

## Characteristics of Dental Hygienists based on Holland's Career Choice Theory

Angela L Monson, RDH, PhD

### Introduction

Multiple barriers, such as lack of awareness and adequate assessment instruments, are preventing students from considering dental hygiene as a career choice alternative. Effective recruitment strategies are critical to attract qualified applicants and meet the oral health care needs of the nation. Few studies have been published that examine predictors of career choice for dental hygienists, and even fewer are based on career theory. Prior to conducting theory driven career choice research in dental hygiene, characteristics based on theory constructs of satisfied dental hygienists in various career tracks within dental hygiene need further description. Results of this research can then be utilized to develop improved career assessment instruments and examine career choices of dental hygiene students.

Building from counselor experience and the vocational literature, Holland first constructed the Vocational Preference Inventory in 1958, examining preferences for occupations of 300 college freshmen based on personality traits.<sup>1</sup> This inventory was later validated when compared to the 16 personality factor questionnaire for 763 boys and 394 girls.<sup>2</sup> While this inventory focused on characteristics of the individual, Holland went on to describe environments by examining the distribution of people within the environment. Astin and Holland developed the Environmental Assessment Technique by examining correlations between institutional size, intelligence level and 6 personality characteristics for students who completed the College Characteristics Index at 36 institutions.<sup>3</sup> This assessment technique suggests that environments are dependent or influenced by the typical characteristics of its members.

In 1971, Holland developed a self-scored interest survey (Self-Directed Search) to determine place-

### Abstract

**Purpose:** The purpose of this study was to survey 1,800 current licensed dental hygienists in the U.S. and identify broad and basic interest patterns within Holland's 6 General Occupational Themes.

**Methods:** A national stratified random sample of 1,800 members of the American Dental Hygienists' Association was surveyed. Paper and online surveys included the Strong Interest Inventory and the Skills Confidence Inventory. Descriptive statistics and independent t-tests were used to analyze the data.

**Results:** A total of 928 participants (51.9%) completed and returned the paper survey, while 436 participants (24.4%) also completed the online surveys. Results support coding the dental hygiene profession as Investigative – Social – Realistic using the General Occupational Themes. Dental hygienists had the most significant mean differences in the Healthcare Services, Medical Science and Science Basic Interest Scales as compared to the General Representative Sample.

**Conclusion:** Holland's 6 General Occupational Themes have the potential to help guide student choice regarding dental hygiene as a career.

**Keywords:** Dental hygienist, career assessment, Holland's General Occupational Themes, career theory

This study supports the NDHRA priority area, **Professional Education and Development:** Validate and test measures that evaluate student critical thinking and decision-making skills.

ment within 6 personality types, including realistic, investigative, artistic, social, enterprising and conventional.<sup>4</sup> In 1975, the Self-Directed Search was validated when compared to the Kuder Preference Record, the Thurstone Temperament Schedule, the Bennett Mechanical Comprehension Test and the Minnesota Paper Form Board using a sample of 158 high school students.<sup>5</sup> Holland's theory relies on the premise that when personality type matches the environment, the person will experience job satisfaction, career stability and work achievement.<sup>1,6</sup>

Holland described the 6 types of personality and the matching 6 environments.<sup>1</sup> The realistic type possesses traditional values within a closed system of beliefs. This person perceives oneself as mechanical, technical and athletic, and may be described as conforming, inflexible, practical, reserved and persis-

tent. The investigative type holds scientific and scholarly values above other life values, and perceives oneself as analytical and curious with broad interests and may be described as complex, critical, independent, intellectual, pessimistic and unassuming. The artistic type values self-expression and equality for all, and perceives oneself as artistic and musically able, and may be described as emotional, expressive, idealistic, imaginative, intuitive and sensitive. The social type values religion, helpfulness and forgiveness, and perceives oneself as understanding, with a lack of scientific ability and may be described as cooperative, friendly, generous, patient, responsible and warm. The enterprising type values economic and political achievement, and perceives oneself as aggressive, popular and self-confident and may be described as adventurous, assertive, extroverted, forceful and sociable. The conventional type values business and economic achievement with traditional conservatism, and perceives oneself as conforming and orderly with little skills in the arts and may be described as careful, dogmatic, efficient, methodical, practical and thorough. Since the characteristics of the environment reflect the typical characteristics of the members, the 6 environment types are parallel to the personality types.

