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Civic Attitude and Activity of Loma Linda University Dental Graduates

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by

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A thesis submitted in partial satisfaction of
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Each person whose signature appears below certifies that this thesis, in his opinion, is adequate in scope and quality as a thesis for the degree Master of Science.

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ABBREVIATIONS

ADA	American Dental Association
ADEA	American Dental Education Association
AJODO	American Journal of Orthodontics and Dentofacial Orthopedics
IRB	Institutional Review Board
LLU	Loma Linda University
NIDCR	National Institute of Dental and Craniofacial Research
NIH	National Institute of Health

ABSTRACT OF THE THESIS

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Master of Science, Graduate Program in Orthodontics and Dentofacial Orthopedics
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Dr. Joseph M. Caruso, Chairperson

Introduction: Dentistry is regarded as a profession and granted certain privileges, such as self-regulation. Associated with this status are stated and implied responsibilities which are widely debated. In recent years, dental professionalism seems to be on the decline. Evidence cited includes access-to-care issues and decreased public trust in dentists. In response, academia and professional organizations have developed curricula and statements intended to bolster professionalism. Meanwhile little is known about practicing dentists' attitudes or participation in health-related civic matters.

Objectives: This study seeks to examine the importance Loma Linda University (LLU) dental graduates place on public roles, their reported participation in public activities and the factors related to their responses.

Methods: Four hundred and fifty-six LLU dental graduates were surveyed. Civic-mindedness was ascertained from respondents' reported attitudes regarding community participation, political involvement and collective advocacy. Civic activity was determined from reported civic participation during the last three years. Additional responses were gathered on a number of health-related issues to assess the respondents' level of social concern beyond the immediate dental care needs of their patients.

Findings from this study were compared with those of a similar study of physicians from the US.[1]

Results: Overall, three quarters of LLU respondents were considered civic-minded and 91% participated in civic activities. Attitudes regarding civic obligations were very similar to the US physician group.[1] The LLU dental graduates, however, reported a higher level of civic action than did the US physicians[1] (91% vs. 65%). Regression analysis for civic-mindedness determined female gender and the specialties of pediatric dentistry and orthodontics were salient factors. Regression analysis for civic activity determined civic-mindedness, pediatric dentistry, and professional age greater than 20 years were related factors. The majority of LLU respondents, unlike US physicians,[1] deemed broader concerns not obviously tied to the health of their patients as important. The implications of these results as well as directions for future research were discussed.

CHAPTER ONE

REVIEW OF THE LITERATURE

"The dental profession by its very nature is a social enterprise, and its norms are the product of an ongoing dialogue between dentists and the larger community." Beemsterboer, 2006. [2]

"To define, describe, and evaluate the interaction between oral health and general health and well-being (quality of life), through the life span, in the context of changes in society." This charge guided the development of *Oral Health in America: A Report of the Surgeon General*, April 9, 2000.[3]

"The terms oral health and general health should not be interpreted as separate entities. Oral health is integral to general health; this report provides important reminders that oral health means more than healthy teeth and that you cannot be healthy without oral health." Donna Shalala, Secretary of Health and Human Services, preamble to the 2000 *Oral Health in America: A Report of the Surgeon General*.[4]

Introduction

Dental professionalism has faced several challenges over the years including concern that it may be declining.[5] A few purported signs of declining professionalism include access-to-care issues, the formation of mid-level dental care providers, and low public trust in dentistry and dentists. In the midst of this, dentistry has been said to be

merely a business with the core ideology of self-interest, and dentists are accused of placing the business of dentistry above the interests of the public.[6,7,8,9] In response, dental academic institutions maintain specific goals to develop dental professionals with the "implicit contract to serve the public good."[10] Dental organizations publish white papers yet declining public trust is unabated. The purpose of this literature review is to discuss the status of dental professionalism, address current and contested issues, and consider a different framework for evaluating this topic. Throughout the review, special attention will be given to the dental subspecialty of orthodontics, the author's current residency program, when such emphasis is interesting and relevant.

Definitions for dental professionalism are numerous. One definition provided by Welie, a dental ethicist, will serve our discussion well. He states, "A profession is a collective of expert service providers who have jointly and publicly committed to always give priority to the existential needs and interest of the public they serve above their own interests, and in turn are trusted by the public to do so."[11] This definition is very similar to civic-mindedness. Specifically, civic-mindedness is, "having, showing or actively carrying out one's concern for the condition and affairs of one's community."[12] If dentistry accepts the definition for "profession" and the implied charge of civic-mindedness, there is a significant level of independent responsibility that dentistry assumes regarding the public's interest. Additionally, dentistry's privilege of being self-regulated mandates stewardship of professionalism. Because there are concerns about declining professionalism in dentistry, it is important to identify and address these issues.

Access to Care

Improving access to care, regaining the public's trust, and producing ethical dental professionals are currently hot topics among policy makers, health educators, professional societies and practitioners. For the past few years, organized dentistry has faced increased pressure from both state and federal government to address the lack of care for certain segments of the American population. Medicine has faced similar pressure for a number of years and in response there have been many studies examining numerous causative factors and possible solutions.[13] Dentistry, however, has only relatively recently begun to research dental access factors. Public policy makers are challenging organized dentistry and becoming more focused on passing legislation in an attempt to solve access problems.[14,15] Concern regarding orthodontic access to care has remained in the shadows mostly because orthodontics is considered an elective health care service and thus has not garnered much attention at the national level. Nonetheless, as dentists and orthodontists, we are not precluded from the professional responsibility to evaluate the current level of care provided or ways to increase the availability of our services to all individuals in the United States.

While it is fairly common to hear the statement "Crooked teeth never killed anyone," most oral health professionals and most patients would assert that certain malocclusions require orthodontic care. Furthermore, most orthodontists would agree with Dr. William Profitt that malocclusion can cause social discrimination and oral malfunction (including pain) and can increase susceptibility to trauma, periodontal disease and tooth decay.[16] If the overall well-being of an individual includes optimal oral health then it is appropriate to address the previously-mentioned sequelae of

malocclusion. Unfortunately in the US, optimal health has a price tag that not all can afford. Although most states, in response to demand, have realized the importance of orthodontic care and now include orthodontic services in their dental coverage, reimbursement varies. The monetary element is only one of the myriad of pieces in the complex access-to-dental-care discussion.

Surgeon General's Directives for Oral Health

Many questions naturally arise when considering the subject of access to care relative to orthodontics. Initial questions include whether access to orthodontic care is a real problem. Who determines this answer? What do practicing orthodontists experience or believe regarding this issue? If the problem is real, then what is causing it? How do we fix it? The following points for consideration, relevant to all oral health-care providers, are taken directly out of the *2000 Oral Health in America: A Report of the Surgeon General* from the National Institute of Dental and Craniofacial Research (NIDCR):

- Dental, medical, and public health delivery systems each provide services that affect oral and craniofacial health in the US population. Clinical oral health care is predominantly provided by a private practice dental workforce.
- The public health infrastructure for oral health is insufficient to address the needs of disadvantaged groups, and the integration of oral and general health programs is lacking.

- Expansion of community-based disease prevention and lowering of barriers to personal oral health care are needed to meet the needs of the population.
- Eligibility for Medicaid does not ensure enrollment, and enrollment does not ensure that individuals obtain needed care. Barriers include patient and caregiver understanding of the value and importance of oral health to general health, low reimbursement rates, and administrative burdens for both patient and provider.
- The dentist-to-population ratio is declining, creating concern as to the capability of the dental workforce to meet the emerging demands of society and provide required services efficiently.
- An estimated 25 million individuals reside in areas lacking adequate dental care services, as defined by Health Professional Shortage Area criteria.
- Educational debt has increased, affecting both career choices and practice location.
- Disparities exist in the oral health profession workforce and career paths. The number of underrepresented minorities in the oral health professions is disproportionate to their distribution in the population at large.
- Reliable and valid measures of oral health outcomes do not exist and need to be developed, validated, and incorporated into practice and programs.[17]

Access-to-Care Factors

The National Health Interview Survey by the National Center for Health Statistics found that 63.6% of the interviewees had a dental visit in 2006. Individuals seeking and receiving dental care are typically ambulatory and healthy, have the financial means to pay for care and do not live in remote areas.[18] Obviously, this does not describe all needing care. In 1996, Manski et al. estimated that 1.4% of the US population were institutionalized, 8.7% had severe medical issues, 15.4% were economically disadvantaged, and 1.4% resided in remote regions.[19] According to the Surgeon General, "The burden of craniofacial, oral, and dental disease, particularly untreated disease, falls heaviest on lower socioeconomic status groups, which include disproportionately large numbers of racial and ethnic minorities."[20] It is reasonable to suggest this pattern is also true for those seeking orthodontic care. Indeed, in 2006 the American Association of Orthodontists adopted and posted an access-to-orthodontic-care white paper on their website.[21] This action indicates an awareness of a potential access controversy related to orthodontia at the national organization level.[22]

If you acknowledge that there is an access problem then logically the next step is to identify the contributing factors. In medicine and dentistry there can be many barriers to care which are both environmental and economic, both direct and indirect, and which affect both the individual seeking care as well as the provider.[23] The more common and significant factors affecting access to orthodontic care are insurance (including expected reimbursement from insurance), income, education level of individual or caregiver, geography (place of residence--urban, suburban, rural), age, and culture. Robinson in 2004 acknowledged similar factors when describing successful dental programs.

Specifically, such programs included three features: an "effective demand for dental care; an adequate dental work force able to respond to that demand; an economic environment that supports patients and providers so that they can participate in the program."[24]

Of the factors impeding access, the economic environment for both the practitioner and the patient provides possibly the greatest barrier to care.[25,26] Income and insurance coverage are directly related to receiving dental and orthodontic care.[27] According to the Surgeon General in 2000, "Medical insurance is a strong predictor of access to dental care. Uninsured children are 2.5 times less likely than insured children to receive dental care. Children from families without dental insurance are 3 times more likely to have dental needs than children with either public or private insurance. For each child without medical insurance, there are at least 2.6 children without dental insurance."[25] In 2004, 47 million Americans lacked health insurance while 108 million lacked dental insurance. Thirty-five percent of the population did not have dental insurance.[28] What portion of that 35% can afford dental care, let alone orthodontic care, is unknown. Regarding the burden to the practitioner, orthodontic students graduate with a sizable debt, which then increases if buying or starting a practice, and are forced to deal with practice expenses that further reduce their income.[29] All of these financial factors added together create an ever-widening gap between provider and patient.

Geography, yet another contributor to access-to-care problems, necessitates the question: Are there enough orthodontists and are they distributed adequately to deal with the demand for care? The US population has been growing at an average of 1.3% per year since 1900, with 0.97% projected for 2010.[30,31] The Census Bureau projects a 46%

increase in population between the years 2007 and 2050 (439 million).[32] According to the US Census Bureau, as of mid 2005, 81% of the US population resided in cities and suburbs. Between 1995 and 2006, there was a 13.3% increase in the number of active orthodontists (i.e., 1315 new orthodontists). Waldman et al. upon studying the geographical distribution of orthodontists concluded that "there are still major differences in practitioner-to-child population ratios in some geographic areas."[33] The 2008 American Dental Association (ADA) workforce survey found 7.6% of specialists (9.3% for general dentists) were "too busy to treat all people requesting appointments" while 24.8% of specialists were "not busy enough, *and* could have treated more patients."[34]

David Turpin, the Editor-in-Chief of the *American Journal of Orthodontics and Dentofacial Orthopedics* (AJODO), stated several statistics concerning need and demand in his editorial for the April 2010 issue. He noted that demand for orthodontic services is tied to changes in orthodontic fees and that most orthodontists polled could "sustain a 30% increase in new patients per week without jeopardizing quality of care." The number of orthodontists is projected to grow more rapidly than the numbers within crucial age groups who seek orthodontic care (ages 14-17 and 18-24). Turpin cautions that the number of orthodontic graduates should be considered along with the number of retiring orthodontists.[35] As noted earlier, however, whether or not there are enough orthodontists perhaps is complicated by other factors such as where they are located.

