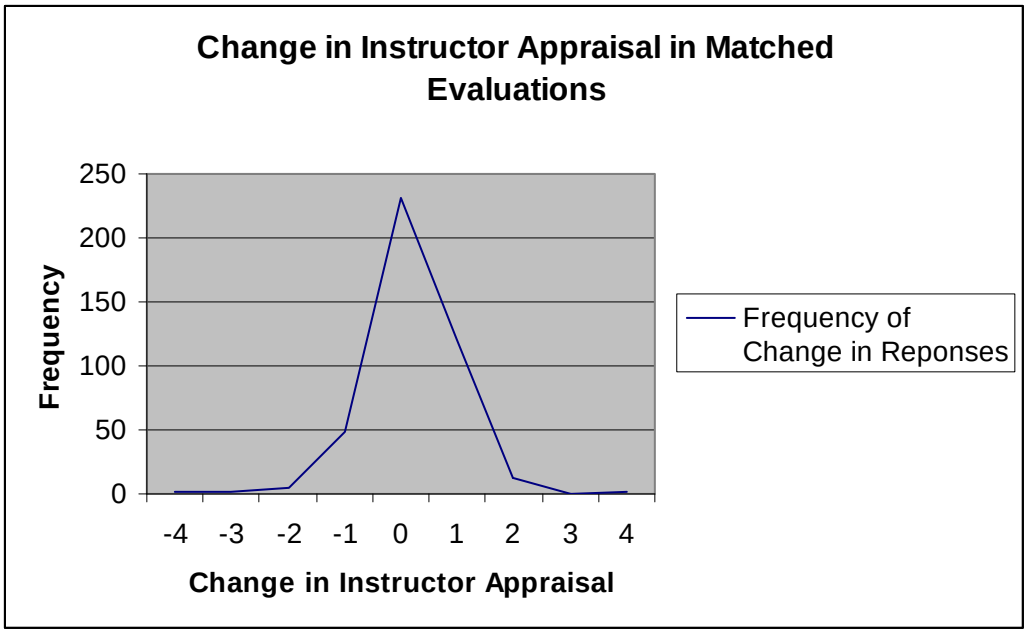

Figure III-1. Change in Instructor Appraisal Among Matched Evaluations in All Courses

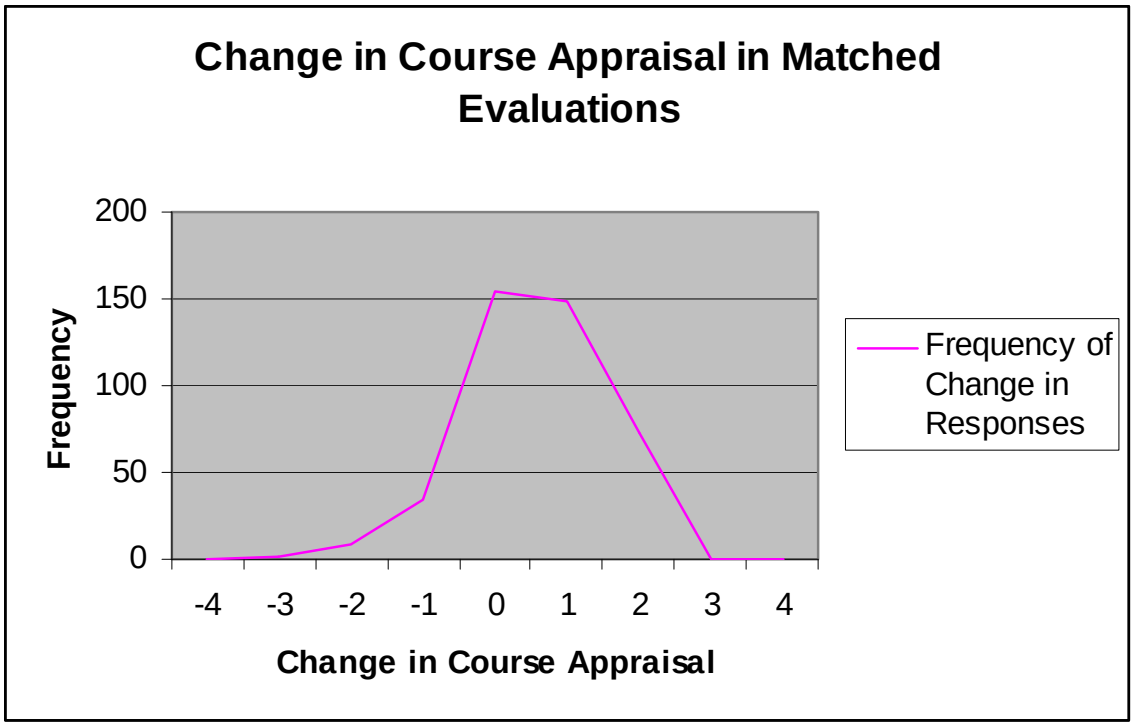

Figure III-2. Change in Course Appraisal Among Matched Evaluations in All Courses