In 1980, Holland developed an instrument to measure vocational identity, the need for occupational information and personal or environmental barriers based on a sample of 496 high school sophomores.<sup>7</sup> "A person with a clear sense of identity is more likely to accept or find work that is congruent with his or her personal characteristics and to persist in his or her search for a congruent work environment."<sup>6</sup> The vocational identity, occupational information and barriers scales were validated with 824 high school and college students and workers.<sup>7</sup>

Strengths of Holland's typology of personality-environment include:

1. Understandable
2. Clear definitions with internally consistent structure
3. Research supported with various samples including children, adolescents, college students and adults
4. Easy to implement in practice<sup>8</sup>

The Self-Directed Search opens career exploration directly to individuals through the use of computers and internet without dependency on a career counselor.

Holland recognizes that his theory lacks inclusion of cognitive constructs, such as developmental issues and processes of change, and has attempted to

strengthen his theory by adding beliefs and strategies in the typology.<sup>6</sup> Despite its limitations, Campbell and Borgen describe Holland's theory and model as the most useful contribution for both the theoretical researcher and applied practitioner.<sup>9</sup> The Strong Interest Inventory incorporated Holland's 6 General Occupational Themes to help explain high and low scores on the Occupational Scales. The purpose of this study is to survey current licensed dental hygienists in the U.S. to identify broad and basic interest patterns within Holland's 6 General Occupational Themes.

## Methods and Materials

The population for this study was dental hygienists in the U.S., with a minimum age of 20 years and 3 plus years of experience in the field. While the exact number of active dental hygienists in the U.S. is unavailable, the Bureau of Labor Statistics reports there were 158,000 dental hygiene jobs in 2004.<sup>10</sup> Individual contact with each of the 50 licensing bureaus in the U.S. revealed that over 160,000 dental hygienists were currently licensed and active in November 2006. The researchers in this study used the in-state and out-state totals provided by 7 different states and found that an average of 20% of dental hygienists hold a license in a state where they do not live. Based on this analysis, the actual number of licensed dental hygienists in the U.S. may be closer to 128,000.

Members of the American Dental Hygienists' Association (ADHA) were chosen for this sample. About 23,000 licensed dental hygienists are members of the ADHA, representing approximately 18% of the population. Utilizing members of ADHA for this study provided a mixture of associate prepared and baccalaureate prepared dental hygienists working in clinical practice and in other settings such as education, corporation, research and public health.

All states that do not have a baccalaureate program were excluded from the study to increase the number of baccalaureate-prepared dental hygienists in the sample. Any state with fewer than 1,250 licensed dental hygienists was excluded from the study to ensure adequate numbers for the sample. Purposive sampling was used to include Minnesota from division 4 as the home state of the researcher. One state was randomly drawn from the remaining 8 divisions established by the United States Census Bureau representing a random, stratified national sample. The 9 states included in this study were Connecticut, Pennsylvania, Illinois, Minnesota, North Carolina, Tennessee, Texas, Colorado and California.

The ADHA member list did not include gender as a descriptor, so the inclusion of all males to obtain

Table I: Sections within 2004 Revised Strong Interest Inventory

Section:	Number of items:	Short-term (2 to 7 mo) test-retest reliability	Long-term (8 to 23 mo) test-retest reliability
Holland's Six GOTs	153	0.84 to 0.89	0.80 to 0.92
30 Basic Interest Scales	139	0.77 to 0.91	0.74 to 0.90
Occupational Scales	-b	0.71 to 0.93 <sup>a</sup>	-b

<sup>a</sup>Reliability based on 2 to 23 months.

<sup>b</sup>Not available.

an adequate number for gender comparison was not possible. However, the researcher did examine the list and include all names generally associated with male gender in an effort to increase the proportion of males in the sample.