Understanding the intentions of new orthodontists could theoretically provide direction in decisions related to manpower. There have been at least four published studies in the US and one in Canada that have polled graduate orthodontic residents about training and future plans.[36,37,38] Graduates from professional schools, orthodontists

included, often remain within the geographic region of their residency. The fourth and most recent study of graduate orthodontists' future plans was published in the May 2010 issue of the AJODO. The authors surveyed a sampling of graduate residents and found: 1) most residents plan to enter private practice (32.35% as associates, 31.18% buying into an existing practice, 21% starting a practice); 2) 75.91% plan to practice in urban or suburban areas, 13.14% in a rural setting, and 2.92% in the inner city; 3) 42.34% wanted a solo practice, 30.66% preferred group practice, 26.28% were undecided; and 4) 92.75% intended full-time practice (3+ days/week).[39] The reality is that orthodontic graduates show no signs of a workforce pattern different from that already established. Urban markets will likely continue to be maintained or further saturated while rural markets will continue to be undermanned.

Finally, with regard to educational factors, Solomon and Ceen (2008) examined demographic variables of existing orthodontic practices and discovered there are more orthodontists where there are: 1) greater numbers of general dentists, 2) a larger population, 3) a higher percentage of educated individuals, and 4) higher economic levels.[40] Two factors stand out to this author when reading this article. First, there was a negative coefficient (i.e., fewer orthodontists) for areas where families had greater numbers of children (under age 18). Larger family size has been associated with lower socioeconomic status. More importantly, the population's education level had a higher explanatory power for the number of orthodontists than did the financial level. This indicates that there is a great need to educate people about the benefits of orthodontic care for oral health and overall well-being.

Efforts to solve access issues with midlevel practitioners are underway. Medicine succumbed to external demand to solve access issues by adding midlevel providers such as physician's assistants and nurse practitioners. Due to pressure from policy makers and lobbyists, dentistry is now in the early stages of creating and utilizing midlevel dental providers.[41] Of concern, little success has been shown from the introduction of these hybrid dental providers as improved access and reduction of costs have not been demonstrated.[42]

A Different Perspective

In short, orthodontia has not been spared the access-to-care challenges that concern dentistry as a whole. Sources reviewed document a number of contributing factors primarily related to need and including but not limited to demand, economic factors, and supply (workforce). Another body of literature challenges us to consider this issue from a different perspective. Could access to care be more of a psychosocial or moral problem rather than a marketplace shortfall?

Academics and Quality Health Professionals

Indeed, it appears that more practitioners in the field, regardless of level, will not solve access problems. As we consider a moral or psychological perspective, we are drawn to the possibility that what is needed instead of quantity is quality. Quality here refers to a higher level of professionalism. The American Dental Education Association's (ADEA) 2003 statement on professionalism identifies six values-based statements defining professionalism and has emphasized an increased focus on ethics for

student dentists. These values are competence, fairness, integrity, responsibility, respect and service-mindedness (civic-mindedness).[43] Of interest, more recently, research has demonstrated a high incidence of unprofessional conduct by students in oral health-professions education[44] and this unprofessional behavior in school is predictive of unprofessional behavior in practice.[4] In 2009, the American Student Dental Association observed, "…when schools recognize those with lofty GPA's, great board scores, and high clinical production, yet fail to give credit to those that exemplify high morals and professionalism, a message of what the school holds as its top priority is passed."[45] This practice certainly speaks to both academic standards and admission criteria and, given the research noted above, may have a long-term impact on the professionalism of the dental community.

The Business of Dentistry

Apart from the challenges of dental education, the profession faces a challenge that is inherent with service delivery. Dentistry traditionally has had a history of sole-practitioners following a private practice model. Within this model, if the dental practitioner is not fully aware of his/her relationship to the social environment, problems may arise and solutions may be overlooked. When the business model of dentistry is motivated primarily by profit, both the profession and the patient are placed in jeopardy. In addition, constantly increasing knowledge, technologies, and numbers of diseases have contributed to greater specialization in health-care professions.[46] For these reasons, some say dentistry is trending toward highly skilled technicians rather than professionals.

Regardless of this concern, it is important to recognize that dentistry is required to operate as a business in a market economy. The business model demands and requires a level of profitability to survive and continue providing care. Unfortunately, when profit for self becomes the driving force, the dentist becomes simply a *Knowledge Worker* and loses hold of the moral imperatives in professionalism. Drucker coined this term and defines a *knowledge worker* as a specialized, relatively independent, skilled worker accountable primarily to self.[47] Admittedly, maintaining a business while providing health care is complex. It is also a struggle, in a free-market economy, to balance the survivability of a practice with prioritizing the patients' interests. Nonetheless, as a medical professional, the main focus should be on service to society.[48]

Social and Professional Connections

Still other factors seek to separate dentists from their professional ideal. Dentistry, as a profession, appears quite separate from that of medicine even though most would agree that oral health is closely related to general health. For example, dentistry maintains a separate licensing body and professional association from that of medicine and there is also a defined separation between dental and medical academic institutions. Observing these phenomena, Rule and Welie propose that there exists a pervasive disconnectedness, or lack of civic-mindedness and civic action, between dentists and their patients, colleagues, local community and society as a whole. They suggest that lack of access to care is merely a symptom of this disconnectedness.[49] Similarly, a previous report from the ADEA in 2003 stated, "Reduced access to oral health care is one of the prices of professional isolation that has too often characterized dentistry." [50]

While much research has focused upon the motivational factors and practice location decisions of orthodontic residents in an effort to address access-to-care issues, little has been done to answer or examine the point brought out by Rule and Welie. To further quote the duo, "We submit that if dentists acquire a much more robust sense of connectedness that will be an important step in the reduction of oral health disparities."[51] Social isolationism demonstrated by minimal or absent civic-mindedness, includes a lack or absence of real communication in individual or group interactions with others. The ADA survey of orthodontists in 2006 found that 76.4% of 9,245 active orthodontists were solo practitioners.[52] Is this evidence of independence related to any form of social disconnection or decreased civic-mindedness? Certainly, being a sole practitioner in dentistry does not relegate either the individual or the profession to an oblivion that is disconnected from the needs of society. Also, access to care encompasses a variety of factors and it would be imprudent to suggest that being more socially connected would completely resolve the issue. However, if there is an imbalance that can be identified and rectified, then, as Rule and Welie suggest, we might see an overwhelming swell in professionalism and a desire to unify to address issues such as access to care. Determining how to measure connectedness and, conversely, disconnectedness is definitely worthy of our attention, at this juncture, and leads to a discussion of social capital.

Social Capital, Connectedness and Civic-Mindedness

Social capital (i.e., community connectedness) refers to social networks and the norms of reciprocity that arise from them. This includes the relationships people have

with others and the benefits these relationships can bring to the individual as well as to society. According to Harvard Kennedy School researchers, "A growing body of research literature over the last several years shows that social capital, and the trust, reciprocity, information, and cooperation associated with it, enables many important individual and social goods."[53] Whereas physical capital refers to physical objects, financial capital to money, and human capital refers to the properties of individuals, social capital refers to connections among individuals. Social networks give rise to norms of reciprocity and trustworthiness arises from the interconnections of individuals. Putnam postulates that "in that sense social capital is closely related to what some have called *civic virtue*."[54] He further believes, "the difference is that *social capital* calls attention to the fact that civic virtue is most powerful when embedded in a sense network of reciprocal social relations. A society of many virtuous but isolated individuals is not necessarily rich in social capital."[53]

The core idea that social networks can affect information flow and that repeated interactions within these networks can help resolve dilemmas of collective action are consistent with conventional economic theory. "Even the idea that networks can affect *identity*– if I interact more often with a group, I'm more likely to take their interests into account – is akin to some recent work on 'endogenous preferences' in economic theory."[55] Bowles defines *endogenous preferences* as, "preferences that cannot be taken as given, but are affected by individual internal responses to the external state of affairs. They are interdependent, in part determined by social institutions, marketing, and subject to learning (experience and observation) and habit formation (past-experience)."[56]

Social capital varies across people and communities. According to Putnam, one can refer to a person or a community as being generally high or low in social capital.[57] Communities with higher levels of social capital are likely to have higher educational achievement, better performing governmental institutions, faster economic growth, and less crime and violence. And the people living in these communities are likely to be happier and healthier, and to have a longer life expectancy.[52,58,59]

Harvard Kennedy School's Social Capital Community Benchmark Survey identified eleven different facets of social capital which are: "two dimensions of 'social trust' (whether you trust others), two measures of political participation (electoral political participation and participation in protest politics), two measures of civic leadership and associational involvement, a measure of giving and volunteering, a measure of faith-based engagement, a measure of informal social ties, a measure of the diversity of our friendships, and a measure of the equality of civic engagement at a community level."[60] It seems reasonable to apply these concepts in research targeting connectedness and the dental profession. As an aspect of professionalism, social capital has also been explored via public roles such as community participation, political involvement and collective advocacy.[1]

Community volunteerism and political involvement are of particular interest as previous research has found a positive correlation between these variables and social connectedness.[61] Regarding the former sentence, Grande and Armstrong found that physicians demonstrated values that favored volunteerism, however, less than half actually volunteered. In fact they found that after adjusting for socioeconomic standing, "physicians were significantly less likely to have performed community volunteer work

than the general public." [62] A survey of physicians by Gruen et al. found more than 90% of physicians regarded community participation, political involvement and collective advocacy as important whereas actual involvement was varied.[1] Gruen et al. discovered that almost 95% of physicians agreed that community participation (i.e., volunteering) is an important role for the medical profession.[1]

Lastly, given that values and beliefs typically guide actions, verifying how they are related to social connections, civic attitudes and civic actions is highly relevant. Australian researchers performed a health system and social values study on general dentists[63] by employing a values framework established by Priester.[64] The defined social framework included values identified as essential for any health system (fair access, quality, efficiency, respect for patients, patient advocacy) and values considered instrumental (personal responsibility, social solidarity, social advocacy, provider autonomy, consumer sovereignty, personal security) for achieving the essential values. Social science research further supports that social capital and civic engagement are highly intercorrelated.[65]

Public Trust

Finally, in this review of factors related to professionalism, it is paramount to visit perhaps the ultimate indicator of professional health--public trust. Gallup has run an annual survey asking, "Please tell me how you would rate the honest and ethical standards of people in these different fields--very high, high, average, low or very low?" This poll has been run annually since 1976. In 2010, nurses were ranked number one with 81% of respondents ranking them as very high or high. Physicians were at 66%

(i.e., 66% of respondents ranked them as very high or high). In 2006, dentists were thought trustworthy by 62% of those polled. In 2009, dentists were at 57%. In 2010, dentists were not included in the poll.[66] These levels of trust in physicians and dentists are alarming and unacceptable. The Edelman Trust Barometer survey found that when a company or profession is distrusted, 57% will believe negative information after hearing it 1-2 times while only 15% will believe positive information after hearing it 1-2 times. When a company or profession is trusted, however, 25% will believe negative information after hearing it 1-2 times and 51% will believe positive information after hearing it 1-2 times. This survey has also found that the average individual now trusts "a person like me" (someone like themselves) more so than doctors.[67] These findings confirm that trust is important, it protects reputation, and it is waning and below acceptable limits for physicians and dentists.