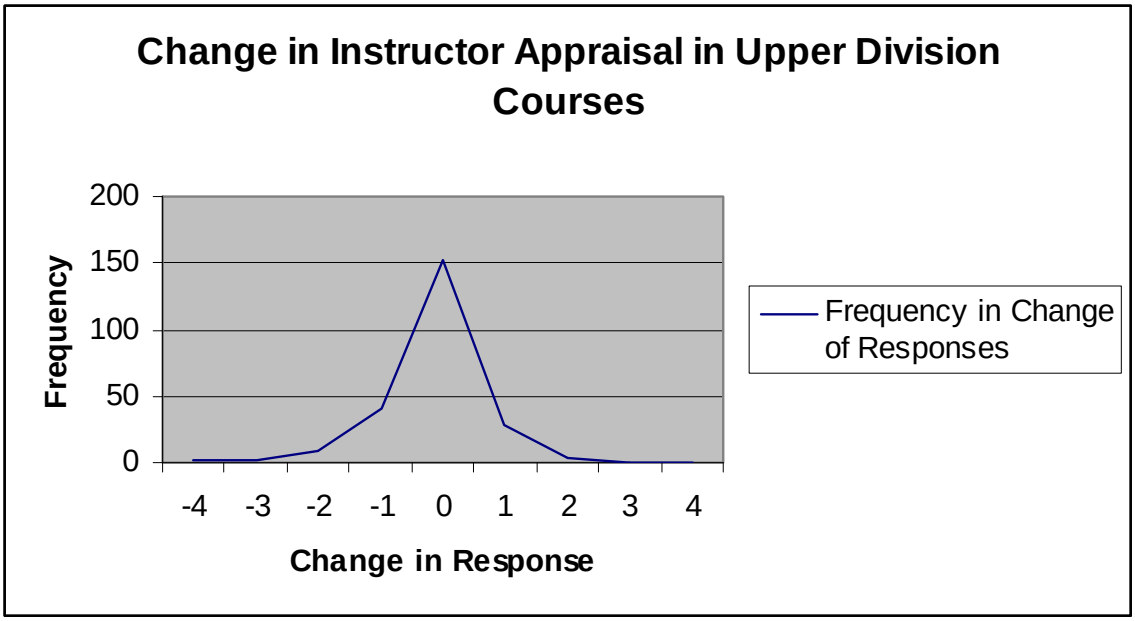

Figure III-3. Change in Instructor Appraisal Among Matched Evaluations in Upper Division Courses