After inclusion of males and known members with advanced degrees, ADHA members were randomly selected using a random number generator to comprise 200 members from each state, for a total of 1,800 participants. Campbell described adequate sampling for occupational scale development with samples of 400 preferred, 300 sufficient and 200 as adequate.<sup>11</sup> This sample size exceeds the recommendation of Campbell.

In order to obtain a high response rate considering the lengthy survey, which included the 291 items in the Strong Interest Inventory and 60 items in the Skills Confidence Inventory, the researcher attempted to follow Dillman's tailored design method for mail surveys, including multiple contacts to participants.<sup>12</sup> A postcard with 3 background questions was mailed along with the final contact letter to provide a way for the researcher to examine non-respondents' career satisfaction, educational attainment and primary reason for not participating.

Given that this investigation involves human participants, approval from the University Institutional Review Board for the Protection of Human Subjects in Research was sought and obtained prior to commencing this study.

**Strong Interest Inventory:** The Strong Interest Inventory was first published as the Strong Vocational Interest Blank in 1927.<sup>13</sup> One of the first occupations developed for this instrument was certified public accountants.<sup>14</sup> The 2004 Revised Strong Interest Inventory was used in this research to identify broad (e.g. Realistic, Artistic) and basic (e.g. Education, Healthcare) interest items within Holland's 6 General Occupational Themes of licensed dental hygienists in the U.S. Strengths of this instrument include:

1. Long history as the first formal interest inventory published in 1927

Table II: Demographics of Respondents to Paper Survey

	n	% <sup>a</sup>
Gender	928	100.0
• Female	983	96.6
• Male	31	3.4
• Missing	4	
Sampled States	928	100.0
• California	108	11.7
• Colorado	101	10.9
• Connecticut	95	10.3
• Illinois	99	10.7
• Minnesota	131	14.2
• North Carolina	94	10.2
• Pennsylvania	105	11.4
• Tennessee	81	8.8
• Texas	103	11.2
• Currently reside outside of sampled states	6	0.6
• Missing	5	
Race	928	100.0
• Caucasian	846	91.7
• African American	9	1.0
• Hispanic (all races)	42	4.6
• Asian	13	1.4
• Native American	3	0.3
• Other	10	1.1
• Missing	5	
Age	928	100.0
• 20-29	166	18.0
• 30-39	199	21.6
• 40-49	239	25.9
• 50-59	266	28.8
• 60-65	50	5.4
• 66+	3	0.3
• Missing	5	

<sup>a</sup>Valid percentages reported

2. Grounded firmly in empirical research
3. Practical and theoretical information
4. Based on normative sample, titled the General Representative Sample (GRS), that is representative of both genders and racial/ethnic diversity found in the U.S.<sup>15</sup>

Participants rank their preferences using a 5 point Likert scale for 293 items "made up of words or short phrases describing occupations, subject areas, activities, leisure activities, people and personal characteristics."<sup>15</sup> The Revised Strong Interest Inventory has 4 main sections:

1. General Occupational Themes
2. Basic Interest Scales
3. Occupational Scales
4. Personal Style Scales

Table I contains summary information about the sections of this instrument. The Personal Style Scales were not used in this study. Multiple studies have reported adequate validity and reliability of the General Occupational Themes when compared to alternate inventories.<sup>15-19</sup> Multiple studies have also reported adequate validity and reliability of the Basic Interest Scales when used to distinguish occupations.<sup>15,20-22</sup>

**Participants:** One thousand eight hundred dental hygienists in 9 different states who were members of the ADHA were mailed information to participate in this research. Thirteen participants were unreachable due to incorrect mailing addresses. A total of 928 participants completed and returned the paper survey, resulting in a 51.9% response rate for the paper surveys. In addition to returning the paper survey, 436 participants also completed the online surveys, resulting in a 24.4% response rate for both the paper and online surveys. Table II contains the demographic characteristics of the 928 dental hygienists who responded to the paper survey. The average participant was female, Caucasian, age 50 to 59 and approximately equally dispersed among the 9 sampled states.

