What Frames of Reference Underlie Self-Ratings of Oral Health?*

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Abstract

Objectives: This study aimed to investigate the referents and meanings that underlie self-ratings of oral health and to determine whether they vary by participants' characteristics. **Methods:** Semistructured interviews were conducted with a convenience sample of 80 adults who were asked to rate their oral health and explain the reasons for their ratings. The interviews were tape-recorded, transcribed in full, and subject to a content analysis that involved identification and coding of their frames of reference. These codes were collapsed to create a smaller number of categories to allow for comparisons of the proportions invoking each frame of reference. **Results:** There was considerable variation in the accounts offered to support the self-ratings of oral health. The most common referents used were biomedical, involving current oral problems, treatment needs and treatment histories, and behavioral, which included oral self-care practices, other health behaviors, and dental visiting patterns. Pain and tooth loss were also common. Most notable was the absence of functional and psychosocial referents that are prominent in contemporary definitions and measures of "oral-health-related quality of life." There was some variation in the referents used according to sociodemographic characteristics, with age being the main source of variation. There was also variation according to the category of the self-rating used; those with favorable ratings tended to use different frames of reference than those with unfavorable ratings. **Conclusions:** The biomedical model and professional ideologies and values provide the main frames of reference that give meaning to self-ratings of oral health. Variations in the meanings of the self-ratings have some implications for the use of this item in quantitative studies, which warrants further investigation.

Key Words: self-rated oral health, subjective health, qualitative research

Introduction

One of the most commonly used types of questions on health surveys is a global self-rating. Here, individuals are asked to rate their general and/or oral health on a scale that usually ranges from "excellent" to "poor" (1). It is generally agreed that these global ratings provide a summary of how people perceive their health, both objectively and subjectively, and, given their close association with scores from multi-item, multidimensional health status scales and indexes, they may be as useful as these scales and indexes in assessing the health status of patients and populations (2). For example, it has been suggested that, where questionnaire resources are limited, these single-item measures can substitute for much longer indexes and scales.

In addition, a substantial body of research indicates that these ratings are powerful predictors of survival, functional decline (3,4), and use of health care services (5). Fewer studies have been undertaken with respect to oral health, but those that have indicate that self-ratings of oral health are independent predictors of concurrent and future self-ratings of general health (6), oral functional decline, and predictors of concurrent proxy measures of quality of life (7-9). Given their widespread use and predictive potential, two important questions need to be addressed. First, how do we account for the predictive power of self-ratings of general and oral health? The answer to this question depends on the answer to a second: What do they measure? That is, what dimensions, frames of reference, and meanings underlie self-ratings of health?

Two approaches have been used to study these issues: quantitative and qualitative (10). The first involves the use of large and often random samples and correlational and regression analyses to assess the associations between multi-item, multidimensional measures of health status, single-item measures of behaviors, and/or other attributes and global ratings of health (11,12). While this is a useful approach and one that has provided some valuable insights, it has a number of important limitations. The main problem is that the scales and items used as predictor variables are based on the investigator's assumptions about the dimensions or factors that are important in shaping people's evaluations of their health. This may be why, in these analyses, much of the variation in self-rated health is not accounted for (10). In addition, these correlation and regression techniques identify the correlates or predictors of self-rated health rather than their meaning.

By contrast, the qualitative approach uses semistructured interviews with relatively small, convenience samples to identify the frames

of reference underlying summary measures of health (1,10). The main questions addressed by such studies are: "What is it that people are saying when they rate their health? What do they mean?" (13). Some studies take a strictly qualitative approach and identify frames of reference, while others code these frames of reference and subject the reduced data to simple quantitative analysis to determine whether meanings vary according to sociodemographic characteristics and according to the categories of the self-rating. That is, do people who rate their health as "excellent" use a different frame of reference than those who rate their health as "poor"? However, such studies are rare (13).

For example, Manderbacka (14) undertook semistructured interviews with 40 people aged 35 to 64 years who had taken part in a national study of living conditions in Finland. They were asked to describe their health in their own words and to give their reasons for rating their health on a continuum from "excellent" to "very poor." Health was described as the presence or absence of disease states, as the ability to function in relation to the person's life circumstances or environment, as the experience of physical and psychosocial symptoms and as fitness- and health-promoting behaviors. Manderbacka (14) concluded that "the health the respondents were constructing was not an abstract, general construct but a varied, concrete, contextual sometimes contradictory concept drawing on different sources of information." Similarly, Jylha (15) found that the concept of health that emerged in response to the question of why people rated their health in certain ways "was complex and context bound" and "negotiated through comparisons and relativities." Kaplan and Baron-Epel (1) conducted interviews with 383 adults aged 20 years and above and identified three models on which assessments of health status were based. These were the biomedical or disease-oriented model, the emotional or general-feeling model, and the functional-related model. Health-promoting or health-damaging behaviors and lifestyles were uncommon as frames of reference in judgments concerning health status.

A more quantitative approach to the analysis of qualitative data was used by Groves et al. (16) who conducted interviews with 100 respondents who were asked to rate their health and explain the basis of their ratings. Coding of first responses, that is, the first referent mentioned, indicated that almost a third (31 percent) mentioned the presence or absence of illness, 14 percent mentioned health behaviors, 7 percent mentioned physical functioning, and 6 percent mentioned health-service use.

A similar study was undertaken by Krause and Jay (10) who conducted 158 semistructured interviews with US adults. Transcripts of the interviews were coded with multiple codes being allocated as necessary to capture the full range of referents mentioned. Overall, 91 separate codes were required. In order to facilitate simple quantitative analysis, these codes were reduced to nine "conceptually meaningful categories," and each respondent was given a single code based on those categories. As with Groves et al. (16), where more than one initial code had been applied, the respondent was coded according to the first referent mentioned in their explanation. A majority of respondents, 70 percent, mentioned some physical health factors, either the presence or absence of health problems, physical functioning or their general physical condition, as the bases of their self-rating of health. Positive and negative behaviors were mentioned by 24 percent, and 6 percent based their rating on comparisons with other persons. Simple cross-tabulations indicated some subgroup differences in the referents used with the most marked being according to age.