Summary

In summary, dental professionalism has been challenged. Access to care, unethical students and dentists, low public trust, and a profit over patient attitude are all symptoms or signs of a lack of professionalism in dentistry. Improving the quality and quantity of an individual's life is a basic directive for all health care providers. If polled, these professionals would tend to agree that each part of the body has an effect on the whole; there is a "connectedness." If pressed further, they would likely concur that all health professionals are also conjoined in the effort to address the need for care rather than simply the demand for care.

This study sought to provide a response to the action plan put forward by the Surgeon General, the NIH and the NIDCR. This "… plan emphasizes that eliminating oral health disparities requires more than an understanding of the biology and lifestyle of an individual, we also must take into account the community and neighborhood where the individual lives, works, and plays, as well as the larger social, cultural, and political environment."[68]

Purpose

The purpose of this study was to begin to evaluate and discuss social connectedness, namely civic attitudes and actions, of LLU-trained dentists, orthodontists and other dental specialists. Specifically, this project sought to determine the importance these oral health professionals place on public roles, their participation in related activities and the socio-demographic and practice factors related to their responses. Finally, findings of this study were compared to responses of US physicians in a previous investigation.[1]

Prior to this project, little was known regarding dental opinions concerning civic attitudes and actions. Data from this research should prove valuable in the collective oral health care discussion and as a starting point for future research on this topic in dentistry. In so doing, this study hopes to further stimulate discussion and insight into strengthening dental professionalism.

Hypotheses

Alternative Hypotheses

1. The majority of respondents will consider public roles of dentists, i.e., community participation, political involvement, and collective advocacy, as important.
2. The majority of respondents will report active participation in civic activities and public roles during the past three years.
3. The respondents surveyed will demonstrate similar responses to that of US physicians polled in a previous study by Gruen et al.[1]
4. The majority of respondents will deem as important broader health concerns that are not obviously tied to the oral health of their individual patients.

Null Hypotheses

1. The majority of respondents will not consider public roles of dentists, i.e., community participation, political involvement, and collective advocacy, as important.
2. The majority of respondents will not show participation in civic activities and public roles during the past three years.
3. The respondents surveyed will not demonstrate similar responses to that of US physicians polled in a previous study by Gruen et al.[1]
4. The majority of respondents polled will not deem as important broader health concerns not obviously tied to the oral health of their individual patients.

CHAPTER TWO

METHODS AND MATERIALS

Survey Questions

In accordance with the *Public Roles of US Physicians* study,[1] this investigation explored professionalism via civic-mindedness and civic activity. Specifically, it examined three particular realms of likely engagement by dentists: community participation, individual political involvement, and collective advocacy via a professional organization. Gruen et al.[1] used survey questions to assess the importance that US physicians placed on these various dimensions of social involvement. The current investigation employed some of the same questions and added new questions for use with a dental cohort.

Respondents recorded their attitudes regarding each dimension using a four-point Likert scale with the descriptors: not at all important, not very important, somewhat important, and very important. The following civic involvement questions were included in the survey and can be viewed in Table 1 or Appendix A as they appeared to participants via the Internet. One extra action question was created to elaborate on the initial action question for each of the three realms measuring public roles. Comments in parentheses below denote original material and modifications relative to Gruen et al.[1]

Community Participation

1. Attitude: How important is it for dentists and dental specialists to provide health-related expertise to local community organizations? (This question was modified to replace the word "physicians" with "dentists and dental specialists.")

2. Action: In the past three years have you provided volunteer dental or health-related expertise to any local community organizations?

3. Action: Please list you most recent volunteer contribution of dental- or health-related expertise to your local community. (This survey item is original.)

Political Involvement

1. Attitude: How important is it for dentists and dental specialists to be politically active (other than voting) in health-related matters at the local, state or national level? (This question was modified to replace the word "physicians" with "dentists and dental specialists.")

2. Action: In the past three years have you been politically active, other than voting, on a local dental or health care issue?

3. Action: Please list the dental or health issue for which you have most recently been politically active. (This survey item is original.)

Collective Advocacy

1. Attitude: How important is it for dentists and dental specialists to encourage dental organizations to advocate for the public's health? (This question was modified to replace the word "physicians" with "dentists and dental specialists.")

2. Action: In the past three years have you encouraged or been involved with your local professional society in addressing a public dental or health policy?

3. Action: Please list an instance of how you have encouraged your professional society's effort in addressing a public dental or health policy issue. (This survey item is original.)

Public Advocacy Topics

Participants were presented with a list of health- and dental-health-related issues under the heading *Issues for Advocacy* and were asked to rate the importance of advocating for each. Refer to Table 1 or Appendix A for specific questions related to these topics. Most of these topics were replicated from the Gruen et al. study.[1] Two additional questions were created to reflect specific dental concerns, namely, fluoridation of water and increasing the number of dental school graduates. Respondents rated the importance of each of the topics on the same Likert scale used for the civic involvement questions. The topics included in the survey are categorized below based on a stratification hypothesis in the Gruen et al. study.[1] The precise wording used for the survey can be found in Table 1. Again, commentary in the parentheses below denotes modified and original content.

1. Access to Care
    a. Medical and dental insurance for the uninsured ("dental" was added)
2. Direct Socioeconomic Influences
    a. Reduction in obesity and better nutrition
    b. Tobacco control

Table 1. Survey Questions.

Civic Attitude	
Community Participation	How important is it for dentists and dental specialists to provide volunteer health-related expertise to local community organizations?
Political Involvement	How important is it for dentists and dental specialists to be politically active (other than voting) in health related matters at the local, state, or national level?
Collective Advocacy	How important is it for dentists and dental specialists to encourage dental organizations to advocate for the public's health?
Civic Action	
Community Participation	In the past three years have you provided volunteer dental or health-related expertise to any local community organizations? Please list your most recent volunteer contribution of dental- or health-related expertise to your local community.
Political Involvement	In the past three years have you been politically active (other than voting) on a local dental or health care issue? Please list the dental- or health-issue for which you have most recently been politically active.
Collective Advocacy	In the past three years have you encouraged or been involved with your local professional society in addressing a public dental or health policy? Please list an instance of how you have encouraged your professional society's effort in addressing a public dental- or health-policy issue
Advocacy Topics	Please identify how important it is for you to individually or collectively advocate for the following issues.
Access to Care	How important is it to provide medical and dental care for the uninsured? How important is it to increase the number of graduating dentists in the US?
Direct Socioeconomic	How important is it to reduce obesity and improve nutrition in the US? How important is tobacco control? How important is it to have fluoridated water in the US?
Broader Socioeconomic	How important is it to reduce air pollution? How import is it to reduce unemployment in the US? How important is it to increase basic literacy in the US?

c. Fluoridation of public water sources (original topic)

3. Broader Socioeconomic influences

a. Increased basic literacy

b. Increased number of dental graduates (original topic)

c. Reduction in unemployment

d. Reduction in air pollution

Demographic Variables

For those who were currently practicing in dentistry or a related specialty, the following demographic characteristics were collected in the survey. Demographic information obtained included the following personal characteristics of the respondents: gender, ethnicity, years in practice, country of dental school graduation, area of dental practice or specialty, type of practice (i.e. solo, group, multi-specialty), number of locations of practice, percentage of patients uninsured or on government insurance, number of hours spent in direct patient care, and practice ZIP code. Please refer to Table 2 or Appendix A for exact questions used to elicit this information from the respondents.

Table 2. Demographic Question.

Demographic Variable	**Questions**
Personal Characteristics	
Gender	What is your gender?
Ethnicity	What is your ethnicity?
Professional Age	How long have you been practicing dentistry including your related specialty?
Country of Dental School Attended	Where did you receive your dental and/or specialty training?
Practice and Professional Characteristics	
General Dentist or Specialty	Please select your current area of practice in the field of dentistry.
Type of Practice	What is the type of practice structure you are involved with? Select all that apply.
Number of Practice Locations	How many locations do you practice at?
Patient Demographic-Payment	Approximately how many of your patients are uninsured or are covered by government assistance?
Number of Direct Patient Hours/Week	How many hours per week do you spend providing direct patient care?
Zip Code	What is the ZIP code of your primary place of practice?

Survey Questionnaire Development and Implementation

This initial questionnaire was subjected to review by a dentist, by a statistician and by an ethicist. Minor revisions were made and a trial run of the survey was

completed by two additional reviewers (one academic orthodontist and one social science professor). When ready for submission to the survey website, the final survey version was sent for approval to the LLU Institutional Review Board (IRB).

Following approval of the final survey instrument by IRB, an e-mail invitation was sent out to the subjects along with an electronic cover letter and fact sheet describing the study. Those choosing to participate did so by selecting an attached link that connected them to the customized survey at the surveymonkey website. All responses were anonymous and tied to a unique identifier for use in a random drawing for an incentive prize. Non-respondents were contacted via a weekly e-mail reminder and encouraged to participate. Survey access was closed after one month.

Upon request, the LLU Dental Alumni Association provided a list of dental graduates from 1975-2010 for the subject pool. From that master list, the survey invitation was sent electronically to all who had e-mail addresses. This provided a sample of 1233 dentists and specialists (Table 1). The survey was conducted only by electronic methods. This decision is supported by Kaplowitz et al. who found similar response rates between web and mail surveys.[69]

Analyses

For each respondent, responses to the three questions about civic attitudes were assigned points as follows: one point for "not at all important," two points for "not very important," three points for "somewhat important," and four points for "very important." In this study, unlike the *Public Roles of US Physicians* study,[1] political involvement, the second of the attitude questions, was divided into three separate levels—local, state and

national. Points assigned to the responses for these levels of this question were averaged to obtain a value for question two. On all three attitude questions combined, a respondent with a total score of ten or greater out of the twelve possible points (four points possible on each of the three questions) was classified as being civic-minded.

Civic action was also self-reported and participation in each of the categories during the past three years was ascertained by a yes or no response from the respondent. Responding "yes" to any of the civic activities in any of the three categories of public roles classified the respondent as civically active.

Respondents were asked to rate the importance of several dental or health issues that could be or have been topics for individual or collective advocacy. The topics fit a model representing domains of physician responsibility proposed by Gruen et al.[1] These researchers hypothesized that "physicians would rate as most important those factors, such as access to health care, that appear most directly relevant to the health of the individual patients."[1]

Logistic regression was performed to assess the associations between civic-mindedness and each respondent's personal, professional, and practice characteristics (demographic categories). Logistic regression was also used to examine which variables were significantly related to civic activity (civic-mindedness was considered a dichotomous variable--either present or not). Data was compiled into Numbers® (Apple Corporation) spreadsheet format and then statistical analyses were performed using the software package SAS® 19.0 (SAS Institute Incorporated). The confidence level used was 95% (α=0.05).

CHAPTER THREE

RESULTS

Survey Sample

Of the 1233 LLU dental graduates invited to participate, 456 responded and 424 provided complete or near complete surveys yielding an overall response rate of 41.3% (Table 3). The 424 respondents providing data for this study did not include 27 who were not actively practicing and five who failed to answer that question; these 32 surveys were excluded from the study (Table 4). For each survey question, the number of participants who responded to versus skipped that question are recorded in Tables 5 and 6.

Table 3. Survey Sample Profile by Specialty.

1975-2010 LLU Graduates	**Sample size**	**Population**
General DDS	900	*
Anesthesia	22	37
Endodontics	54	99
Oral Pathology	3	3
Oral Surgery	19	34
Orthodontics	120	210
Pediatrics	34	51
Periodontics	49	82
Prosthodontics	32	32
Totals	**1233**	*

*Unable to ascertain exact population due to redundancies in the list that was generated.

Table 4. Sample Sizes and Response Rates.