**Non-respondents:** Postcards, with 3 questions, were sent to the 859 non-respondents with 199 returns (23.2%). The first question asked non-respondents to indicate the primary reason for not participating in the study. Seventy-eight percent of non-respondents who completed the postcard did not participate in the research due to time, while the remaining listed no computer/internet (9.5%), not working as dental hygienist (7.5%), unable to log on (0.5%), health reasons (0.5%) and unlisted (4.5%).

The second question on the non-respondent postcard asked non-respondents to indicate all degrees earned at a post-secondary institution. The majority of non-respondents had earned an associate degree or certificate in dental hygiene, 48% had earned a bachelor degree and 11.2% had earned a master or doctoral degree.

Mann-Whitney tests were used to compare levels of degree attainment among respondents and non-respondents (postcards only). Participants who completed the paper and online surveys had earned significantly higher degrees than non-respondents ( $p=0.001$ ). Participants who completed the paper and online surveys had also earned significantly higher degrees than participants who completed only the paper survey ( $p=0.002$ ).

The final question on the non-respondent postcard asked "If you were to choose a career today, would you choose dental hygiene?" This question was utilized to measure global satisfaction with dental hygiene as a career choice. Potential answers included definitely no, probably no, probably yes and definitely yes. In each of the groups, about 84% indicated they would probably or definitely choose dental hygiene today. Mann-Whitney tests were utilized to compare global satisfaction of career choice among respondents and non-respondents. Results contained in Table III indicate that no significant differences were found between any of the groups.

## Results

Results of this study have the potential to positively impact the recruitment and advising of students regarding career track choice and satisfaction within dental hygiene.

**Broad Interest Patterns of Dental Hygienists Compared to GRS and Dentists:** This research compared a national sample of dental hygienists to the GRS used as the reference group for the Strong Interest Inventory. Independent t-tests revealed that dental hygienists had significantly higher mean scores in the Realistic, Investigative, Artistic and Social General Occupational Themes as compared to the GRS. Dental hygienists scored the greatest difference from the GRS in the Investigative theme ( $t=11.93$ ), followed by the Social theme ( $t=8.08$ ) and the Realistic theme ( $t=7.69$ ). These results support coding the dental hygiene profession as Investigative-Social-Realistic (Table IV). The mean differences of dental hygienists working in public health or working as a clinician, educator or manager were also examined. Specific to career settings, dental hygiene clinicians may score higher in the Investigative theme, as compared to dental hygienists in other settings. Dental hygiene managers may score higher in the Enterprising theme, as compared to dental hygienists in other settings.

The researcher was unable to identify any published research describing the broad interest patterns of dental hygienists within Holland's General Occupational themes using the 2004 Strong Interest Inventory. The 1993 version of the Strong Interest

Table III: Mann–Whitney Tests of Career Choice Today by Group

	Mean Rank	Mann–Whitney U	Z	Sig. (2 tailed)
Paper Survey Only	463.73			
Paper & Online	457.93	104348.5	-3.59	0.719
Paper Survey Only	340.73			
Non-respondents (Postcard Only)	332.76	44937.5	-.518	0.605
Paper & Online	313.03			
Non-respondents (Postcard Only)	309.63	40565.0	-.236	0.814

Table IV: Comparison of General Occupational Theme Mean Scores between Women in General Representative Sample (GRS) and Satisfied Women Working in a Dental Hygiene Field (DHYG)

Theme	DHYG		GRS		df	t	p
	$\bar{X}$	SD	$\bar{X}$	SD			
Realistic	49.04	8.19	44.97	8.42	1,445	7.69***	<.001
Investigative	55.88	8.10	48.56	10.12	1,445	11.93***	<.001
Artistic	52.96	9.31	51.31	10.19	1,445	2.61**	0.009
Social	56.93	9.23	51.94	9.92	1,445	8.08***	<.001
Enterprising	49.74	9.49	49.61	9.81	1,445	0.21	0.833
Conventional	49.84	10.12	49.43	10.63	1,445	0.21	0.833

\*\*p<0.01

\*\*\*p<0.001

Inventory published the General Occupational Theme mean scores of female dental hygienists and determined their highest area of broad interest to be Enterprising, with Investigative and Social as supporting themes. This researcher found that dental hygienists had the lowest mean score differences from the GRS in the Enterprising and Conventional themes.