Idler et al. (13) have criticized the general tendency to use "first mentions" only when summarizing and quantitatively analyzing qualitative data because it leads to a substantial loss of information and masks the "complexity and multilayered" character of health ratings. In order to manage the problem of "multiple mentions," they created a hierarchy of referents that ranged from the "most restrictive and biomedical" to the "most wholistic and inclusive." This hierarchy consisted of six categories: a) narrow biomedical referents; b) those that include functioning; c) those that incorporate health behaviors; d) those that refer to the ability to perform social activities; e) those including reference to social relationships; and f) those that mentioned psychologic, emotional, or spiritual criteria. Each subject was given one code reflecting the most inclusive referent they employed. In a study of 159 older African-Americans, just over half employed medical or functional criteria, while just under one-half also referred to behaviors, social activities, and psychologic and emotional states. However, while a data reduction approach based on a hierarchy of inclusivity/exclusivity is somewhat more sophisticated than an approach based on first mentions, it still masks much of the complexity of respondents' accounts.

Although there have been a number of qualitative studies of perceptions of oral health (17-19), studies of the frames of reference used in self-ratings of oral health have not been undertaken. Studies are needed to address questions similar to those posed by investigations of self-rated general health: What frames of reference underlie self-ratings of oral health? Do the referents vary by sociodemographic characteristics? Do they vary by self-rated oral health? Are the referents underlying general and oral health ratings similar? Do the referents used reflect contemporary professional definitions of oral health that place emphasis on the functional and psychosocial impacts of oral disorders? Can single-item self-ratings of oral health substitute for multi-item, multidimensional measures, such as the Oral Health Impact Profile, which

assess these impacts? Consequently, we undertook a qualitative and quantitative study largely modeled on the work of Krause and Jay (10) and Idler *et al.* (13) in order to begin the process of providing answers to these questions.

Methods

Subject Selection. Participants in the study were a convenience sample of community-dwelling adults aged 18 years and above. An initial sample was recruited by advertisements in apartment buildings, educational institutions, and homes for the aged with additional participants recruited by using snowball or referral techniques (13). Recruitment was undertaken in two large urban centers in Southern Ontario, namely, the cities of Toronto and London. Our aim in using the recruitment approach adopted was to acquire a sample that was as diverse as possible in terms of age, gender, educational attainment, and self-rated oral health. In terms of gender and age, we aimed to recruit equal number of male and female participants and equal number of young, middle-aged, and older adults. There was no upper age limit to recruitment. The only other criterion influencing recruitment into the study was a command of the English language sufficient to enable the individual to participate in an in-depth interview conducted in English.

In qualitative studies, which include individuals with specific health or behavioral characteristics, saturation is often achieved after 25 to 30 participants have been interviewed (20). Because we wanted to include sufficient numbers for comparisons of proportions according to sociodemographic and other characteristics, we arbitrarily set the sample size at 80.

Data Collection. The interviews with participants were semistructured and guided by a relatively simple data collection instrument. The initial question was closed ended and asked participants to rate the health of their teeth and mouth using the conventional five-point response scale (Excellent, Very good, Good, Fair, Poor). They were then asked an open-ended question as to why they rated their oral health in that way. Nondirective, open-ended probes were used if necessary to obtain further detail regarding the issues raised by the participants in their responses to the "why?" question. Directive, open-ended probes concerning oral symptoms, oral function, dental visiting, oral self-care practices, dental treatment history and experiences, and the appearance of the teeth were then asked. We also collected simple, sociodemographic data such as age, gender, place of birth (Canada or elsewhere), and educational attainment. Data on income, dental insurance coverage, or length of time in Canada for those born elsewhere were not collected. The interviews were conducted by two trained research assistants neither of whom were members of the dental professions. The interviews were tape-recorded and transcribed in full.

Prior to being interviewed, all participants signed a consent form. The study was approved by the Health Sciences Committee of the University of Toronto's Office of Research Ethics.

Data Coding and Analysis. The main aim of the analysis was to identify the referents participants used in explaining their oral health ratings. This was a relatively simple process and somewhat different from the identification of themes in interview transcripts (17). In order to facilitate the reporting and analysis of data, the interview transcripts were coded. For the purposes of this article, coding and analysis were limited to the participants' spontaneous responses to the initial open-ended question that followed the closed-ended ratings of their oral health and to the nondirective probes used to obtain more detailed information. Responses to the directive probes were not used here because they may have supplied the respondents with, rather than reveal their own, frames of reference.

The main methodological challenge with respect to the coding process was to preserve the detail of participants' accounts while accommodating what has been referred to previously as "multiple mentions" (13). That is, while some accounts were simple and utilized a single frame of reference, others were complex and could not be captured by means of a single code (10,13). Consequently, the content of even brief responses often required the allocation of more than one code. The maximum number of codes used for any account was seven.

The coding process was undertaken by the three authors at a series of meetings, and the coding scheme was developed by using a cumulative process. That is, the interviews were coded in batches of 10 to 15 at a time. Initially, each of the three coders reviewed the transcripts independently and highlighted portions of the text to be coded. The coding process always occurred jointly. In order to code new transcripts, the list of codes already allocated was reviewed and applied if the codes fit the data. If not, new codes and verbal descriptors were created and applied to the data. Subsequently, the codes were collapsed into a more manageable number based on commonality of content. As explained later, the final coding scheme consisted of six categories. In order to fully preserve the content of participants' responses, each was allocated from one to six final codes. We did not follow Krause and Jay (10) or Idler *et al.* (13) and reduce the data further by selecting a single code to characterize each person because this masks the complexity and character of what was said. The rationale for this approach is apparent later in the article.

The quantitative analyses were simple and limited to a description of the percentage of participants invoking each of the six summary types of referent by gender, age, education, place of birth, and oral health rating. Because this was a convenience rather than a random sample, inferential statistical tests were not used

to test for differences between groups. Rather, a rule of thumb was applied whereby groups were deemed to be different if there was a 15 percent difference across categories in the percentage invoking a given referent.