1975-2010 LLU Graduates	Sample size	Responded	Bounced	Opted Out	Response Percentage
General DDS	900	235	103	20	29.5%
Anesthesia	22	5			22.7%
Endodontics	54	21	2		40.4%
Oral Pathology	3	1			33.3%
Oral Surgery	19	15		2	78.9%
Orthodontics	120	77	21	8	77.8%
Pediatrics	34	34			100%
Periodontics	49	17	1		35.4%
Prosthodontics	32	14	2		46.7%
Did not identify specialty		37			
Totals	1233	456	129	30	

Table 5. Response Rate Characteristics for Demographics.

Question	Answered Question	Skipped Question
Currently practicing	451	5
Gender	416	8
Ethnicity	415	9
Zip Code of practice	412	12
Area of Specialty	419	5
Professional Age	415	9
Hours Worked per Week	415	9
Number of Practice Locations	413	11
Type of Practice Structure	413	11
Number of Patients Uninsured	412	12

Note: 456 started the survey and 424 completed the survey.

Table 6. Response Rate Characteristics for Survey Questions.

Question	Answered Question	Skipped Question
Volunteered in Past 3 Years	413	11
Politically Active in Past 3 Years	407	17
Collective Advocacy in Past 3 Years	411	13
List Most Recent Volunteer Activity	324	100
List Most Recent Political Activity	231	193
List Most Recent Collective Advocacy	199	225
Importance of Volunteering	398	26
Importance of Political Activity	397	27
Importance of Collective Advocacy	398	26
Opinion on Issues	397	27

Note: 456 started the survey and 424 completed the survey.

Relative to specialty, pediatric dentists demonstrated a 100% response rate followed by oral surgeons (78.9%) and orthodontists (77.8%). Anesthesiologists (22.7%) and general dentists (29.5%) had the lowest response rates. Due to small sample sizes, responses of anesthesiologists and oral pathologists were factored into the overall group analysis but were not analyzed by specialty group.

Characteristics of Respondents

Approximately 78% of the dental respondents were men. Regarding ethnic distribution (Figure 1), the largest groups were Caucasian (70%) and Asian (23%). The largest professional group responding was general dentistry (235 respondents out of 797); though their response rate was low, they comprised 56% of the participants (Figures 2 and 3). Respondents were almost equally divided between those who had been in professional practice for more than 20 years versus those who had practiced 20 or fewer years (Figures 4 and 5). More than half the respondents (57%) practiced less than or equal to 32 hours per week, and 68% of respondents practiced at a single location. The sole-practitioner was the predominant practice type at 58.5% (Figures 6 and 7). Responses indicated 83% of respondents practiced in metropolitan (urban) areas with 92% residing in the Western United States. Of respondents, 59% said that 25% or less of their patients were uninsured or on government assistance. Pediatric dentistry treated more of those patients than other specialties; over half of pediatric dentists had a patient pool in which greater than 25% were uninsured or on government assistance (Figure 8).

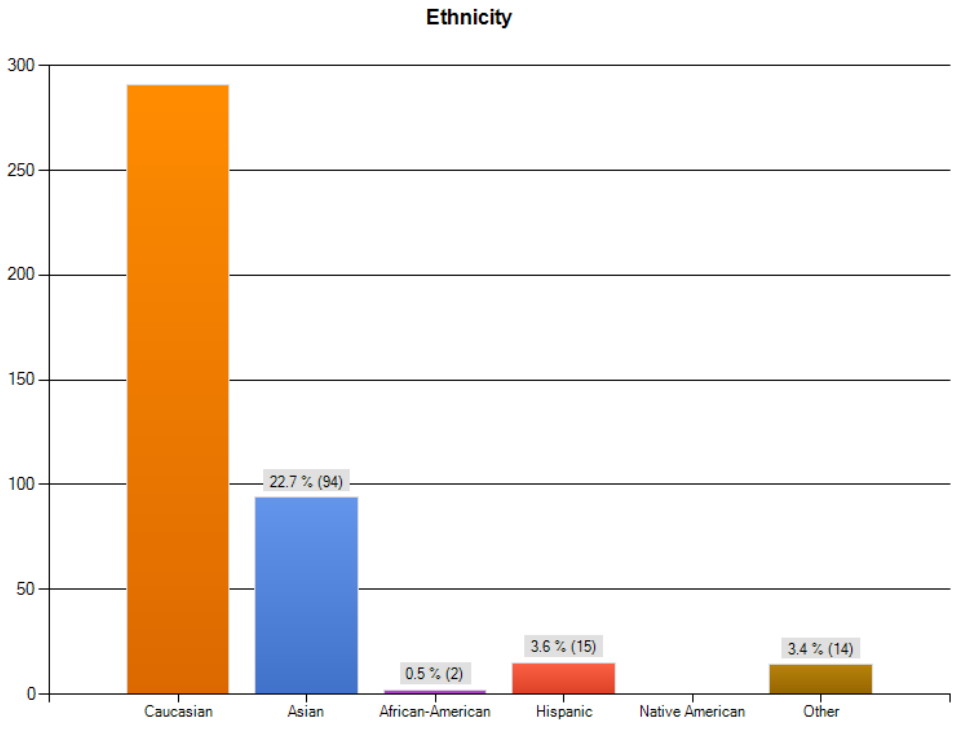

Figure 1. Ethnicity.

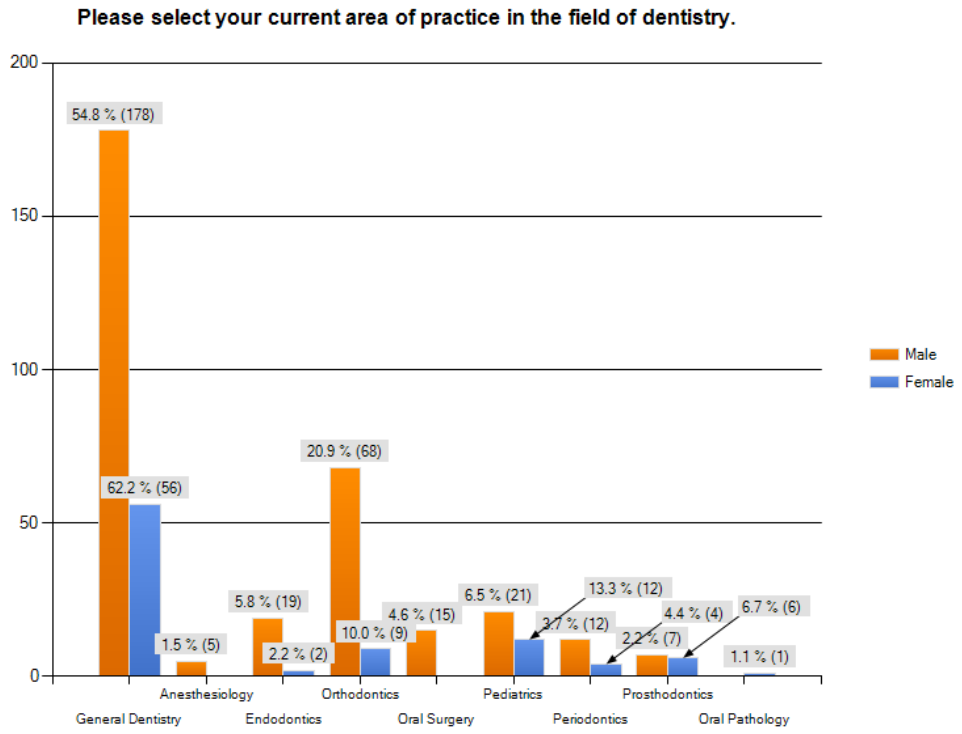

Figure 2. Area of Specialty in Dentistry by Gender.

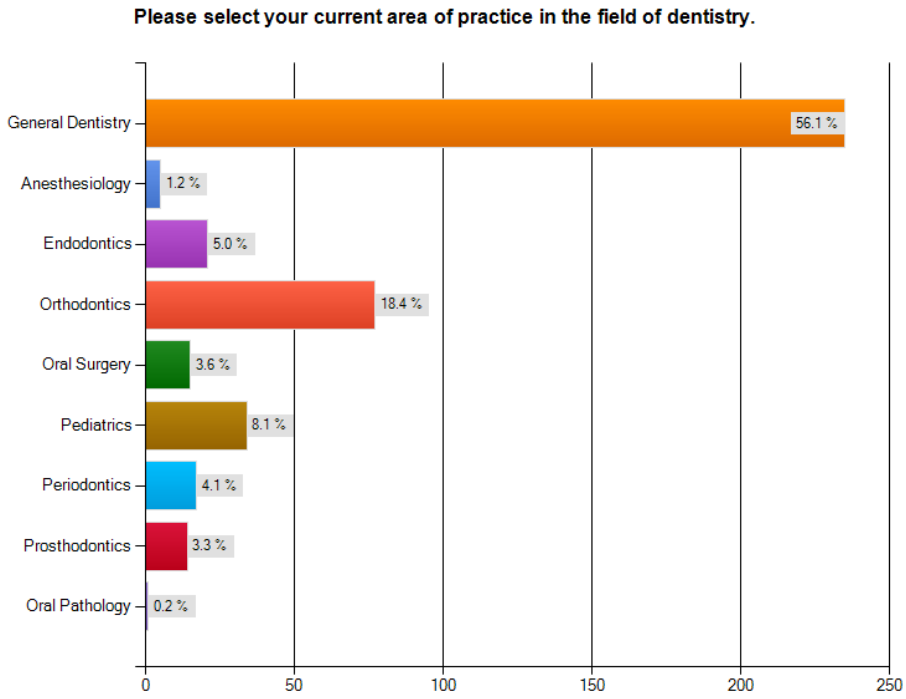

Figure 3. Area of Specialty in Dentistry.

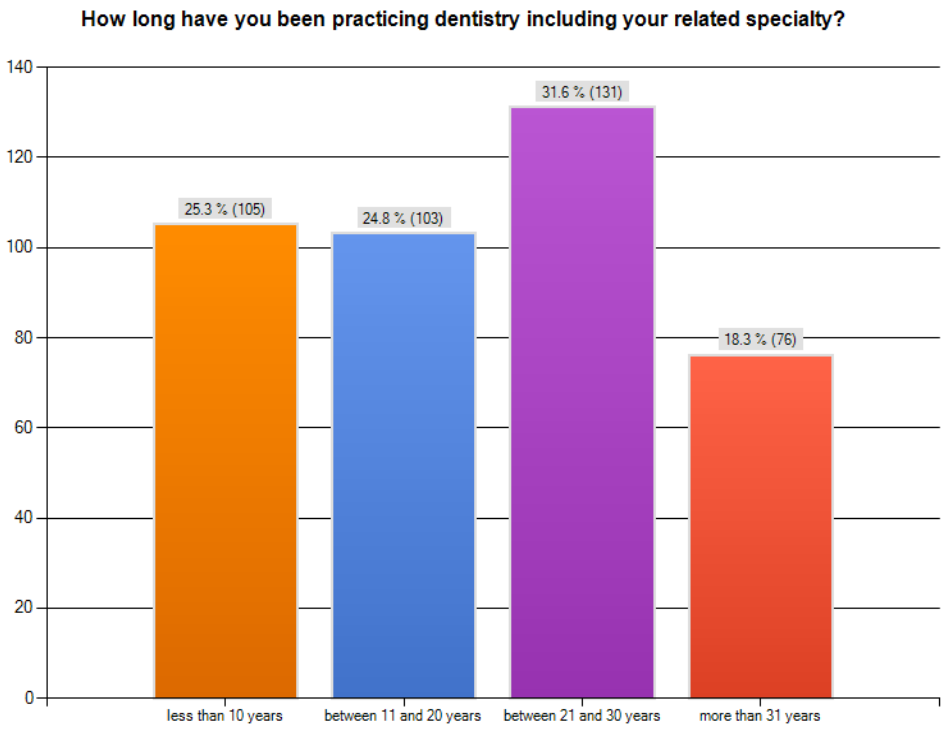

Figure 4. Professional Age.