Two previous studies examined the broad interest levels of dentists. Emling et al surveyed 124 freshman dental students along with 104 fellows using the Strong–Campbell Interest Inventory.<sup>23</sup> This older edition of the Strong Interest Inventory used 325 items to examine responses in 3 major categories: General Occupational Themes, Basic Interest Scales and the Occupational Scales. While specific items have changed slightly with the newer version of the Inventory, the General Occupational Theme scores are still composed of the same 6 themes based on Holland’s theory, and are normed to a mean of 50 and a standard deviation of 10. Both dental students and fellows scored the highest mean scores in the Realistic and Investigative themes. While dental hygienists also scored high in the Investigative theme, dentists may differ from dental hygienists in both the Realistic and Social themes (Table V).

Emling et al examined the broad interests of 86 senior dental students using the same version of the Strong–Campbell Interest Inventory.<sup>24</sup> Similar to the

findings of earlier research, male dental students were found to have the highest mean scores in the Realistic and Investigative themes, while female dental students were found to have the highest scores in the Artistic and Investigative themes.

The 1993 version of the Strong Interest Inventory published the General Occupational Theme mean scores of female dentists and determined their highest area of broad interest to be Investigative, with Realistic and Artistic as supporting themes. These areas of broad interest match well with the findings of Emling et al.<sup>24</sup> The 1993 version of the Strong Interest Inventory also assigned broad interest areas to male dentists to be Investigative–Realistic, similar to the findings of Emling et al.

The 2004 Revised Strong Interest Inventory separates interest scores according to gender. Since dental hygiene is predominantly populated with females, comparing female dentist interests to female dental hygienists may be better matched. While both female dentists and dental hygienists scored high in the Investigative theme, female dentists scored higher in the Artistic theme, while female dental hygienists scored higher in the Social theme.

**Basic Interest Patterns of Dental Hygienists Compared to GRS and Dentists:** This research compared a national sample of dental hygienists to

Table V: Comparison of Basic Interest Scales' Mean Scores between Women in General Representative Sample (GRS) and Satisfied Women Working in a Dental Hygiene Field (DHYG)

Theme	GRS		DHYG		t	p
	$\bar{X}$	SD	$\bar{X}$	SD		
<b>Realistic BIS</b>						
• Mechanics & Construction	45.47	8.46	48.65	8.59	5.55**	<0.0001
• Computers & Electronics	46.42	9.22	45.53	8.31	1.56	0.1189
• Military	46.11	8.25	47.84	7.84	3.35***	0.0008
• Protective Services	49.29	9.56	49.78	8.93	0.82	0.4108
• Nature & Agriculture	48.32	10.37	54.69	9.19	9.96***	<0.0001
• Athletics	47.12	9.09	51.43	8.84	7.55***	<0.0001
<b>Investigative BIS</b>						
• Science	47.95	9.93	55.08	8.31	11.76***	<0.0001
• Research	48.40	10.15	51.06	9.69	4.19***	<0.0001
• Medical Science	49.71	10.39	62.28	8.39	19.93***	<0.0001
• Mathematics	47.77	9.84	48.39	9.41	1.01	0.3140
<b>Artistic BIS</b>						
• Visual Arts & Design	50.74	10.37	52.17	9.32	2.23*	0.0259
• Performing Arts	51.82	10.01	54.64	8.97	4.56***	<0.0001
• Writing & Mass Communication	50.79	10.39	50.17	9.71	0.96	0.3384
• Culinary Arts	51.57	9.69	55.79	8.69	7.05***	<0.0001
<b>Social BIS</b>						
• Counseling & Helping	52.29	9.88	55.91	8.69	5.95***	<0.0001
• Teaching & Education	50.81	10.32	55.71	9.72	7.61***	<0.0001
• Human Res. & Training	50.57	10.36	52.39	8.79	2.87**	0.0042
• Social Sciences	50.42	10.24	51.18	8.93	1.21	0.2277
• Religion & Spirituality	50.23	9.79	55.20	9.36	8.11***	<0.0001
• Health Care Services	51.18	10.73	64.15	8.21	20.07***	<0.0001
<b>Enterprising BIS</b>						
• Marketing & Advertising	51.03	10.13	49.92	9.10	1.77	0.0766
• Sales	48.82	9.29	51.45	9.58	4.45***	<0.0001
• Management	48.93	9.88	49.17	9.38	0.39	0.6976
• Entrepreneurship	48.94	10.05	46.09	10.10	4.48***	<0.0001
• Politics & Public Speaking	47.42	9.57	46.33	9.02	1.82	0.0682
• Law	49.51	10.06	48.36	10.10	1.81	0.0710
<b>Conventional BIS</b>						
• Office Management	52.27	10.77	52.53	9.12	0.39	0.6932
• Taxes & Accounting	48.93	10.51	49.06	10.26	0.20	0.8441
• Program & Info. Systems	48.14	10.35	45.22	9.31	4.56***	<0.0001
• Finance & Investing	47.53	9.34	48.10	8.51	0.98	0.3251