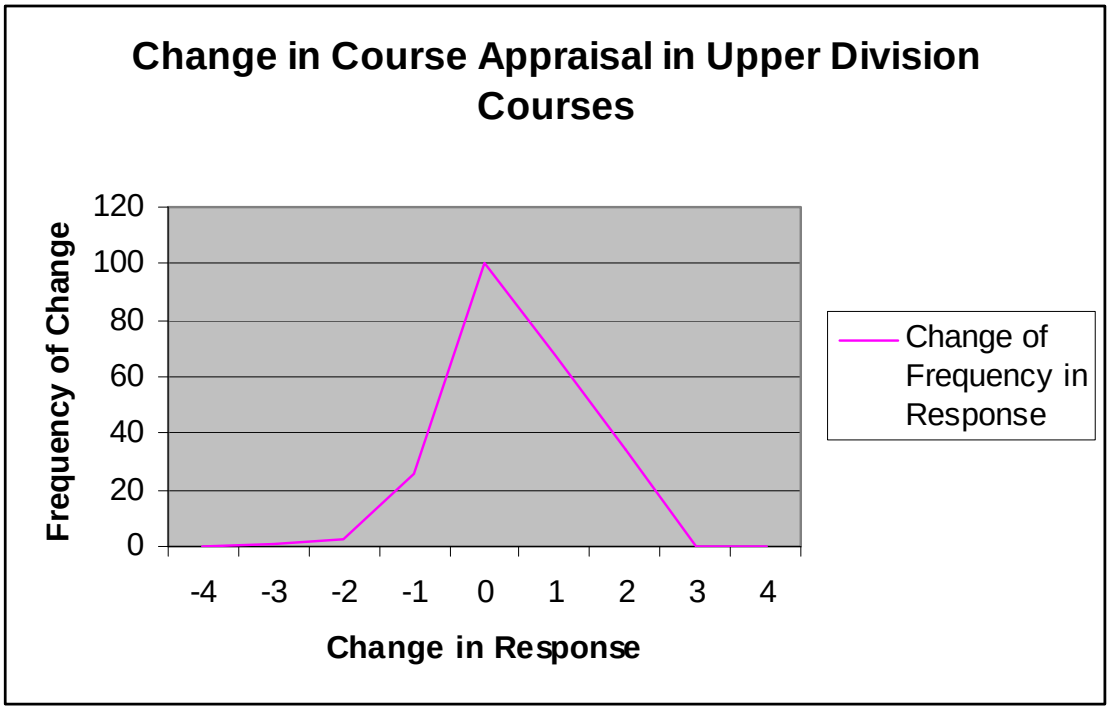

Figure III-4. Change in Course Appraisal Among Matched Evaluations in Upper Division Courses

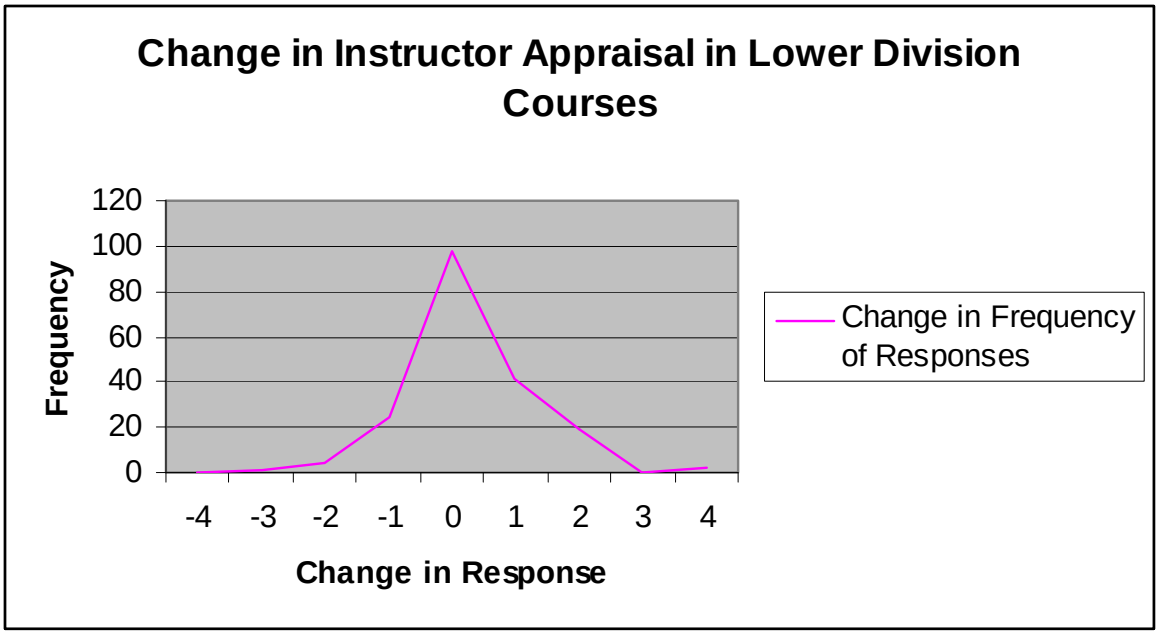

Figure III-5. Change in Instructor Appraisal among Matched Evaluations in Lower Division Courses