Results

Characteristics of the Participants. Table 1 indicates that the recruitment strategy was broadly successful in terms of the diversity of the sample. Approximately half the participants were female, the age range was 22 to 97 years with half over the age of 50, and half had completed some form of postsecondary education. Two-thirds were born in Canada, and one-third were born outside of Canada. However, it should be noted that 16 of the 22 participants aged 65 and over were female; 14 of the 17 participants with the lowest level of education were in the oldest age group, and 13 were female, and 23 of the 29 born outside Canada were over the age of 40 years.

Table 1 also shows the distribution of responses to the self-rating of oral health. The majority rated their oral health as "excellent," "very good," or "good," and one-fifth rated it as "fair" or "poor." The majority of the participants were healthy with only 15 percent rating their general health as only "fair" or "poor."

Characteristics of the Participants' Accounts of Their Oral Health Ratings. When asked to explain their oral health ratings, all participants were able to give a clear account of why they rated their oral health as such. However, their accounts showed considerable variability. There were four sources of variability. First, the main source of variation was in terms of the type of referents, that is, the biomedical, behavioral, and other characteristics or attributes that were invoked in explaining the meaning of the ratings. Second, the accounts varied in terms of their complexity. Approximately a quarter, 26 percent, referred to only one characteristic or attribute and could be represented by a single code. Forty percent required two codes, 22 percent three codes, while 11 percent needed four or more codes. The mean number of codes allocated was 2.2 (standard deviation = 0.96). Third, some accounts were based on the presence of certain characteristics or

attributes and others on their absence; and fourth, some were limited to the present point in time, while others referred to both the present and past and incorporated aspects of the participants' oral health and personal biographies.

The following are examples of fairly simple responses used to support ratings of "good" to "excellent."

Interview 78: Male aged 42. Rating: Good
Interviewer: Can you explain a little bit why you say good?
Participant: Because I'm not in pain . . . it doesn't hurt.

Interview 28: Male aged 30. Rating: Very good.
Interviewer: Now why do you say very good?
Participant: Um.. I haven't had cavities in a very long time and I think I've had a total of four in my lifetime.

Interview 68: Female aged 39. Rating: Excellent.
Interviewer: Why do you say excellent?
Participant: Every time I go to the dentist that's what they say. They say "This is excellent. You've been doing a great job."

Interview 21: Female aged 39. Rating: Excellent.
Participant: Um it's excellent. I take extremely good care of my teeth.
Interviewer: What do you do?
Participant: Daily brushing more than once a day, almost after every meal, uh flossing, gum stimulation. I go for regular check-ups, regular cleaning and regular maintenance and up-keep.

Interview 16: Female aged 47. Rating: Excellent
Interviewer: Why do you say that?
Participant: Because I have all of my teeth. Well, I have two bridges but I still have all of my own teeth.

The first participant rated his oral health as "good" using the absence of pain as the only referent. The next invoked the long-term absence of

Table 1
Characteristics of Participants

	Number of subjects	%
Gender		
Male	36	45.0
Female	44	55.0
Age		
39 and below	28	35.0
40-64	30	37.5
65 and above	22	27.5
Education		
High school or less	16	21.2
Some college/university	20	25.0
Completed college/university	43	53.8
Place of birth		
Canada	51	63.8
Elsewhere	29	36.2
Rating of oral health:		
Excellent	11	13.8
Very good	29	36.3
Good	24	30.0
Fair	12	15.0
Poor	4	5.0

new disease, in the form of "cavities," as his referent along with minimal disease experience over his lifetime, while the fourth made reference to her dentist's opinion regarding the state of her oral health. The fourth participant's rating of "excellent" was based on the extremely good care she took of her teeth with exemplary oral hygiene practices and regular dental visits for cleaning and maintenance of her dentition. The last participant rated her oral health as very good based solely on the fact that she had retained most of her own teeth. For these individuals, oral health is rated favorably if there is freedom from pain and disease, if it is favorably evaluated by the dentist, if the teeth and mouth are the object of care and attention, or if the natural dentition has been maintained into later life.

Similarly, simple responses were also used to support unfavorable ratings of oral health:

Interview 17: Female aged 89. Rating: Fair

Interviewer: Would you say that health of your teeth or mouth is excellent, very good, good, fair or poor?

Participant: Well, I have dentures.

Interviewer: But how would you rate it?

Participant: How would I rate it now I've got the dentures? I would say fair.

Interview 24: Female aged 53. Rating: Fair

Interviewer: Could you expand on that and tell me why you rated it as fair?

Participant: Because I took care of my teeth for a long time . . . saw a particular dentist with whom I'm no longer happy so I've neglected my teeth for about two years. It's been two and a half years since I've seen a dentist.

For the first participant in this sequence, the wearing of dentures is sufficient in and of itself to warrant a rating of "fair," while, for the second, neglecting her teeth by avoiding visiting the dentist is used to support her rating of "fair." Here, a neglected mouth is an unhealthy mouth.

The following extract illustrates a more comprehensive response to the "Why do you rate you oral health in that way?" question in which multiple referents are invoked and organized into what can be called an oral health biography.

Interview 37: Male aged 47. Rating: Very good.

Interviewer: What leads you to say that?

Participant: Well I haven't had a cavity in 25, 30 years. I think I had about average cavities. I think I maybe had five or something. I used to have braces so I brush my teeth two or three times a day and floss my teeth and anytime I go to the dentist all I need is a cleaning and that's it. I used to go every six months but now I go every year because my dentist says there is no reason. I don't have tartar build up and I don't have any problems with teeth or gums.

This contains seven different referents: a long-standing absence of new disease (cavities), a lifetime history of minimal disease activity and treatment needs (only five cavities), a comparison with undefined others (average number of cavities), appropriate oral hygiene behaviors (brushing and flossing), absence of current treatment needs (cleanings only), his dentist's view of his disease risk (yearly rather than biannual visits), and the absence of current problems with his teeth or gums. In response to the nondirective probing, he made further reference to a professional's opinion regarding his oral hygiene practices and his standing in comparison with others.

"The hygienist, she was saying that you know, I am not the best person that they got in there but you know I look after my teeth a lot better than most people she said so. . . ."