\*p<0.05

\*\*p<0.01

\*\*\*p<0.001

the GRS used as the reference group for the Strong Interest Inventory. Independent t-tests revealed that dental hygienists had significantly higher mean scores in 16 of the 30 Basic Interest Scales as compared to the GRS. The most significant mean differences were in the Healthcare Services, Medical Science, Science, Nature and Agriculture, Religion and Spirituality, Teaching and Education and Athletics Basic Interest Scales (Table VI).

The Basic Interest Scale mean differences of dental hygienists working as a clinician, educator, manager and working in public health were also examined (Table VII). Specific to career settings, public health workers scored higher within the Research, Counseling and Helping and Social Sciences Basic Interest Scales. Educators scored higher in the Research, Performing Arts, Counseling and Helping and Teaching and Education Basic Interest Scales.

Managers scored higher in the Human Resource and Training, Marketing and Advertising, Management, Entrepreneurship and Office Management Basic Interest Scales. Dental hygiene clinicians scored higher in the Medical Science and Healthcare Services Basic Interest Scales.

Gasser et al examined the concurrent validity of the 2005 Strong Interest Inventory based on a national college sample of 1,403 women.<sup>25</sup> Cross-validation of findings was completed on a sample of 469 males. Discriminant analyses were completed to examine the ability of the General Occupational Themes to predict college major as compared to the Basic Interest Scales. Using 31 college majors as the criterion variable, Gasser et al found that the General Occupational Themes alone accurately classified 15.5% of the majors and the Basic Interest Scales alone accurately classified 33.7% of the majors, as compared to chance (3.2%). The current research supports the findings of Gasser et al in that the Basic Interest Scales may be the most effective at distinguishing career interests in dental hygiene, by setting.

This researcher was unable to identify any published research describing the basic interest patterns of dental hygienists within Holland's General Occupational themes using the 2004 Strong Interest Inventory. The 1993 version of the Strong Interest Inventory did not publish the Basic Interest Scale mean scores of female dental hygienists.

Two previous studies examined the basic interest levels of dentists. Emling et al surveyed 124 freshman dental students along with 104 fellows using the Strong-Campbell Interest Inventory.<sup>23</sup> This older edition of the Strong Interest Inventory used 325 items to examine responses in 3 major categories: General Occupational Themes, Basic Interest Scales and the Occupational Scales. Unfortunately, the basic interest scales in the Strong Interest Inventory have changed and so limit comparisons. However, the Basic Interest Scales were still normed to a mean of 50 and a standard deviation of 10. Dental students scored the highest mean scores in the Medical Science, Medical Service, Mechanical Activities and Athletics Basic Interest Scales. Dental fellows scored the highest mean scores in Medical Science, Military Activities, Mechanical Activities and Science Basic Interest Scales. While dental hygienists also scored high in the Medical Science and Healthcare Services Basic Interest Scales, it appears they may differ in other scales. However, only 25 female dental students were part of the 1980 study, and it is probable that gender differences were demonstrated in the Basic Interest Scales.