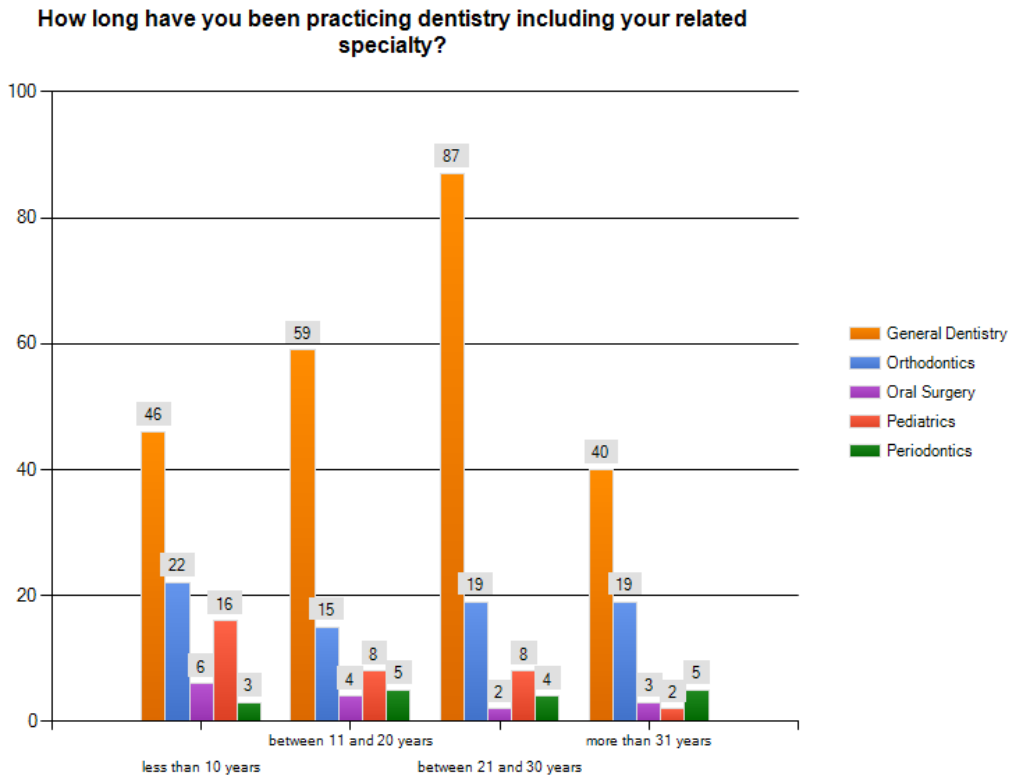

Figure 5. Professional Age by Specialty.

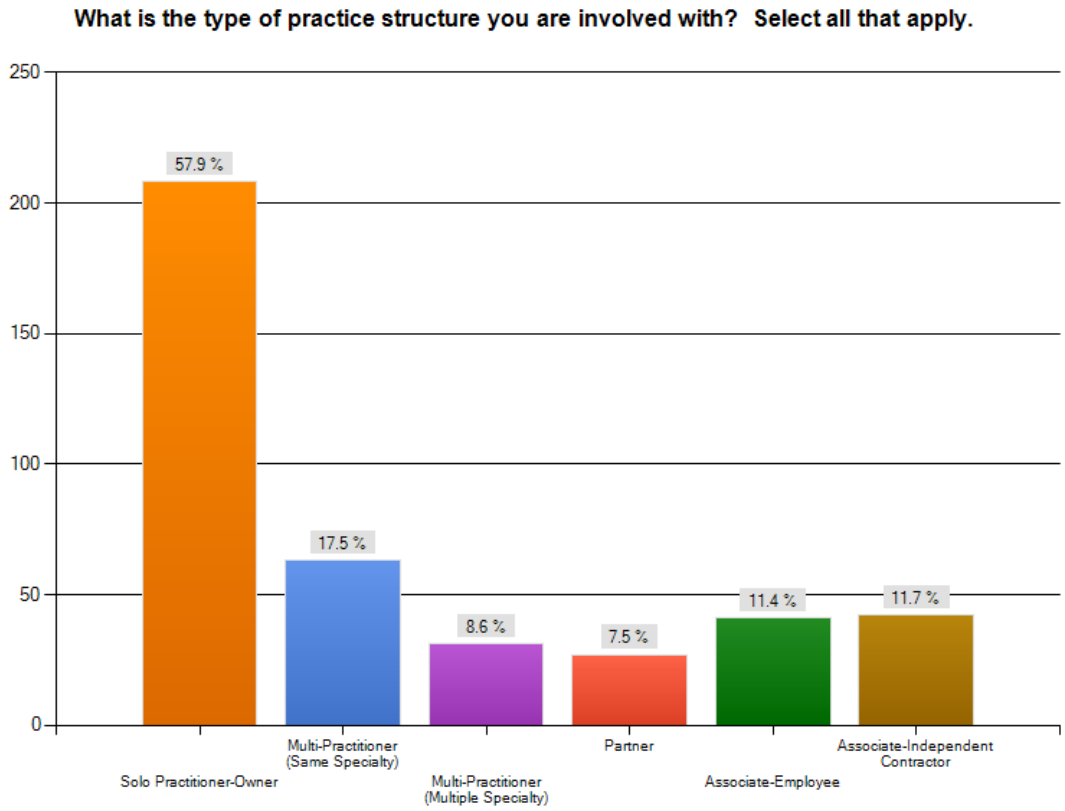

Figure 6. Practice Model.

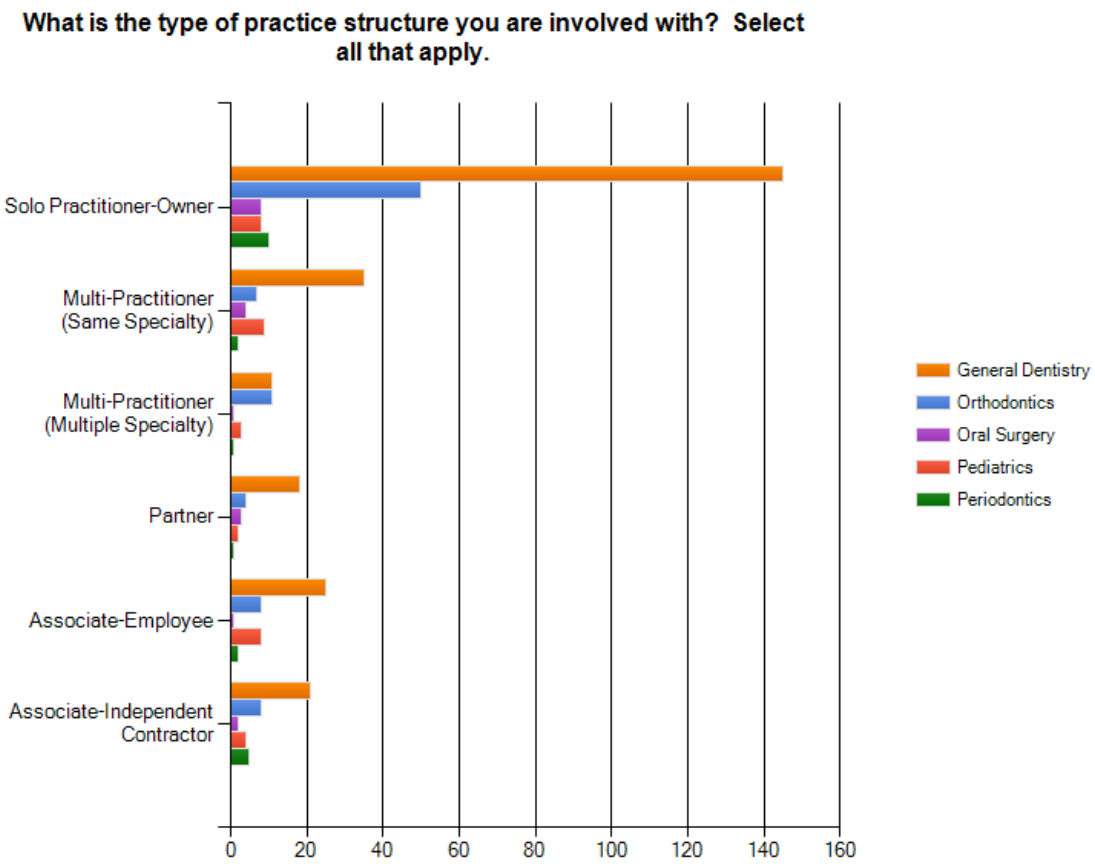

Figure 7. Practice Model by Specialty.

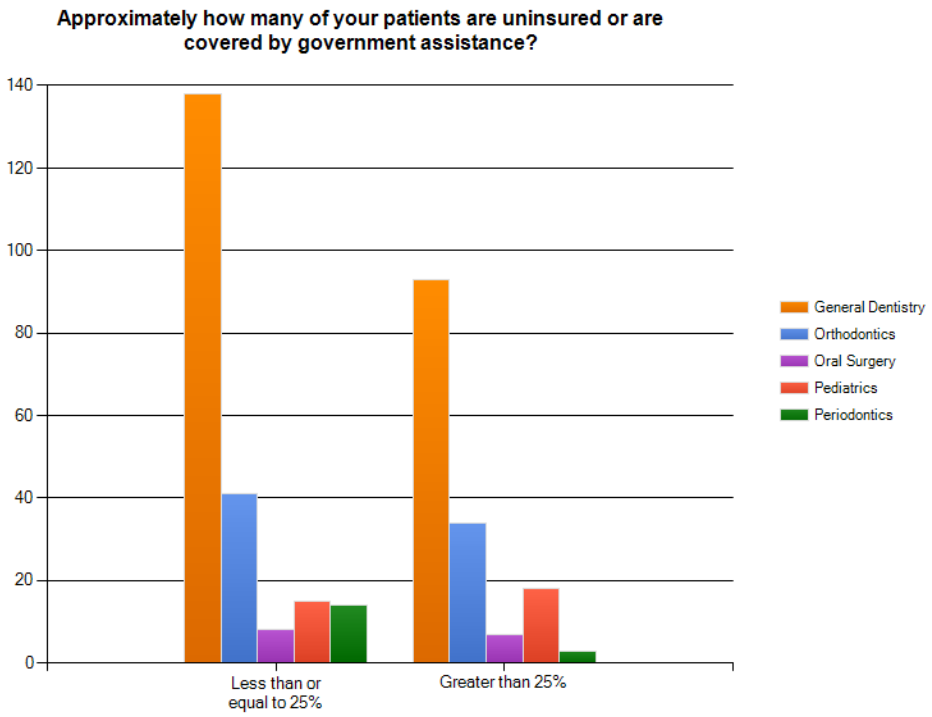

Figure 8. Percentage of Patients in the Dentist's Practice Who are Uninsured or on Government Insurance.

Importance of Civic Roles

Overall, 95% of respondents rated community participation (95%), political involvement (local-95%, state-94.5% and national-92%), and collective advocacy (97%) as somewhat or very important. Similarly, 95% of US Physicians polled by Gruen et al.[1] rated community participation as important, 92% rated political involvement as important, and 97% rated collective advocacy as important (i.e., somewhat or very important). Considering responses by specialty, 71% of general practitioners, 83% of orthodontists and 97% of pediatric dentists ranked community participation as important. Ratings of other specialties on this dimension were lower (Tables 7, 8, and 9).

Table 7. Importance Rating of Public Roles—Community Involvement by Specialty.