Later in the interview, he elaborated on this dental treatment history and reported having some teeth extracted but only for orthodontic purposes and having an anterior tooth crowned because of an injury sustained in childhood during play. However, these treatment experiences are presented in ways that do not compromise his view of his oral health as "very good." Unlike other participants, unfavorable health behaviors did not lead to a more negative oral health rating. Although he reported that his diet was terrible, "I don't buy groceries, I eat out most of the time, I eat too many sweets and I drink too much Coke," this reinforced rather than undermine his conception of his oral health as "very good." As he continued, "I should have really bad teeth. I don't know, maybe I am lucky. I keep telling myself I have to get it together, so it might be fluoride in the water or luck."

All of these referents are then organized into a coherent biography that incorporates the presence and absence of positive and negative attributes and behaviors and refers to the present and the past and to self and others with events and experiences linked into an explanatory framework that gives meaning to his rating of his oral health.

Similarly, complex rationales were provided by some of those who rated their oral health as only "fair" or "poor." For example:

Interview 79: Female aged 51. Rating: Fair.

Participant: I just had my teeth cleaned and I have my teeth cleaned every three months. I would say that its fair just because even though I have my teeth cleaned regularly there's a lot of work that's need to be done on it.

Interviewer: Why do you say fair? So you say . . . ?

Participant: Okay, I'll say because I grind and I've had TMJ and I'm not good at wearing my night guard. It's one of the reasons. The second reason is . . . when I was in sixth grade I had a bad bicycle accident

and I put my . . . two front teeth though my lip. And they found out that as an adult . . . my two front teeth were dead. And I had them capped at that stage. So the wear and tear of the grinding as well as having two dead front . . . teeth has always made me very aware of my dental health. But I do . . . cleanings every three months. I brush my teeth after every meal and I . . . floss after every meal. And so I'm just very conscientious. I would love . . . to have my whole mouth rebuilt.

Interviewer: Your what?

Participant: I would love to have my whole mouth capped and rebuilt. They capped . . . everything because I had worn them way down too much . . . but they are . . . beginning to have a lot of wear and tear now as well because it's been seven . . . years.

Again, this participant invokes six referents, some positive and some negative. On the positive side, she reports appropriate dental visiting behaviors and exemplary oral hygiene practices involving frequent brushing and flossing to an extent that, as she reported later in the interview, "the dentist said to me one time, you know you could floss a little less. There is such a thing as flossing too much." However, she also reports several dental conditions, some past and some current, including trauma to the anterior teeth, which happened as a child enters adulthood and acquires "dead teeth," temporomandibular joint problems and grinding, which have resulted in the need for extensive dental rehabilitation with most of her teeth "capped." The wear and tear associated with her grinding, partly as a result of her failure to wear her night guard, mean that she requires substantial treatment to rebuild her whole mouth. Here, a complex treatment history, current problems, and extensive treatment needs lead to a definition of her oral health as only "fair" in spite of her taking "conscientious" care of her mouth.

The above extracts illustrate many of the features of the participants' accounts of their oral health ratings. However, there are other features that are worth noting because they cast further light on the variations in the conceptions of oral health that underlie those ratings. One is that some respondents usually spontaneously or occasionally, in response to an interviewer's question, differentiated between the categories of the self-rating scale. For example, a 42-year-old man who rated his oral health as "very good" said, "Its not excellent because I don't floss as much as I should," and a 36-year-old woman, also giving a "very good" rating, said, "Because I am a smoker I can't say its excellent, but its very good," and a 74 year-old man, also with a "very good" rating, said, "Well I have false teeth, that's why I don't say excellent." For some respondents, "excellent" was a state difficult to obtain. A 27-year-old woman explained, "Excellent would be perfect so no problems no cavities no problems so because I have a few I would be very good." Where these distinctions were made, it was usually between the "very good" and "excellent" categories. One 24-year-old woman, rating her oral health as "good," explained why she had not used the "excellent" category, which to her also implied perfection: "Because I used to floss. So I don't do it any more and I think that makes a difference for me personally. I just like to be extra clean to be excellent. I think excellent for me, the standard of excellent is, you know, doing that extra . . . . . ."

A 59-year-old man, explaining why he used the "good" and not the "excellent" category, illustrates a further feature of the participants' accounts, recognizing a difference in the health state of different mouth parts:

I would not say excellent because my teeth are crooked and I have lots of cavities that slowly but surely are falling out and need to be replaced. But when they clean most of the gum recession numbers are good.

Other examples are a woman of 40 who rated her oral health as "poor, " saying, "Well, I have really bad teeth. Actually I had it since I was a young kid, I started doing the filling of my teeth when I was about 13 or 14 years old. And that runs in the family. We have bad teeth. But the gums are good, perfect," and a 22-year-old woman who said, "I would rate it very good because I've had maintenance done every year and because I had orthodontics. My gums, probably not so good because I don't floss regularly." Surprisingly, these divergent ratings of different mouth parts did not seem to pose any problem for the respondents; they were still able to provide an overall or summary rating.

Coding and Quantitative Analysis of the Accounts. These reproduced extracts encompass many of the features of the participants' accounts of why they rated their oral health in the way that they did, and many, but not all, of the referents used to construct those accounts. In order to represent the full range of referents and incorporate other issues such as the presence or absence of various attributes and behaviors and references to the past and the present, 64 initial codes were required. These were collapsed into 13 intermediate categories and then into six final or summary categories.