Emling et al examined the broad interests of 86

senior dental students using the same version of the Strong-Campbell Interest Inventory.<sup>24</sup> Since dental hygiene is predominantly populated with females, comparing female dentist interests to female dental hygienists may be of more value. Female dental students were found to have the highest mean scores in the Medical Science, Music, Art, Domestic Arts and Nature Basic Interest Scales. While both female dentists and dental hygienists scored high in the Medical Science and Nature Basic Interest Scales, they appear to differ in the Arts.

**Dental Hygiene Occupational Scale:** Currently, 122 occupations for both males and females are represented in the 2004 Revised Strong Interest Inventory. However, dental hygiene has not been developed. According to protocol defined within the Revised Strong Interest Manual, items with a 16% or greater difference between the criterion group and the same-gender GRS were used as the starting point for inclusion within the dental hygiene occupational scale.<sup>13</sup> Specific Occupational Scale item responses from the GRS are needed for comparison in order to construct an Occupational Scale for dental hygienists. The researchers were unable to review this specific Occupational Scale data from the GRS, but CPP (formerly Consulting Psychologists Press) was willing to construct the dental hygiene Occupational Scale for this study. The female dental hygiene scale for the 2004 Strong Interest Inventory was developed from the sample collected by the researcher (n=322) with 30 items, with a minimum percent difference of 25%, and a Q of 1.68. Insufficient numbers of male dental hygienists prevented construction of an occupational scale for male dental hygienists.

On average, the Occupational Scales in the Strong Interest Inventory differ from the comparison sample (GRS) by about 1.5 standard deviations. For the female dental hygienists Occupational Scale, the occupational sample differs from the comparison sample (GRS) by about 1.7 standard deviations on average. This suggests that the dental hygiene occupational scale is more tightly defined and distinct from other occupations, resulting in higher validity, as compared to the average occupational sample within the Strong Interest Inventory.<sup>13</sup> A sample of the 30 discriminating items selected for dental hygienists included the following: biologist, dental assistant, dentist, determining the cause of a disease and giving first aid assistance.

Female dental hygienists in this sample had mean scores most similar to pharmacists, registered nurses, respiratory therapists, radiologic technicians, dietitians, recreation therapists, chiropractors, nursing home administrators and dentists. Paired sample t-tests were used to compare the dental hygien-

ists' mean scores between the dental hygiene Occupational Scale and the 9 most similar Occupational Scales. Significant differences were found between the dental hygiene Occupational Scale and all 9 similar Occupational Scales. Examining the t values, dental hygienists were the most similar to respiratory therapists ( $t=-3.82$ ) and radiologic technologists ( $t=-4.79$ ). Of the 9 similar Occupational Scales, dental hygienists were the least similar to chiropractors ( $t=-17.82$ ) and dentists ( $t=-17.83$ ).

## Conclusion

This research suggests that female dental hygienists should be coded as Investigative–Social–Realistic using the General Occupational Themes. The General Occupational Themes demonstrate some potential in ability to distinguish the broad interests of dentists and dental hygienists. Using the Basic Interest Scales from the Strong Interest Inventory dental hygienists scored the highest in the areas of Healthcare Services, Medical Science and Science. In particular, individuals who score high on the Health Services Basic Interest Scale may want to consider dental hygiene as a potential career choice. The ability to distinguish dental hygienists from dentists with Basic Interest Scale mean scores is limited, influenced by the lack

of current research. If an assessment measure specific to dental hygiene is developed, researchers may want to examine the applicability of items from those Basic Interest Scales to help determine similar interests.

Career assessment instruments such as the Strong Interest Inventory could also be utilized by education institutions during summer orientations or freshman orientation courses to identify students' career interests. In addition, departments or colleges could develop and implement introductory courses designed to increase awareness about the careers available in that unit, while emphasizing assessment of person–fit to environment with career assessment instruments. Opportunity for secondary students to attend an introductory course may enable earlier assessment of career fit and promote obtainment of degree within 4 years. Currently, the program requirements for a baccalaureate degree may not afford college students with much opportunity for career exploration, to assure completion within 4 years.

*Angela L Monson, RDH, PhD, is an associate professor at the Minnesota State University School of Dental Hygiene.*

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