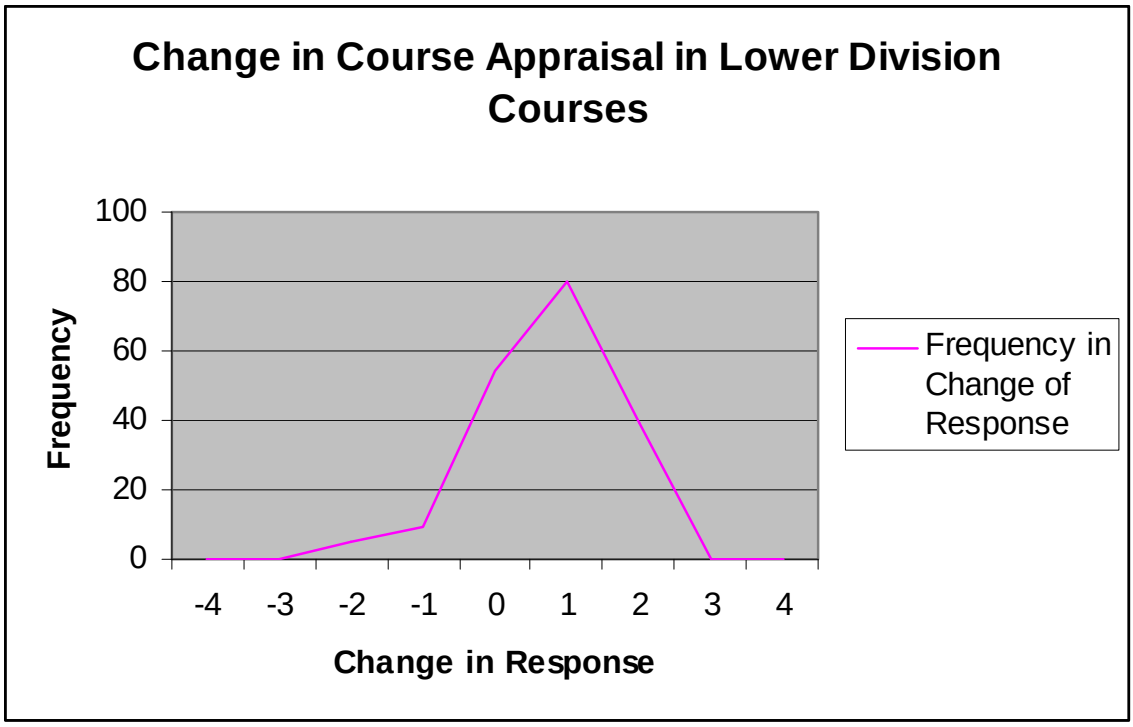

Figure III-6. Change in Course Appraisal among Matched Evaluations in Lower Division Courses

APPENDIX

Appendix 1—Initial IRB Approval of Research

Oklahoma State University Institutional Review Board

Date:	Thursday, July 26, 2007
IRB Application No	AG0727
Proposal Title:	The Effect of First Impressions on Faculty Course Evaluations
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 7/25/2008

Principal Investigator(s)

J. Ross Pruitt
421H Ag Hall
Stillwater, OK 74078

Michael R. Dicks
314 Ag Hall
Stillwater, OK 74078

Dan Tilley
422 Ag Hall
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☑ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Sue C Jacobs

Sue C. Jacobs, Chair
Institutional Review Board

Appendix 2—IRB Approval of Modification to Research

Oklahoma State University Institutional Review Board

Date	Sunday, September 30, 2007	Protocol Expires:	7/25/2008
IRB Application	AG0727		
Proposal Title:	The Effect of First Impressions on Faculty Course Evaluations		

Reviewed and Processed as: Exempt
Modification

Status Recommended by Reviewer(s) **Approved**

Principal Investigator(s) :

J. Ross Pruitt	Michael R. Dicks	Dan Tilley
421H Ag Hall	314 Ag Hall	422 Ag Hall
Stillwater, OK 74078	Stillwater, OK 74078	Stillwater, OK 74078

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

Signature : Sue C Jacobs

Sue C. Jacobs, Chair, OSU Institutional Review Board

Sunday, September 30, 2007
Date

Appendix 3—IRB Consent Form

You are about to participate in a research study entitled "The Effect of First Impressions on Faculty Course Evaluations." This research study that will occur twice in the current semester with the final questionnaire to be completed in the last few weeks of the current semester. Each questionnaire will take approximately five to ten minutes to complete. We understand that you have answered some of these questions previously, but please take the time to fill them out again.

The information that we collect from you will be confidential, anonymous, and will not influence the grade you receive in the class. The information will be used to improve the class and how it is organized. Some of you may receive evaluations for this class only while others may receive evaluations for all other classes except for this one. If you receive an evaluation for all other courses, do NOT evaluate this course or instructor. Please be honest in your evaluations as confidentiality of your responses will be maintained.

This survey will be scored by machine. Please be sure to fill the bubbles in completely with a pencil. Stray marks and errors must be erased completely for the machine to correctly read your response. Please read the instructions at the top of your form before beginning as this evaluation is slightly different from years past.

The identification code asked for by the evaluation is unique to each student, but it will never be known by the instructor of this course. This code number is not associated with your name as your name is not required. It is a five digit alphanumeric code with the first digit being the first letter of the high school you graduated from. For example, someone that graduated from Broken Arrow High School would use the letter "B". The second and third digits are your birth month expressed as a two digit number, e.g. January is 01 and October is 10. The final two digits are the last two numbers of your student identification number. Failure to include your identification number will cause your evaluation to not be scored. The code number is necessary so that we can associate your responses at the beginning and end of the class so that we can measure changes in your responses over time. As with all class evaluation materials, participation is voluntary and will not influence the grade you receive.