For example, six of the initial codes/descriptors referred to tooth loss or tooth retention: "No missing teeth," "Have all my teeth," "Lots of missing teeth," "Few remaining teeth," "No teeth taken out for long period of time," "Lots of teeth extracted in the past." These were distinguished at the initial coding stage because they all expressed tooth loss/retention in subtly different ways. At the intermediate stage, they were collapsed into one category termed "Tooth loss/retention" and, at the final stage, combined with an additional category "Wears dentures" to give the final summary category "Tooth loss/denture wearing." Clearly, this coding process, necessary to present the

Table 2
Intermediate and Summary Codes and Descriptors and Their Distributions

Summary codes/descriptors	%	Intermediate codes/descriptors	%	Number of initial codes
1. Self-care/health behaviors	51.2	1. Oral self-care	31.6	6
		2. Other health behaviors	5.0	3
		3. Dental visiting	33.8	3
2. Dental problems/dental treatment history	58.7	4. Current dental problems	37.5	16
		5. Current treatment needs	12.5	5
		6. Treatment history	25.0	8
3. Pain/other outcomes	16.3	7. Oral pain/discomfort	13.8	6
		8. Other outcomes	3.8	4
4. Quality of care/professional opinion	12.5	9. Quality of dental care	2.5	2
		10. Professional opinion	10.0	1
5. Tooth loss/denture wearing	25.2	11. Tooth loss/retention	18.0	6
		12. Denture wearing	7.5	2
6. Social comparisons	6.3	13. Social comparisons	6.3	3

content of the accounts and to enable quantitative analysis, inevitably leads to the reduction of the data and the progressive loss of information.

Table 2 shows the intermediate and final categories of referents and the percent of participants invoking the referents contained within the collapsed categories. The column on the right indicates the number of initial codes from which each of the intermediate and summary categories was constructed. The column percentages exceed 100 percent because of the use of multiple referents. Table 3 provides examples taken from the transcripts, which further illustrate each of the 13 intermediate categories.

The data in Table 2 indicate that, in justifying oral health ratings, biomedical and biophysical concerns predominate, with 57.8 percent citing the presence or absence of dental problems in the form of symptoms such as swollen or bleeding gums, the presence or absence of current treatment needs, and treatment histories. With respect to the latter, some reported extensive treatment over the life course, while others commented on how little treatment they had required. Tooth loss/ retention and denture wearing were invoked by 25.2 percent. As noted, this category referred to numbers of teeth lost or retained, time since the last tooth extraction, and having or

having not to wear dentures. When these two categories were combined, 71.2 percent made reference to biomedical/biophysical issues. Oral hygiene practices such as brushing, flossing, and interdental cleaning, other health behaviors such as smoking and diet, and dental visiting patterns were the next most common referent with 51.2 percent including these concerns in their explanations of their ratings. As with studies of general health, some reported positive and some negative health behaviors. The presence or absence of pain was mentioned by just over 1 in 10, but the functional and psychosocial issues that figure prominently in contemporary professional definitions of oral health and measures of oral-health-related quality of life were almost entirely absent, being mentioned by only three participants. These outcomes involved chewing, being self-conscious, and worrying about oral health. Professionally linked referents such as the opinions of dental health professionals and the quality of dental care received in the past were mentioned by just over 10 percent. The social comparisons that often form the basis for evaluations of self-rated general health (1) were used as a referent by only five subjects who referred to their age, specific individuals, or nonspecified generalized others in formulating their ratings. The last included reference to them-

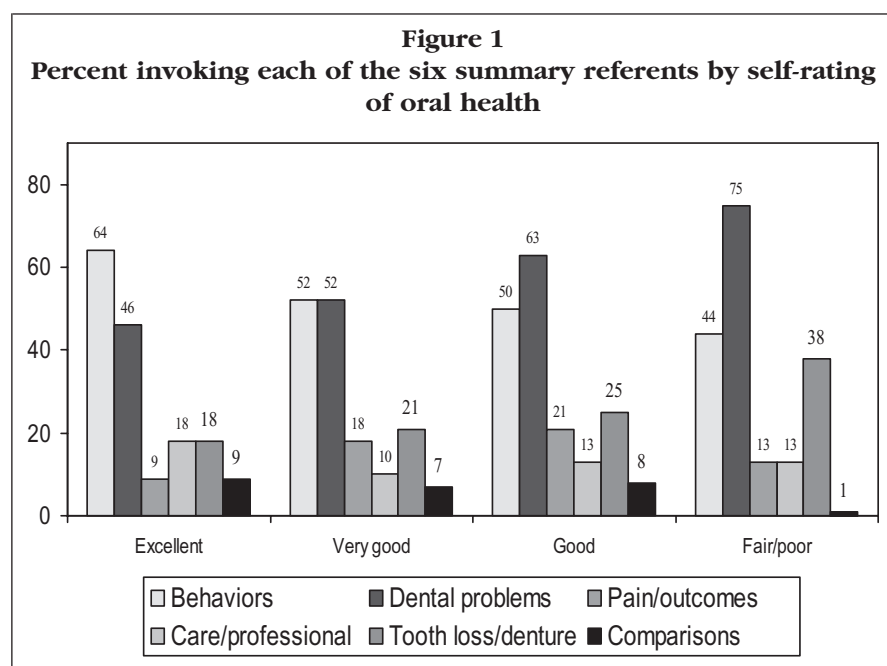selves as "average" in terms of disease experience or oral health behaviors.

Variations in the Accounts and Referents by Participant Characteristics. Table 4 and Figure 1 show differences in the use of referents by participant characteristics. The only difference by gender was that women were more likely than men to use tooth loss and denture wearing as frames of reference. However, because most of those in the older age group were women, this may be an age rather than a gender effect. With respect to age, younger participants were more likely than the older age group to refer to self-care and other health behaviors and to dental problems, needs, and treatment histories, while older ones were more likely to invoke tooth loss and denture wearing. A similar pattern was observed by education; the better educated were more likely than those with lower levels of education to include dental problems in their accounts and less likely to refer to tooth loss and denture wearing. Tooth loss and denture wearing were more likely to be used as referents by those born outside of Canada. However, this group was less likely to refer to pain and other outcomes than the Canadian-born. Again, these differences may be confounded by age. It may be that there are interaction effects operating here, such as an age–gender