How important is it for dentists and dental specialists to provide volunteer health-related expertise to local community organizations?							
	Please select your current area of practice in the field of dentistry						
Answer Options	**General Dentistry**	**Ortho**	**Oral Surgery**	**Peds**	**Perio**	**Rating Average**	**Response Count**
Very Important	126	40	7	25	7		
Somewhat Important	87	24	6	8	6		
Not Very Important	10	4	2	1	3		
Not Important At All	0	1	0	0	0		
	1.48	1.51	1.67	1.29	1.75	1.49	**357**
Answered question							**357**
Skipped question							**21**

Table 8. Importance Rating of Public Roles—Political Involvement by Specialty.

How important is it for dentists and dental specialists to be politically active (other than voting) in health-related matters at the local, state or national level?						
	Please select your current area of practice in the field of dentistry					
Answer Options	**General Dentistry**	**Ortho**	**Oral Surgery**	**Peds**	**Perio**	**Response Count**
Local Level						
Very Important	105	30	7	25	4	
Somewhat Important	105	36	8	7	9	
Not Very Important	11	5	0	1	2	
Not Important At All	0	0	0	0	0	
						355
State Level						
Very Important	90	30	6	21	4	
Somewhat Important	113	34	9	11	7	
Not Very Important	11	3	0	1	2	
Not Important At All	0	0	0	0	0	
						342
National Level						
Very Important	88	25	6	19	3	
Somewhat Important	106	37	9	12	7	
Not Very Important	20	4	0	1	2	
Not Important At All	0	1	0	0	0	
						340
Answered question						**357**
Skipped question						**21**

Table 9. Importance Rating of Public Roles—Collective Advocacy by Specialty.

How important is it for dentists and dental specialists to encourage dental organizations to advocate for the public's health?						
Answer Options	**Please select your current area of practice in the field of dentistry (%)**					**Response Count**
	General Dentistry	**Ortho**	**Oral Surgery**	**Peds**	**Perio**	
Very Important	141 (63.5)	50 (70)	6 (40)	27 (79)	7 (47)	
Somewhat Important	73 (33)	19 (27)	9 (60)	7 (21)	6 (40)	
Not Very Important	8 (4)	1 (1)	0	0	2 (13)	
Not Important At All	0	1 (1)	0	0	0	
Answered question						**357**
Skipped question						**21**

Regarding the highest category on the Likert scale (Table 10), community participation was rated as "very important" by 58% of respondents (cf., 52% of US physicians).[1] Political involvement at the local level was thought to be "very important" by 48%, at the state level by 44%, and at the national level by 42% (39% of US physicians--without regard for level).[1] Collective advocacy was selected as "very important" by 65% of LLU dental respondents (cf., 62% of US physicians[1]).

Table 10. Overall Ranking of Importance For Topics of Civic-Mindedness.

Civic-Mindedness Topics	**Very Important**	**Somewhat Important**	**Not Very Important**	**Not at All Important**	**Total**	**Skipped**
Comm. Participation	58% (230)	37% (147)	5% (20)	.3% (1)	398	26
Pol. Inv.-Local	48% (191)	46% (183)	5% (21)	0	395	29
Pol. Inv.-State	44% (168)	50% (190)	5.5% (21)	0	379	45
Pol. Inv.-National	42% (159)	49.5%(187)	8% (31)	0	378	46
Col. Advocacy	65% (258)	32% (127)	3% (12)	.3% (1)	398	26

In accordance with the *Public Roles of US Physicians* study,[1] a "civic-mindedness" score was calculated for each respondent from points corresponding to their ratings. Using this method, 74.5% (278 of 373 responding) of the respondents were defined as civic-minded (total score 10 or more out of 12). In comparison, Gruen et al.[1] found that 70% of US physicians were civic-minded.

Logistic regression analysis revealed the following demographic factors were related to civic-mindedness: female gender, pediatric specialty and orthodontic specialty. No other factors were considered significant for predicting civic-mindedness. By comparison, the US physician study found female gender, increasing professional age and under-represented minority status were related to civic-mindedness.[1]

Table 11. Civic-Mindedness Model.

Model	**Unstandardized Coeff.**		**Standardized Coeff.**	**Sig.**	**95% Confidence Interval**	
	B	Std. Error	Wald		Lower Bound	Upper Bound
(Constant)	-1.690	1.229	1.891	0.169		
Female	2.994	1.256	5.682	0.017	1.703	234.040
Caucasian	0.416	0.275	2.280	0.131	.0.883	2.601
Ortho	0.682	0.454	2.259	0.133	0.813	4.816
Pediatrics	1.381	0.712	3.762	0.052	0.986	16.050
Collective Advocacy	1.690	0.311	11.780	0.001	1.580	5.339

Civic Activities

Of LLU dental graduates, 91% participated in at least one of the three categories of civic activity compared to 65% of US physicians.[1] Overall 73% of respondents reported providing volunteer health-related expertise in their local communities while 24% reported being politically active and 34% encouraged a professional society to address a public health or policy issue during the last three years. Comparatively, the *Public Roles of US Physicians* study[1] found 54% of respondents provided volunteer health-related expertise, 26% reported being politically active, and 24% encouraged a professional society to address a public health or policy issue during the last three years.

The raw data revealed that Caucasian respondents reported more volunteer activity (75%) than either Asians (67%) or the underrepresented minorities (64.5% of African-American, Hispanic, and Other combined). Caucasians and underrepresented minorities, however, demonstrated twice the level of activity in political involvement relative to Asians (27% and 26% vs. 13%). Collective advocacy was the highest among underrepresented minorities at 42%, followed by Caucasians at 36% and then Asians at 26%.

Older US physicians (those of greater professional age) were significantly less active in community volunteer organizations but more active in collective advocacy through the professional societies.[1] Unlike the US physicians, LLU dentists showed no noticeable difference in the raw data for either civic attitudes or activity based on professional age.

US physicians with higher numbers of uninsured or government assistance patients were significantly more likely to be active in collective advocacy but no more

likely to participate in community volunteerism.[1] LLU dentists, regardless of amount of insured or uninsured patients, showed no substantial difference in either attitude or activity. Similar to the US physician study,[1] the number of hours worked was unrelated to levels of activity in any of the three dimensions.

Compared with other dental specialties, oral surgeons reported the highest percentage of respondents who volunteered health expertise in the community (93%, n=19). From the most to the least, the order of remaining specialties who reported having volunteered at least once during the last three years were: pediatric dentists (85%, n=34), prosthodontists (78%, n=14), orthodontists (74%, n=77), general dentists (73%, n=235), endodontists (61%, n=21), and periodontists (43%, n=17). Orthodontists reported the greatest level of political activity (35%) followed by pediatric dentists (26.5%), general dentists (23%), oral surgeons (21%), prosthodontists (21%), endodontists (15%), and periodontists (0%). Finally, regarding reported collective advocacy, prosthodontists topped the list of specialties (57%), followed by orthodontists (45%), pediatric dentists (41%), general dentists (32%), oral surgeons (27%), endodontists (14%) and periodontists (12.5%).

Logistic regression analysis revealed the following factors were related to civic action: civic-mindedness, pediatric specialty, and professional age greater than 20 years. The US physician study found civic-mindedness, rural practice location, under-represented minority status, and pediatric and family practice were considered significant for predicting civic action.[1] No other variable had significant association with civic activity for either study.

Table 12. Civic Action Model.

Model	Unstandardized Coeff.		Standardized Coeff.	Sig.	95% Confidence Interval	
	B	Std. Error	Wald		Lower Bound	Upper Bound
(Constant)	-1.747	0.094	3.254	0.071		
Civic-Attitude	0.305	.187	1.515	0.001	1.128	1.630
Female	-0.397	.475	0.301	0.187	0.372	1.213
Prof Age >20 yr	-0.426	.756	2.282	0.131	0.376	1.135

Thought vs. Action

Civic-minded LLU dental graduates were more likely to have been civically active in at least one of the three categories than those who were not civic-minded (80% vs. 69%); the difference between these groups was greater among the US physicians (71% vs. 53%).[1] It should be noted that, regardless of civic-mindedness, more LLU dentists than US physicians were civically active. Civic-minded LLU dental graduate males were more likely to be civically active than civic-minded females (82% vs. 73.5%). Males and females who were not considered civic-minded were similar in their civic action (68% vs. 67%).

Of those classified civic-minded, 76% participated in volunteer health-related tasks while 65% of the not civic-minded also participated in volunteer health-related tasks. Only 29% of the civic-minded and 13% of the not civic-minded groups reported being politically active during the past three years. Similarly, 38.5% of civic-minded and

18% of not civic-minded advocated for a public dental or health policy at least once during the past three years.

Of respondents who rated volunteering health expertise as being "very important," 28% actually reported activity in their local community during the past three years. Thirty-nine percent who rated political involvement concerning a local health issue as "very important" reported political activity within the past three years. Regarding collective advocacy, 42% of those who reported it as "very important" had participated in collective advocacy at the local level at least once during the past three years.

Public Advocacy Topics

Concerning access-to-care issues, over half (55%) of the LLU dental respondents rated health insurance as "very important," not unlike the US physicians (58%).[1] Meanwhile, a minority (12%) of LLU respondents thought increasing the number of graduating dentists was "very important." Regarding more direct influences, reducing obesity and controlling tobacco were each rated as very important by over 70% of LLU respondents. Over half (58%) of LLU dentists considered water fluoridation as very important.

The broader socioeconomic influences of increased literacy and reduced unemployment were deemed to be "very important" by 78% and 71% of LLU respondents, respectively, while reducing air pollution was considered "very important" by 56%. See Figure 9 for specific advocacy results from both this study. Dental graduates from LLU did rate the broader socioeconomic influences, air pollution, literacy and unemployment higher than US physicians.[1]

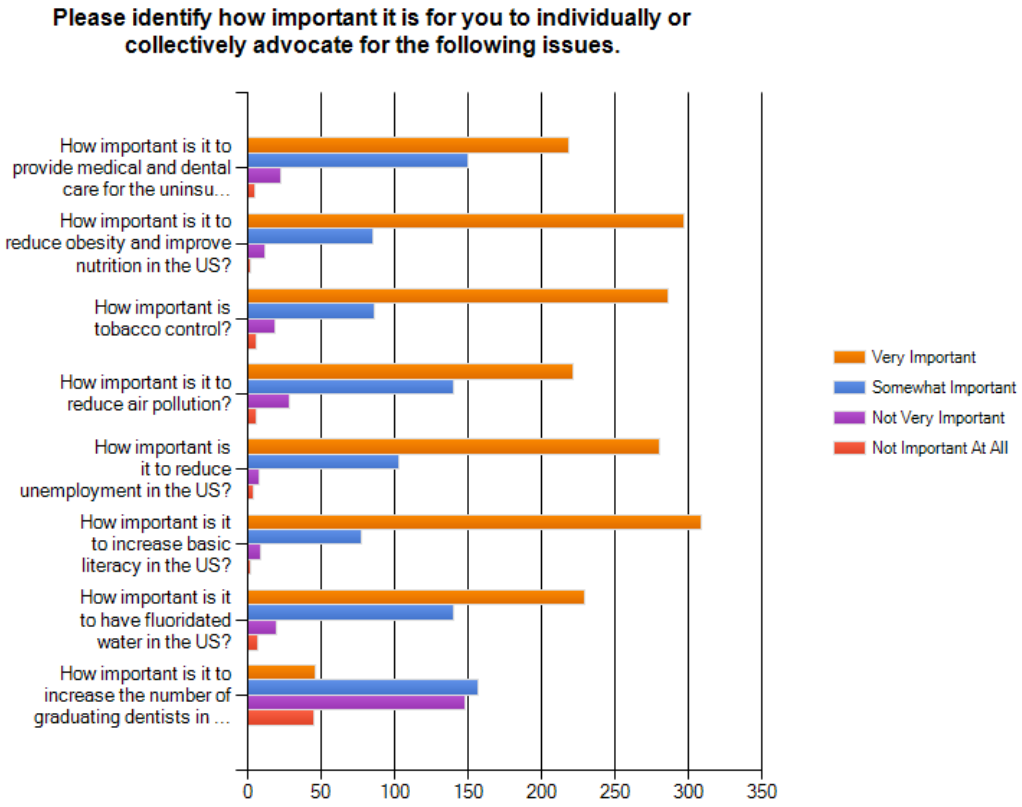

Figure 9. Rating of Importance—Topics for Advocacy.