By completing this questionnaire, you are consenting to allow your information to be used in publications about this pilot project and evaluation of the project. Furthermore, by completing a questionnaire you are certifying that you are at least 18 years of age. Information identifying individuals will not be released in publications and presentations. Completion of this questionnaire is completely voluntary.

The results of this survey will be used to benefit students by improving instruction. Thank you.

Your opinions are important to us and we look forward to your participation. Should you have questions about participation in the class and associated evaluation project, please feel free to call any of the people listed below and they will be glad to answer your questions.

Daniel Tilley, Professor
Department of Agricultural Economics
(405)747-0374
daniel.tilley@okstate.edu

Ross Pruitt
Department of Agricultural Economics
(405)744-9809
ross.pruitt@okstate.edu

If you have questions about your rights as a research volunteer, you may contact:

Dr. Sue C. Jacobs, IRB Chair,
219 Cordell North
Stillwater, OK 74078
405-744-1676
irb@okstate.edu.

Appendix 4—Initial Questionnaire

Initial questionnaire

STUDENT SURVEY OF INSTRUCTION – OKLAHOMA STATE UNIVERSITY

Student surveys are conducted for every instructor and course at Oklahoma State University. Information gained from this survey will be useful to the instructor, the department, students, and administrators responsible for instruction at OSU. You are asked to give some information about yourself, then your views of the INSTRUCTOR and then your views of the COURSE.

All questions below are to be answered by blackening *with a #2 pencil* the appropriate answer space at the bottom of the page. Please make broad *pencil* marks that completely fill the area indicated. Do not mark beyond the edges of the circles, and erase any pencil marks you wish to delete.

Your identification code is based on the first letter of the high school you graduated from, the month you were born in expressed as two digits (January = 01, February = 02, etc.), and the last two digits of your student identification number. Your instructor will never see your identification number or will see your individual answers.

Please enter your code here: _____

FOR items 1 through 10 mark your responses in answer spaces 1 through 5 below.

1. My gender is: A *Male* B *Female* — Ⓐ Ⓑ

2. My instructor's gender: A *Male* B *Female* — Ⓐ Ⓑ

3. My college is: A *Agriculture* B *Arts and Sciences* C *Business* D *Education* E *Engineering* F *Graduate* G *Human Environmental Sciences* H *School of Technology* I *Veterinary Medicine* J *None of these* — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ Ⓗ Ⓘ Ⓙ

4. Classification: A *Freshman* B *Sophomore* C *Junior* D *Senior* E *Graduate or Special* — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

5. Purpose for taking course: A *Major* B *Related to Major* C *General Studies* D *Elective* — Ⓐ Ⓑ Ⓒ Ⓓ

6. Course was required: A *Yes* B *No* — Ⓐ Ⓑ

7. Type of course: A *Lecture* B *Lab* C *IPI* D *Short Course* E *Other* — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

8. I have had a course in this subject before: A *Yes* B *No* — Ⓐ Ⓑ

9. I have taken a course taught by this instructor before: A *Yes* B *No* — Ⓐ Ⓑ

10. I usually give lower ratings to instructors who require a lot of work: A *Yes* B *No* — Ⓐ Ⓑ

11. I think that courses that require a lot of work are more valuable than courses that do not: A *Yes* B *No* C *Undecided* — Ⓐ Ⓑ Ⓒ

FOR items 12 through 18 RANK THE INSTRUCTOR using this scale:
(A) Very High (B) High (C) Average (D) Low (E) Very Low

12. Preparation and effort — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

13. Effort devoted to teaching — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

14. Presentation of material — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

15. Knowledge of subject — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

16. Ability to explain subject matter — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

17. Positive attitude toward students — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

18. Overall INSTRUCTOR appraisal — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Re-enter your identification number from the previous page here: _____

FOR items 19 through 37 give your views of THE COURSE using this scale:
(A) *Definitely yes* **(B)** *Yes* **(C)** *Undecided* **(D)** *No* **(E)** *Definitely no* **(F)** *Not applicable*