Table 3
Examples of Comments Falling into Each of the Intermediate Categories

Intermediate codes/descriptors	Examples
1. Oral self-care	"Its excellent. I take extremely good care of my teeth . . . daily brushing more than once a day after every meal, flossing, gum stimulation with the little feathered tooth picks." (Female, 59, Excellent).
	"The gums are infected. I don't brush enough and I don't floss enough." (Male, 64, Fair).
2. Other health behaviors	"Because of dental care and diet. I don't eat a lot of sweet things and I have in my diet vitamins, minerals, calcium drink milk and lots of fruit and cheese. I feel I eat extremely well." (Male, 54, Very good).
	"It could be better. I drink coffee and tea and I smoke sometimes so it could be better." (Female, 29, Good).
3. Dental visiting	"I've always gone to the dentist for my regular check-ups. I used to go every six months and now at least every nine months I go, so I pretty much take care of my teeth." (Female, 29, Excellent).
	"Back home I used to go all the time to the dentist and take care of my teeth and since I came here because of the expense I couldn't do it." (Female, 50, Fair).
4. Current dental problems	"Well uh, when I go for my check up I guess its you know I seldom have pain in my mouth, I seldom have problems with teeth being loose or just any general problems, gums are good, haven't had a cavity in years." (Male, 36, Excellent).
	"Like my whole mouth including the teeth and gums . . . cause the gums they need some attention. I have receding gums and then there's stress. They say if you have been leading a very stressful life the gums recede . . . um, I grind my teeth." (Female, 45, Fair).
5. Current treatment needs	"I have some teeth that needs . . . some cavities that need to be fixed. I know because I haven't been to the dentist in almost three years." (Male, 40, Fair).
	"Because there is one tooth that needs to be taken out but I don't do it because there's a bridge over it. Its not bothering me but it will in a few months time. And another one needs a root canal." (Female, 58, Fair).
6. Treatment history	"I haven't had a cavity or a filling in my 37 years of life just my wisdom teeth were removed when I was eighteen they were impacted." (Male, 37, Excellent).
	"Partly because I have no cavities, I have all my teeth, I haven't had to have any sort of major dental correction either from braces or anything else, any kind of intervention recently. Based on that I would say very good." (M, 30, Very good).
7. Oral pain or discomfort	"I never have discomfort because of cavities or anything like that." (M, 30, Very good).
	"I have occasional pain in my teeth. I don't know what it is. They don't feel right, they feel as if they are just tight." (Male, 50, Good).
8. Other outcomes	"You hear people having problems with their teeth you know they worry about cavities and stuff and I don't worry about that." (Male, 47, Very Good).
	"I'm a little self-conscious because people are so into their teeth. I mean, like, people my age have these perfect teeth." (Female, 45, Fair).
9. Quality of dental care	"Its very good because I think I had good dental care as a child." (Female, 26, Very good).
	"Well, my dentist was very good at fixing my teeth." (Female, 75, Very good).
10. Professional opinion	"I had my annual check up and the doctor says your mouth is very good, most people aren't that good." (Male, 77, Good).
	"Cause my dentist says I got to watch it . . . the gums are getting infected." (Male, 66, Fair).
11. Tooth loss/retention	"I have got dentures but I haven't lost a tooth now for like thirty years." (Female, 80, Excellent).
	"I have all my own teeth. When I was a kid I had extractions to make room for teeth but that's all." (Male, 58, Good).
12. Denture wearing	"Maybe just good because I have false teeth on top and a partial plate on the bottom. I've only got four of my own teeth." (Female, 84, Good)).
	Because I have dentures and my gums are rather sensitive." (Male, 80, Poor).
13. Social comparisons	"Because if you look at people going on 80 I would say eighty percent don't have their own teeth so I am above normal since I have my own teeth." (Male, 80, Very good)
	"So now I'm 72 years old. For my age I never have a gum problem." (Female, 72, Very good).

Table 4
Percent Invoking Each Referent by Participant Characteristics

	Self-care/health behaviors	Dental problems/dental treatment history	Pain/other outcomes	Quality of care/professional opinion	Tooth loss/denture wearing	Social/temporal comparisons
Gender						
Male	55.6	52.8	19.4	13.9	11.1	5.6
Female	47.7	63.6	13.6	11.4	36.4	6.8
Age						
<39	64.3	64.3	10.7	17.9	7.1	3.6
40-64	50.0	70.0	20.0	10.0	10.0	3.3
65+	36.4	36.4	18.2	8.1	68.2	13.3
Education						
High school or less	41.2	29.4	17.6	5.9	64.7	5.9
Some college or university	60.0	55.2	20.0	10.0	10.0	5.0
Completed college or university	51.2	72.1	14.0	16.3	16.3	7.0
Place of birth						
Canada	49.0	62.7	21.6	11.8	19.6	7.8
Elsewhere	55.2	51.7	6.9	13.8	34.5	3.4

Figure 1
Percent invoking each of the six summary referents by self-rating of oral health

interaction, but the sample size was too small to allow for examination of this possibility.

The data presented in Figure 1 suggest that there are differences in the referents used according to the category of the self-rating of oral health. Those rating their oral health as "excellent" were more likely to invoke health behaviors, and there is also some indication that they were less likely to refer to pain. Those rating their oral health as only "fair" or "poor" were more likely to base their responses on dental problems, treatment needs, and histories and tooth loss and denture wearing. However, perhaps the most interesting observation here is that, irrespective of the category of the self-rating given, all six of the major referents were used by some participants to support their depiction of their oral health.

However, the relationships between the categories of the self-ratings and the referents used were more complex than they might seem, this complexity being masked by the coding and data-reduction process. This can be illustrated with data pertaining to tooth loss/retention and denture wearing, referents used largely but not exclusively by older participants. As might be expected, having retained most of the natural teeth, not having had an extraction for a significant period of time, and not having to wear dentures were often the basis for participants' assigning a rating of "very good" or "good." An 80-year-old woman, rating her oral health as "very good" (Interview 31), said, "Well, I still have all my teeth," and an 80-year-old man said, "I would say very good. I have my own teeth . . . all of them."

Also as expected, having lost many teeth and having to wear dentures provided the basis for oral health ratings of "fair" or "poor":

Interview 57: Female aged 72. Rating: Fair
Interviewer: Now could you tell me why do you give it a fair?
Participant: Because I don't have any teeth up here . . .
Interviewer: No teeth on the upper?
Participant: And I've got a permanent bridge in the front, these three teeth, two caps and one bridge.

Interview 17: Female aged 89. Rating: Fair

Interviewer: But how would you rate it?