CHAPTER FOUR

DISCUSSION

According to its purpose, this study began to explore social connectedness, specifically the civic attitudes and actions, of LLU-trained dentists, orthodontists and other dental specialists. In so doing, this project determined the importance these professionals placed on public roles, their participation in related activities and the personal, professional, and practice variables related to their responses. Implications of these results for the profession and future research will be addressed in the ensuing discussion.

Response Rates

The overall response rate of 41% provided sufficient data for analysis purposes yet was lower than the US physician survey[1] response rate of 58%. Methodological differences between these studies may account for some of this disparity. First, the current survey was web-based, whereas the US physician study[1] was mail-based and included follow-up telephone calls to non-respondents. Additionally, the LLU dental survey was conducted over the course of one month while the US physician survey[1] was carried out over eight months. Given the subject matter and the relationship of the survey group as fellow alumni to the researcher, the response rate though adequate was lower than might be expected and, in and of itself, raises questions about the connectedness and mindset of the subject pool. Are individuals who fail to respond to surveys less civic-

oriented than those who do? At minimum, the silent majority is expressing a lack of concern and/or time for this topic.

Response rates for this survey varied appreciably across specialty groups; LLU general dentists and dental anesthesiologists achieved the lowest rates among the specialty categories (29.5% and 23%, respectively). Pediatric dentists had the highest response rate at 100% and, as it turned out, were more likely to be civic-minded and civically active. Orthodontists also had a high response rate and were more likely to be civic-minded though no more likely to be civically active than any of the other groups. Of interest, the author is a pediatric dentist and an orthodontic resident. This reality may have contributed to a higher response rate from these two specialties due to professional association and a sense of obligation among the respondents.

Even though the LLU study had a respectable response rate overall, a number of respondents did not answer all of the questions. By design, this researcher sought to reduce the number of abandoned surveys by including only one question that required an answer to progress in the survey (i.e., whether the dentist was in active practice or not). All other questions allowed the respondent to move on to the next question regardless of his/her response or lack thereof. One unfortunate byproduct of this strategy was that respondents left some questions unanswered. The most frequently skipped questions were those that requested the respondent to list the most recent incidence of civic action in each dimension of civic involvement in the past three years. Although it is possible that some questions regarding opinions and attitudes elicited an inflammatory reaction, even basic demographic questions were skipped. Fortunately for this study, the skipped

questions did not adversely affect the analyses; the number of participants and answered questions rendered sufficient power for evaluation purposes.

Civic Attitudes and Actions

Loma Linda University dental graduates indicated that civic roles, as operationally defined by community participation, political involvement and collective advocacy, were important (95% of respondents). These attitudes were similar to that found among US physicians[1] (92-97% of respondents). While civic-mindedness in both groups was highly related to civic action (80% of civic-minded LLU dental grads were civically active vs. 72% of US physicians, see Table 13), there were a high number of those not identified as civic-minded who also demonstrated civic action (69% of LLU dental grads and 53% of US physicians[1]).

Table 13. Comparison Between US Physicians[1] and LLU Dental Graduates.

	US Physicians	LLU Dental Graduates	Confidence Interval for LLUDGs (CI=95%)
Rated Community Participation, Political Involvement, Collective Advocacy as Important	95%	95%	92-97%
Rated Community Participation as Very Important	52%	58%	53-63%
Rated Local Political Involvement as Very Important	37%	48%	43-53%
Rated Collective Advocacy as Very Important	62%	65%	60-69%
% Considered Civic-Minded	70%	74.5%	70-79%
% of Civic-Minded Who Were Active in at Least One Civic Activity During the Past Three Years	71%	80%	76-83%
% of All Who Were Active in at Least One Civic Activity During the Past Three Years	65%	91%	88-93%
Volunteered Local Health Expertise at Least Once During the Past Three Years	54%	73%	68-77%
Politically Active at Least Once During the Past Three Years	26%	24%	20-28%
Encouraged Local Professional Society to Address a Public Health Policy at Least Once During the Past Three Years	24%	34%	30-39%

Following this discovery, the data were revisited to see if a large number of respondents just missed the "civic-mindedness" designation. While 74.5% of the LLU dental respondents scored 10 or more on the civic attitude scale, 23% scored between 8 and 10 with none lower than 6. The former were labeled civic-minded according to Gruen et al.'s[1] operational definition; the latter were not. These data would suggest the non-civic-minded are not against civic involvement but are rather more moderate in their support. This certainly helps account for the substantial civic activity noted in this subgroup.

Also of importance here, respondents were considered civically active if they had participated in one or more civic activities within the past three years. Perhaps these parameters were too generous to assess civic action. If so, then redefining civic action would be important for further studies and may reveal a different outcome. Indeed, reversing the decline in public trust and increasing access to care may require much more involvement from dentists than these currently-employed definitions of civic attitude and action allow.

Although lukewarm civic attitudes may be sufficient for spawning civic activity, another possible explanation exists, one that relates to motives and personality. Clearly, motives other than concern for social good, that is, motives such as recognition, popularity, power and financial gain, can drive civic activity. A 2003 personality and profession study by Hardigan and Cohen, using the Meyers-Briggs analysis, found the predominant personality of dentists to be ESTJ, "meaning they are practical, realistic with a natural head for business or mechanics."[70] Taking this line of questioning one step further, is there a personality type that is likely to be more professional and is it identifiable? Research on this topic suggests that there might be. For instance, research using the NEO Five-Factor Inventory[71] has indicated that two measured traits, Conscientiousness and Neuroticism, were significant predictors of dental school performance and professional behavior.[72]

Topics for Public Advocacy

This study found 55% of LLU dentists thought medical and dental insurance for the uninsured was a very important issue (cf., 58% of US physicians;[1] see Table 14).

Given evidence that a lack of dental insurance contributes to an access-to-care problem in the US, perhaps the remaining dentists polled do not perceive access-to-care as a problem or the role that insurance plays in getting dental care.

The LLU respondents thought that adding more dentists to the workforce was not very important (11%). Health topics more directly impacting the individual patient, such as obesity and tobacco, elicited similar responses to the physician group. Broader issues likely to affect a patient's well-being appeared to concern LLU dentists more than US physicians.[1] For example, reducing unemployment and increasing literacy were "very important" to 71% and 78%, respectively, of LLU respondents versus 23% and 42% of US physicians.[1]

Table 14. Attitudes Concerning Topics for Advocacy--Comparison Between LLU Dental Graduates and US Physicians.[1]

Issues for Advocacy	LLU Dentists (% rating as very important)	LLUDGs Confidence Interval (95% CI)	US Physicians (% rating as very important)[1]
Access to Care			
Health insurance	55.1	50-60	58.1
Number of new DDS grads	11.6	9-15	n/a
Direct Socioeconomic Influences			
Reduced obesity	75.0	70-79	81.9
Water fluoridation	57.8	53-63	n/a
Tobacco Control	72.0	67-76	76.9
Broad Socioeconomic Influences			
Reduced air pollution	55.9	51-60)	42.7
Increased literacy	77.8	73-82	41.6
Reduced unemployment	70.9	66-75	22.6

A number of explanations for this finding are plausible. First, it is possible that dentists are more attune to the market economy and the influence these factors have on

treatment seeking and acceptance. Alternatively, the dental respondents may better reflect public opinion for reasons unassociated with financial motivators. Dental education may also be a factor in that it might emphasize a broader perspective of health, one that of necessity encompasses dental concerns and therefore more readily considers factors affecting the whole person. In addition, the US physician study[1] used data collected in 2003. The national environment was different then as unemployment was lower and the recession had not begun. Given these changes, the dentists may reflect more closely the concerns held by the general public today. If the US physicians were queried at the present time, their responses might be more similar to the LLU dentists. Finally, cognitive interference may have played a role in this part of the survey. Though the respondents were instructed at the top of the page to rate the importance of advocating for the issues that followed, the wording of specific questions about the importance of each topic could have interfered with their understanding of the task (see Table 2 or Appendix A). If this occurred, the respondent might have rated overall importance of the topic to society rather than the importance of personally or collectively advocating for each issue. Confusion of this nature could possibly result in higher ratings of importance.

Of particular interest was the response by LLU dentists to the fluoridation question. Only 58% of dentists thought fluoridation was important for their patients. This demonstrates the lack of consensus arising within dentistry on this issue. Lately, this topic has been mired in political controversy while a plethora of scientific support has had little effect on the general population and apparently on many of the dentists who serve them.

Future Research

This study suggests that LLU dentists believe they have oral-health and other health-related responsibilities that extend into their communities, beyond the scope of their individual practices. The LLU respondents also appeared to be quite civic-minded and active by the definitions used. Gruen et al. discovered a similar pattern, though not as strong as our findings, among US Physicians.[1] Whether the LLU respondents are highly socially conscious or connected is open to speculation. While it is heartening that many LLU respondents demonstrate both civic-mindedness and civic action, it is not clear that the observed pattern is enough to tip the balance and reverse the trends for public trust or access-to-care.

With this in mind, further research should initially seek to learn more about the following questions: Are these findings consistent with a broader sampling of dentists, e.g., all California dental school graduates? What would the results look like if the definition of civic action were tightened? What can be discovered about the dentists who do not respond to surveys? Additional research should also address these related lines of inquiry: What drives civic activity in those not identified as civic-minded? Is civic activity a modifiable variable? Is increased civic activity a result of training? Is it personality based?

CHAPTER FIVE

CONCLUSIONS

1. The vast majority of LLU dental respondents (95%) considered the public roles of dentists, i.e., community participation, political involvement, and collective advocacy, to be important.
2. The majority of respondents reported volunteering dental or health-related expertise to a local community organization (73%). Less than a quarter were politically active while slightly more than a third of all respondents had encouraged or been involved in their local professional society in addressing a public dental or health policy issue at least once during the past three years.
3. The respondents surveyed demonstrated similar responses to that of physicians polled in a previous study by Gruen et al.[1] Both groups demonstrated similar levels of civic-mindedness (95% considered public roles to be important and > 50% considered community participation to be very important). There were notable differences, however. Two-thirds of LLU dentists regarded collective advocacy as very important as opposed to only half of US physicians.[1] Almost half of LLU dentists thought political involvement was very important compared to one-third of US physicians.[1] In addition, a higher level of civic activity was reported by the LLU dentists than the US physicians[1] (91% vs. 65%).

4. The majority of LLU respondents deemed broader health concerns not obviously tied to the oral health of dental patients as important. The percentages were considerably higher than that obtained in the study of US physicians.[1]

On the surface the majority of the LLU dental respondents appear civic-minded and particularly civically active, regardless of civic orientation. Is this sufficient to affect a change within dental professionalism?

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APPENDIX A

SURVEY QUESTIONNAIRE.

Public Roles of LLU Dentists

1. Welcome and thank you in advance for your participation.

Thank you for taking time out of your busy schedule to answer a few questions related to dentistry. Your participation is completely voluntary and all of your answers will remain anonymous.