19. The workload is appropriate for the hours of credit.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
20. Assignments are relevant and useful.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
21. Testing and evaluation procedures are good.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
22. Students are adequately involved.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
23. This course is worthwhile to me.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
24. Overall, this is a good COURSE.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
25. I signed up for this course because:	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
(A) *I like the professor's teaching style*	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
(B) *Required & only section*	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
(C) *Professor recommended by friend*	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
(D) *Professor recommended by website*	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
(E) *Professor recommended by another professor*	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
(F) *Subject of interest to me*	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
(G) *I thought it easy to make good grade*	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
26. The syllabus is an active reflection of the course experience.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
27. The instructor is able to actively involve me in class.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
28. The instructor is entertaining.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
29. I don't like to ask questions during class time.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
30. I don't like to answer questions during class time.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
31. The instructor treats students fairly	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
32. I don't like to be called on during class time.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
33. I am able to maintain focus in class.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
34. Learning in this class is aided by charts, graphs, and presentations.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
35. Learning in this class is aided by stories, games, and real world applications.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
36. The classroom negatively impacts my perception of the course and instructor.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
37. Distractions from other students negatively impact my perceptions of the course.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
38. I expect to miss the following number of classes this semester:	Ⓐ Ⓑ Ⓒ Ⓓ
A *0 to 2 classes* B *3 to 4 classes* C *5 to 7 classes* D *More than 7 classes*	
39. I expect my grade to be:	Ⓐ Ⓑ Ⓒ Ⓓ Ⓕ

Appendix 5—Control Questionnaire

STUDENT SURVEY OF INSTRUCTION – OKLAHOMA STATE UNIVERSITY

Student surveys are conducted for every instructor and course at Oklahoma State University. Information gained from this survey will be useful to the instructors, the department, students, and administrators responsible for instruction at OSU. You are asked to give some information about yourself, THEN YOUR GENERAL VIEWS OF YOUR INSTRUCTORS AND COURSES THUS FAR THIS SEMESTER. Evaluate all classes you are taking excluding this particular class. Do NOT include this class or instructor in the group of classes you are evaluating.

All questions below are to be answered by blackening *with a #2 pencil* the appropriate answer space at the bottom of the page. Please make broad *pencil* marks that completely fill the area indicated. Do not mark beyond the edges of the circles, and erase any pencil marks you wish to delete.

Your identification code is based on the first letter of the high school you graduated from, the month you were born in expressed as two digits (January = 01, February = 02, etc.), and the last two digits of your student identification number. Your instructor will never see your identification number or will see your individual answers.

Please enter your code here: _____

FOR items 1 through 7 mark your responses in answer spaces 1 through 5 below.

1. My gender is: A *Male* B *Female* — Ⓐ Ⓑ

2. I have instructors of both genders: A *Yes* B *No* — Ⓐ Ⓑ

3. My college is: A *Agriculture* B *Arts and Sciences* C *Business* D *Education* E *Engineering* F *Graduate* G *Human Environmental Sciences* H *School of Technology* I *Veterinary Medicine* J *None of these* — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ Ⓗ Ⓘ Ⓙ

4. Classification: A *Freshman* B *Sophomore* C *Junior* D *Senior* E *Graduate or Special* — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

5. I have had courses in these subjects before: A *Yes* B *No* — Ⓐ Ⓑ

6. I usually give lower ratings to instructors who require a lot of work: A *Yes* B *No* — Ⓐ Ⓑ

7. I think that courses that require a lot of work are more valuable than courses that do not: A *Yes* B *No* C *Undecided* — Ⓐ Ⓑ Ⓒ

FOR items 8 through 14 RANK THE INSTRUCTORS using this scale:
(A) Very High (B) High (C) Average (D) Low (E) Very Low

8. Preparation and effort — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

9. Efforts devoted to teaching — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

10. Presentation of materials — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

11. Knowledge of subjects — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

12. Ability to explain subject matters — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

13. Positive attitude toward students — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

14. Overall appraisal of INSTRUCTORS — Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Re-enter your identification number from the previous page here: _____

FOR items 15 through 33 give your views of THE COURSES using this scale:
(A) *Definitely yes* **(B)** *Yes* **(C)** *Undecided* **(D)** *No* **(E)** *Definitely no* **(F)** *Not applicable*

15. Workloads are appropriate for the hours of credit. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

16. Assignments are relevant and useful. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

17. Testing and evaluation procedures are good. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

18. Students are adequately involved. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

19. These courses are worthwhile to me. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

20. Overall, these are good COURSES. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

21. I signed up for these courses because: Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

(A) *I like the professors' teaching style* Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

(B) *Required & only section* Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

(C) *Professors recommended by friend* Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

(D) *Professors recommended by website* Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

(E) *Professors recommended by another professor* Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

(F) *Subjects are of interest to me* Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

(G) *I thought it easy to make good grade* Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