Participant: How would I rate it now I've got the dentures . . . I would say fair.

However, tooth loss and denture wearing did not invariably lead to negative oral health ratings. A 94-year-old woman (Interview 65) rated her oral health as "very good" despite having worn full denture for 40 years: "I mean, I have dentures . . . top and bottom. But I can chew everything."

Similarly, a 74-year-old man (Interview 3) also rated his oral health as "very good" even though he had full dentures. As he explained, these represented freedom from a long history of pain and other problems associated with the natural dentition.

Interviewer: Why did you end up with dentures?

Participant: I always had teeth trouble. I had very soft teeth according to what the dentist . . . told me. So I got cavities very easily and it really hurt. I mean . . . I had pain . . . sometimes that was unreal.

Interviewer: It was a mutual decision between you and the dentist?

Participant: At the time I don't think we talked about it. It was my decision because you get sick of toothaches. I said you might as well give me full mouth. . . .

Interviewer: How do you feel about that decision now?

Participant: Okay . . . because when I had partials and had some bad teeth sometimes I didn't like to smile because a broken tooth would show or something like that so I actually felt better about myself.

The participant in Interview 58 (male aged 73) rated his oral health as "very good" in spite of only having six remaining teeth, wearing bridges and a full upper denture, and having to be careful about eating foods such as apples.

Interviewer: What makes it very good?

Participant: Well, I look after it and I go to the dentist every six months. I don't have many teeth left but what I do have I take care of. The dentist says to look after them because it's very hard to have a bottom plate.

For these participants, definitions of good oral health were not based on the physical state of the mouth but on other considerations such as functioning, pain, and feeling better about oneself. For participant 58, "taking good care" of the few remaining teeth that he had and following professional advice were sufficient to warrant his oral health as being "very good." These data fragments indicate a general process observed in the data. That is, favorable ratings of oral health can be maintained even in the presence of negative attributes and behaviors.

Discussion and Implications. The results of this preliminary study broadly agree with studies of general health ratings. That is, the meaning of oral health varies with different frames of reference being used by participants when rating their oral health. Notwithstanding this variation, biomedical issues, including dental diseases, diagnoses, treatment histories, and tooth loss, were the most prominent, referred to by almost three-quarters of the sample. Consequently, the results of the study are consistent with those of Manderbacka (14) who concluded that "the medical model is a predominant cultural model of health and thus a meaningful choice (i.e., frame of reference) for the respondents when asked to describe or assess their health in the interview situation." However, for some of her respondents, the concept of health underlying health ratings was broadened when they referred to health behaviors and issues of individual responsibility and lifestyle. This broader concept was much more prominent in the accounts of oral health col-

lected here than those reported by studies of the meaning of general health ratings, with self-care activities, other health behaviors such as smoking and dental visiting patterns being mentioned by more than half. The content of the accounts consisting of such matters suggests that professional ideologies and values concerning appropriate behaviors, such as brushing and flossing twice a day and regular preventive dental visits, also provide a language and frame of reference that people can use to give meaning to their oral health ratings. Interestingly, the participants in the study who used such referents were not saying that their oral health was good *because* they acted appropriately; rather, such actions were *in and of themselves* indicators of good oral health. As Kaplan and Baron-Epel (1) state, "Health is a social construction and our beliefs and conceptions are rooted in wider socio-cultural contexts (and) influenced by biomedicine and prevailing social and medical ideologies." Our data suggest that this is the case for oral health as well as general health.

A further similarity between this study and studies of general health ratings was that many of the accounts were complex and used multiple referents that were sometimes inconsistent and contradictory. That is, some who rated their oral health favorably referred to negative attributes or behaviors, while some who rated their oral health unfavorably made reference to positive attributes and behaviors. In addition, some participants differentiated between adjacent categories of the self-rating and explained why they rated their oral health as "very good" rather than "excellent," a finding previously reported by Kaplan and Baron-Epel (1). This suggests that responses to the self-rated oral health question are not *ad hoc* or arbitrary and, although spontaneous, are the product of a process involving judgment and consideration of multiple experiences pertaining to the present and past.

One notable feature of the accounts offered by the participants and one way in which accounts of oral and general health appear to differ was that the functional and psychosocial outcomes that form the basis of contemporary definitions of oral health were largely absent. This may mean that the more inclusive concept of oral health that is a feature of much contemporary discourse may be a professional construction that is not recognized or used as a frame of reference to any great extent by the lay population. Alternately, it may be because the participants in the study were recruited from community rather than from clinical settings and, because most rated their oral health as "good," they may not have been experiencing many of the impacts captured by measures of "oral health-related quality of life" at the time of the interview. Similar studies of individuals actively seeking dental care for oral health problems would be useful in determining whether or not this is the case and whether in lay discourse oral health, as a bio-medical construct, is distinct from "oral health-related quality of life" considerations. Such considerations did emerge when participants were questioned about how oral health diminished or enhanced their quality of life, although this was usually in a hypothetical sense rather than a product of their own experience. At a minimum, this suggests that what is being captured by self-ratings of oral health differs from what is being measured by scales such as the Oral Health Impact Profile (21), so that these single-item self-ratings should not be used as a substitute for multi-item scales. Certainly, this contrasts with quantitative work we have undertaken where a number of Oral Health Impact Profile subscales emerged as significant predictors of self-ratings of oral health (12).

It is also possible that the content of the participants' accounts could be an artifact of the interview process. That is, because the participants knew that they were part of a study of oral health being conducted by university-based dental researchers, they may have selected frames of references consistent with their assumptions about the intentions and interests of those conducting the study. This highlights the fact that qualitative interviews do not simply reveal respondents' meanings; rather, the interview is a social encounter and a context within which such meanings are constructed and negotiated (22). That is, "people's views not only vary because of where and who they are, they may vary because of the purpose of the account they are giving and how they are asked about their views" (23). This may be what Manderbacka (14) and Jylha (15) mean when they refer to concepts of health as "context bound."