Your willingness to complete this survey is integral to the success of a master's project of a fellow colleague and alumnus.

This survey should take you between 10-15 minutes.

2. Demographics

1. Are you currently practicing in the field of dentistry or a related specialty?

- ◯ Yes
- ◯ No

3.

1. What is your gender?

- ◯ Male
- ◯ Female

2. What is your ethnicity?

- ☐ Caucasian
- ☐ Asian
- ☐ African-American
- ☐ Hispanic
- ☐ Native American
- ☐ Other

3. What is the ZIP code of your primary place of practice? (The purpose of this question is to allow us to analyze geographical trends.)

ZIP:

Public Roles of LLU Dentists

4. Where did you receive your dental and/or specialty training? You may select more than one answer if necessary.

- ☐ U.S.A./Canada
- ☐ Europe
- ☐ Asia
- ☐ Other

5. Please select your current area of practice in the field of dentistry.

- ◯ General Dentistry
- ◯ Anesthesiology
- ◯ Endodontics
- ◯ Orthodontics
- ◯ Oral Surgery
- ◯ Pediatrics
- ◯ Periodontics
- ◯ Prosthodontics
- ◯ Oral Pathology

4.

1. How long have you been practicing dentistry including your related specialty?

- ◯ less than 10 years
- ◯ between 11 and 20 years
- ◯ between 21 and 30 years
- ◯ more than 31 years

2. How many hours per week do you spend providing direct patient care?

- ◯ On average 32 or less hours per week
- ◯ On average more than 32 hours per week

3. How many locations do you practice at?

- ◯ One
- ◯ Two
- ◯ Three or more

Public Roles of LLU Dentists

4. What is the type of practice structure you are involved with? Select all that apply.

- ☐ Solo Practitioner-Owner
- ☐ Multi-Practitioner (Same Specialty)
- ☐ Multi-Practitioner (Multiple Specialty)
- ☐ Partner
- ☐ Associate-Employee
- ☐ Associate-Independent Contractor

5. Approximately how many of your patients are uninsured or are covered by government assistance?

- ◯ Less than or equal to 25%
- ◯ Greater than 25%

5. Civic Involvement

1. In the past 3 years have you provided volunteer dental or health-related expertise to any local community organizations?

- ◯ Yes
- ◯ No

6. Civic Involvement

1. In the past 3 years have you been politically active (other than voting) on a local dental or health care issue?

- ◯ Yes
- ◯ No

7. Civic Involvement

1. In the past 3 years have you encouraged or been involved with your local professional society in addressing a public dental or health policy issue?

- ◯ Yes
- ◯ No

8. Civic Involvement

Public Roles of LLU Dentists

1. Please list your most recent volunteer contribution of dental- or health-related expertise to your local community.

9. Civic Involvement

1. Please list the dental or health issue for which you have most recently been politically active.

10. Civic Involvement

1. Please list an instance of how you have encouraged your professional society's effort in addressing a public dental or health policy issue.

11. Civic Involvement

1. How important is it for dentists and dental specialists to provide volunteer health-related expertise to local community organizations?

	Very Important	Somewhat Important	Not Very Important	Not Important At All
Importance of Volunteering Dental Expertise	○	○	○	○

2. How Important is it for dentists and dental specialists to be politically active (other than voting) in health-related matters at the local, state or national level?

	Very Important	Somewhat Important	Not Very Important	Not Important At All
Local Level	○	○	○	○
State Level	○	○	○	○
National Level	○	○	○	○

3. How important is it for dentists and dental specialists to encourage dental organizations to advocate for the public's health?

	Very Important	Somewhat Important	Not Very Important	Not Important At All
Encourage dental organizations	○	○	○	○

12. Issues for Advocacy

Public Roles of LLU Dentists

1. Please identify how important it is for you to individually or collectively advocate for the following issues.

	Very Important	Somewhat Important	Not Very Important	Not Important At All
How important is it to provide medical and dental care for the uninsured?	○	○	○	○
How important is it to reduce obesity and improve nutrition in the US?	○	○	○	○
How important is tobacco control?	○	○	○	○
How important is it to reduce air pollution?	○	○	○	○
How important is it to reduce unemployment in the US?	○	○	○	○
How important is it to increase basic literacy in the US?	○	○	○	○
How important is it to have fluoridated water in the US?	○	○	○	○
How important is it to increase the number of graduating dentists in the US?	○	○	○	○

13. Thank you for your participation.

We appreciate your willingness to take this survey. Your time and opinions are valuable and much appreciated.

Thank you.

APPENDIX B

LLU DENTAL GRADUATE RESPONSE CHARACTERISTICS

		Community Participation 398	*413*	*Political Involvement (Local) 395*	*408*	*Political Involvement (State) 380*	*Political Involvement (National) 378*	*Collective Advocacy 398*	*411*
	Responses No. (%)	**Rated as Important**	**Activity in Past 3 yrs**	**Rated as Important**	**Activity in Past 3 yrs**	**Rated as Important**	**Rated as Important**	**Rated as Important**	**Activity in Past 3 yrs**
Overall	451 (100%)	377 (94.7%)	300 (72.6)	374 (94.7)	98 (24.0)	359 (94.5)	346 (91.6)	385 (96.7)	140 (34.1)
Non Practicing	27 (6%)								
Gender	416								
Men	326 (78.4%)	286 (87.7)†	238 (73)	285 (87.4)	84 (25.8)	276 (84.7)	265 (81.3)	293 (89.9)	114 (35)
Women	90 (21.5%)	87 (96.7)	58 (64.4)	85 (94.4)	14 (15.6)	80 (88.9)	79 (87.8)	26 (28.9)	26 (28.9)
Ethnicity (417)	417								
Caucasian	291 (70.1%)	261 (89.7)	215 (73.8)	261 (66.8)	76 (26.1)	248 (63.4)	244 (62.4)	269 (68.8)	101 (34.7)
Asian	94 (22.7%)	82 (87.2)	62 (66)	79 (84)	12 (12.8)	79 (84)	73 (77.7)	83 (88.3)	24 (25.5)
African American	2 (.5%)	2 (100)	2 (100)	2 (100)	0 (0)	2 (100)	2 (100)	2 (100)	0 (0)
Hispanic	15 (3.6%)	12 (80)	11 (73.3)	15 (100)	5 (33.3)	14 (93.3)	13 (86.6)	15 (100)	7 (46.6)
Other	14 (3.4%)	12 (85.7)	7 (50)	14 (100)	3 (21.4)	12 (85.7)	11 (78.6)	13 (92.9)	6 (42.9)
Professional Age (415)	415								
<10 yrs	105 (25.3%)	96 (91.4)	81 (77.1)	97 (92.4)	24 (22.9)	97 (92.4)	92 (86.6)	99 (94.3)	40 (38.3)
11-20 yrs	103 (24.8%)	96 (93.2)	67 (65)	96 (93.2)	22 (21.4)	86 (83.5)	84 (81.6)	99 (96.1)	32 (31.1)
21-30 yrs	131 (31.6%)	119 (90.8)	97 (74)	119 (90.8)	34 (26)	117 (89.3)	113 (86.3)	124 (94.7)	42 (32.1)
>31 yrs	76 (18.3%)	65 (78.9)	54 (71.5)	61 (80.3)	18 (23.7)	57 (75)	56 (73.7)	62 (81.6)	25 (32.9)
Dental school (420)	420								
United States/Canada	418 (99.5%)	376 (90)	299 (71.5)	373 (89.2)	97 (23.2)	358 (85.6)	346 (82.8)	384 (91.9)	139 (33.3)
Other	24 (5.7%)								

Hours/ Week in direct care (415)	415								
≤32 per week	235 (56.7%)	219 (93.2)	172 (73.1)	213 (90.6)	49 (20.9)	204 (86.8)	101 (43)	220 (93.6)	73 (31.2)
>32 per week	180 (43.4%)	158 (87.8)	127 (70.6)	161 (89.4)	49 (27.2)	154 (85.5)	152 (84.4)	152 (91.7)	67 (37.2)
No. of locations of practice	413								
One	280 (67.8%)	252 (90)	200 (71.4)	248 (88.6)	63 (22.5)	232 (82.9)	226 (80.7)	256 (91.4)	96 (34.3)
Two	91 (22.0%)	89 (97.8)	69 (75.8)	86 (94.5)	24 (26.4)	84 (92.3)	78 (85.7)	87 (95.6)	30 (33)
Three or more	42 (10.2%)	36 (85.7)	29 (69)	38 (90.5)	9 (21.4)	39 (92.9)	39 (92.9)	39 (92.9)	13 (31)
Primary practice organization	414								
Solo-owner	241 (58.5%)	215 (89.2)	170 (70.5)	214 (88.8)	56 (23.2)	204 (84.6)	193 (80.1)	221 (91.7)	78 (32.4)
Multi-practitioner (same specialty)	67 (16.2%)	60 (89.6)	47 (70.1)	61 (91)	18 (26.9)	59 (88.1)	59 (88.1)	62 (92.5)	22 (32.8)
Multi-practitioner-(multiple specialty)	37 (8.9%)	34 (91.9)	9 (24.3)	33 (89.2)	14 (37.8)	32 (86.5)	32 (86.5)	35 (94.6)	14 (37.8)
Partner	32 (7.7%)	30 (93.8)	29 (90.1)	29 (90.1)	10 (31.3)	29 (90.1)	27 (84.4)	28 (87.5)	14 (43.8)
Associate-employee	48 (11.6%)	44 (91.7)	35 (72.9)	44 (91.7)	10 (20.8)	43 (89.6)	42 (87.5)	45 (93.8)	13 (27.8)
Associate-contractor	47 (11.4%)	43 (91.5)	28 (59.6)	46 (97.9)	7 (14.9)	44 (93.6)	44 (93.6)	46 (97.9)	12 (25.5)
# of pt.s uninsured &/or are on govt ins.	412								
≤25%	242 (58.7%)	219 (90.5)	169 (69.8)	217 (89.7)	53 (21.9)	200 (82.6)	192 (79.3)	220 (90.9)	81 (33.5)
>25%	170 (41.3%)	154 (90.6)	127 (74.7)	153 (90)	43 (25.3)	155 (91.2)	150 (88.2)	161 (94.7)	57 (33.5)

Specialty (419)	419								
General Dentistry	235 (56.1%)	167 (71.1)	213 (90.6)	210 (89.4)	53 (22.6)	203 (86.4)	194 (82.6)	214 (91.1)	73 (31.1)
Anesthesia	5 (1.2%)	5 (100)	3 (60)	5 (100)	1 (20)	4 (80)	5 (100)	5 (100)	1 (20)
Endodontics	21 (5%)	20 (95.2)	13 (61.9)	18 (85.7)	3 (14.3)	17 (81)	17 (81)	19 (90.5)	3 (14.3)
Orthodontics	77 (18.4%)	64 (83.1)	55 (71.4)	66 (85.7)	26 (33.8)	64 (83.1)	62 (80.5)	69 (89.6)	34 (44.2)
Oral Surgery	15 (3.6%)	13 (86.7)	14 (93.3)	15 (100)	3 (20)	15 (100)	15 (100)	15 (100)	4 (26.7)
Pediatrics	34 (8.4%)	33 (97.1)	29 (82.9)	32 (94.1)	9 (26.5)	32 (94.1)	31 (91.2)	34 (100)	14 (41.2)
Periodontics	17 (4.1%)	13 (76.5)	7 (41.2)	13 (76.5)	0 (0)	11 (64.7)	10 (58.8)	13 (76.5)	2 (11.8)
Prosthodontics	14 (3.3%)	14 (100)	11 (78.6)	14 (100)	3 (21.4)	11 (78.6)	11 (78.6)	14 (100)	8 (57.1)