22. The syllabus for each class is an active reflection of the course experience. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

23. Instructors are able to actively involve me in class. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

24. The instructors are entertaining. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

25. I don't like to ask questions during class time. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

26. I don't like to answer questions during class time. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

27. The instructors treat students fairly. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

28. I don't like to be called on during class time. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

29. I am able to maintain focus in classes. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

30. Learning in these classes are aided by charts, graphs, and presentations. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

31. Learning in these classes are aided by stories, games, and real world applications. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

32. The classrooms negatively impact my perception of the courses and instructors. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

33. Distractions from other students negatively impact my perceptions of these courses. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

34. I expect to miss the following number of classes in each class this semester: Ⓐ Ⓑ Ⓒ Ⓓ

A *0 to 2 classes* B *3 to 4 classes* C *5 to 7 classes*
D *More than 7 classes*

35. I expect my grade point average to be: Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

A *4.0* B *3.0-3.99* C *2.0-2.99* D *1.0 to 1.99*
E *Less than 1.0*

Appendix 6—Final Questionnaire

STUDENT SURVEY OF INSTRUCTION – OKLAHOMA STATE UNIVERSITY

Student surveys are conducted for every instructor and course at Oklahoma State University. Information gained from this survey will be useful to the instructor, the department, students, and administrators responsible for instruction at OSU. You are asked to give some information about yourself, then your views of the INSTRUCTOR and then your views of the COURSE.

All questions below are to be answered by blackening *with a #2 pencil* the appropriate answer space at the bottom of the page. Please make broad *pencil* marks that completely fill the area indicated. Do not mark beyond the edges of the circles, and erase any pencil marks you wish to delete.

Your identification code is based on the first letter of the high school you graduated from, the month you were born in expressed as two digits (January = 01, February = 02, etc.), and the last two digits of your student identification number. Your instructor will never see your identification number or will see your individual answers. Please enter the same code as done earlier in the semester.

Please enter your code here: _____

FOR items 1 through 7 mark your responses in answer spaces 1 through 9 below.

1. My college is: A *Agriculture* B *Arts and Sciences* C *Business* D *Education* E *Engineering* F *Graduate* G *Human Environmental Sciences* H *School of Technology* I *Veterinary Medicine* J *None of these*

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ Ⓗ Ⓘ Ⓙ

2. Classification: A *Freshman* B *Sophomore* C *Junior* D *Senior* E *Graduate or Special*

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

3. Purpose for taking course: A *Major* B *Related to Major* C *General Studies* D *Elective*

Ⓐ Ⓑ Ⓒ Ⓓ

4. Course was required: A *Yes* B *No*

Ⓐ Ⓑ

5. Type of course: A *Lecture* B *Lab* C *IPI* D *Short Course* E *Other*

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

6. I missed the following number of classes this semester:
A *1 to 2 classes* B *3 to 4 classes* C *5 to 7 classes* D *More than 7 classes*

Ⓐ Ⓑ Ⓒ Ⓓ

7. My grade in this course will likely be:

Ⓐ Ⓑ Ⓒ Ⓓ Ⓕ

8. I transferred the following number of hours to OSU:
A *0 hours* B *1 to 10 hours* C *11 to 20 hours* D *21 to 30 hours* E *31 to 40 hours* F *41 to 50 hours* G *51 to 60 hours* H *More than 60 hours*

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ Ⓗ

9. I have been at OSU this many semesters including the current semester (fill in the blank): _____

FOR items 10 through 16 RANK THE INSTRUCTOR using this scale:
(A) Very High (B) High (C) Average (D) Low (E) Very Low

10. Preparation and effort Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
11. Effort devoted to teaching Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
12. Presentation of material Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
13. Knowledge of subject Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
14. Ability to explain subject matter Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
15. Positive attitude toward students Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
16. Overall INSTRUCTOR appraisal Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Final Questionnaire

Re-enter your identification number from the previous page here: _____

FOR items 17 through 39 give your views of THE COURSE using this scale:
(A) *Definitely yes* **(B)** *Yes* **(C)** *Undecided* **(D)** *No* **(E)** *Definitely no* **(F)** *Not applicable*

17. I learned a lot in this course.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
18. The workload was appropriate for the hours of credit.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
19. Assignments were relevant and useful.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
20. Testing and evaluation procedures were good.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
21. Students were adequately involved.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
22. This course was worthwhile to me.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
23. Overall, this was a good COURSE.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
24. My views on this COURSE improved over the course of the semester.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
25. My views on this INSTRUCTOR improved over the course of the semester.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
26. I would recommend this INSTRUCTOR to a friend.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
27. I would recommend this COURSE to a friend	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
28. The syllabus is an active reflection of the course experience.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
29. The instructor is able to actively involve me in class.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
30. I don't like to be called on during class time.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
31. I don't like to answer questions during class time.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
32. Learning in this class is aided by stories, games, and real world applications.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
33. The instructor is entertaining.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
34. Distractions from other students negatively impact my perceptions of the course.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
35. I don't like to ask questions during class time.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
36. Learning in this class is aided by charts, graphs, and presentations.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
37. The instructor treats students fairly.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
38. The classroom negatively impacts my perception of the course and instructor.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
39. I am able to maintain focus in class.	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

Final Questionnaire

Instructor's Name	Department	Course Number	Section

Part III. Please add any comments you wish about the following:

1. **Course**

2. **Instructor**

3. **Instruction**

4. **Teaching assistants**

5. **Laboratory, practicum, or discussion section**

6. **Work Load**

7. **Examinations**

8. **Grading**

9. **Textbook**

10. **Other comments**

Final Questionnaire

VITA

Jeremy Ross Pruitt

Candidate for the Degree of

Doctor of Philosophy

Thesis: ESSAYS ON BUSINESS LOCATION, RECRUITMENT, AND THE ROLE OF EVALUATIONS IN THE UNIVERSITY CLASSROOM

Major Field: Agricultural Economics

Biographical:

Personal Data: Born in Henderson, Kentucky, On January 6, 1981, the son of Byron and Brenda Pruitt.

Education: Graduated from Madisonville North Hopkins High School, Madisonville, Kentucky in June 1999; received Bachelor of Science degree in Agriculture with a minor in Business Administration from Western Kentucky University, Bowling Green, Kentucky in May 2003; received Master of Science in Agricultural Economics from Purdue University, West Lafayette, Indiana in December 2004. Completed the requirements for the Doctor of Philosophy or Education in Agricultural Economics at Oklahoma State University, Stillwater, Oklahoma in July, 2008.

Experience: Employed as an intern in the Kentucky Farm Business Management Program, 2002; employed as an intern by the Kentucky Department of Agriculture Division of Show and Fair Promotion, 2003; employed by Purdue University, Department of Agricultural Economics as a graduate research assistant, 2003 to 2004; employed by Oklahoma State University, Department of Agricultural Economics as a graduate research assistant, 2005 to present.

Professional Memberships: American Agricultural Economics Association, Southern Agricultural Economics Association, Western Economics Association

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Name: Jeremy Ross Pruitt Date of Degree: July, 2008

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: ESSAYS ON BUSINESS LOCATION, RECRUITMENT, AND THE ROLE OF EVALUATIONS IN THE UNIVERSITY CLASSROOM

Pages in Study: 254 Candidate for the Degree of Doctor of Philosophy

Major Field: Agricultural Economics

Scope and Method of Study: The purpose of the first essay is to determine the impact of the North American Free Trade Agreement on location decisions of U.S. confectionery manufacturers using county level data from 1993 to 2005. A random effects panel data Tobit model is used to test the null hypothesis. The second essay analyzes factors leading to the growth in employment and location decisions of new firms and expansion of existing firms in southeast Oklahoma. A generalized least squares model is used to measure factors affecting employment growth while a heteroskedastic Tobit model is used to measure factors affecting new firm locations and expansions of existing facilities from 1997 to 2005. The final essay focuses on whether or not students' first impressions of instructors and courses are lasting. An ordered probit model is used to test for factors that drive initial impressions and a multinomial logit model is used to determine the factors that lead to observed changes final evaluation scores.

Findings and Conclusions: The North American Free Trade Agreement is found to have a negative impact on location decisions of confectionery manufacturers in the U.S. from 1993 to 20005. However, other factors such as income, population, and other food manufacturing establishments are more important. The second essay finds that higher sales tax levels are prohibitive in explaining observed employment growth from 1997 to 2005. Counties in the state of Texas are also more likely to experience employment growth but less likely to attract new firms than counties in Oklahoma. The ten counties in Oklahoma that recently formed a regional consortium are significantly different from all other counties in Texas and Oklahoma at attracting new employment. Areas with higher per capita fire service expenditures and more manufacturing establishments are likely to attract new firms while factors affecting expansion of existing facilities include the population density. The final essay finds that students do change their minds on courses and instructors over the course of the semester. Gender bias is not present in determining initial impressions of an instructor/course although grade expectations can play a role in determining evaluations scores at any point in the semester.

ADVISER'S APPROVAL: Daniel Tilley