Consistent with the studies of ratings of general health, there was some variation in the referents used according to sociodemographic characteristics. If the 15 percent rule of thumb for defining differences is accepted, the main variation was with respect to age. Older subjects were more likely to refer to tooth loss/retention and denture wearing, while younger subjects more often referred to health behaviors and dental problems. While differences were noted with respect to other sociodemographic variables, these may have been confounded by age. However, comparisons with other studies require caution because, in their analyses, each subject was given a single code rather then the multiple codes we used in an attempt to preserve as far as possible the complexity of many of the accounts.

There was also evidence of variation in referents within the categories of the self-rating. Those who rated their oral health as "excellent" were more likely to refer to health behaviors, while those rating it unfavorably were more like to invoke dental problems and treatments and tooth loss. These, along with the differences according to sociodemographic variables, may reflect differences in the oral health status and oral health experiences of those rating their health in different ways and are to some extent predictable (10). However, there were some instances where participants rated their oral health as "good" even though, from a normative/professional perspective, their oral health would be considered to be "poor." This was most notable with respect to tooth loss. Here, a positive evaluation was constructed and maintained by situating tooth loss within a broader context consisting of multiple referents so that the physical state of the mouth was not the criterion on which the self-rating was based. Idler *et al.* (13) consider that such cases provide evidence of "active selves creating meaning, choosing points of view and rejecting others." This, they claim, supports previous studies that show that participants "pick and choose their frames of reference and sources of comparison with respect to health" consistent with their interests at hand. Given the relatively small sample size of our study, these findings and interpretations, while not unreasonable, are only tentative.

Perhaps the most interesting observation arising from the quantitative analysis was that within each of the categories of the self-rating, all of the six major types of referents were used. This helps to explain why correlations between variables such as tooth loss and self-ratings of oral health tend to be weak and why the explanatory power of regressions models predicting the self-ratings is low (11,12). Moreover, and perhaps of most significance, is the fact that, even when respondents choose the same response option, their responses are not necessarily equivalent in terms of meaning. The meaning of excellent oral health and indicators of excellent oral health, for example, differ from one person to another. As Mallinson (23) has suggested, this challenges a basic premise of survey research:

> While psychometric assessments have a role to play in developing health questionnaires, they shed little light on the meaning of the questions and response options to respondents and, therefore, the

meaning of their answers. Yet the validity of survey data depends upon shared meanings.

She continues:

> The issue of meaning is absolutely central to understanding subjective views and without more assessment of peoples' understandings of survey questions it is difficult to see how one can establish their validity as subjective health measures.

Consequently, single-item global ratings may not fully capture subjective perceptions of oral health; rather, the response option chosen merely indicates the label people use to summarize those perceptions. Further qualitative work around this issue is warranted to allow for a fuller appreciate of what survey questions actually measure and what this implies with respect to quantitative research (24).

Although the findings of this study are of some interest, the study itself is not without limitations. In common with most qualitative studies, the sample was small and not selected at random so that generalizing the findings is problematic. Moreover, because the participants in the study were a convenience sample, inferential statistical tests were not used, and the interpretation of the data regarding variations in the use of referents by subgroups required the use of a rule of thumb for determining whether the subgroups did differ in this regard. Further, the coding and reduction of the data necessary for the reporting of the results and quantitative analysis masked much of the complexity and variation in participants' accounts. For example, participants who referred to a history of extensive dental treatment over the life course were given the same intermediate code as those who commented on how little treatment they had received. Keeping these referents distinct might have provided better insight into variations in referents by

participant characteristics (10). Further, it meant that the six summary variables used in the quantitative analysis were not homogenous as we would have liked, which might have masked as much as they revealed. It is this illusion of homogeneity that Mallinson (21) refers to in her concerns regarding survey questions and responses. These problems can only be overcome by the collection of similar data from much larger, randomly selected samples that allow for the creation of less heterogeneous categories. Finally, we did not collect clinical data so were not able to relate participants' accounts and the referents they contained to their clinical oral status. This is a shortcoming of many studies of this type (13). Consequently, the study represents a first step in the process of uncovering the various meanings that underlie self-ratings of oral health and will stimulate further qualitative research on survey participants' understandings of and responses to questions commonly used to assess self-perceived oral health.

Acknowledgments

References

1. Kaplan G, Baron-Epel O. What lies behind the subjective evaluation of health status? Soc Sci Med. 2003;56:1669-76.
2. Rowan W. Global questions and scores. In: Jenkinson C, editor. Measuring health and medical outcomes. London: UCL Press Ltd; 1994. p. 45-61.
3. Idler E, Benyamini Y. Self-rated health and mortality: a review of twenty-seven community studies. J Health Soc Behav. 1997;38:21-37.
4. Shadbolt B, Barresi J, Craft P. Self-rated health as a predictor of survival among patients with advanced cancer. J Clin Oncol. 2002;20:2514-9.
5. Evashwick C, Rowe G, Diehr P, Branch L. Factors explaining the use of health care services by the elderly. Health Serv Res. 1984;19:357-82.
6. Benyamini Y, Leventhal H, Leventhal E. Self-rated oral health as an independent predictor of self-rated general health, self-esteem and life satisfaction. Soc Sci Med. 2004;59:1109-16.
7. Locker D, Jokovic A. Three-year changes in self-perceived oral health status in an older Canadian population. J Dent Res. 1997;76:1292-7.
8. Locker D, Clarke M, Payne B. Self-perceived oral health status, psychological well-being and life satisfaction in an older adult population. J Dent Res. 2000; 79:970-5.
9. Locker D. Changes in chewing ability with aging: a seven-year study of older adults. J Oral Rehabil. 2002;29:1021-9.
10. Krause N, Jay G. What do global self-rated health items measure? Med Care. 1994;32:930-42.
11. Mozes B, Maor Y, Shmueli A. Do we know what global ratings of health-related quality of life measure? Qual Life Res. 1999;8:269-73.
12. Locker D, Wexler E, Jokovic A. What do older adult's global ratings of oral health measure? J Public Health Dent. 2005; 65:146-52.
13. Idler E, Hudson S, Leventhal H. The meanings of self-rated health: a qualitative and quantitative approach. Res Aging. 1999;21:458-76.
14. Manderbacka K. Examining what self-rated health question is understood to mean by respondents. Scand J Soc Med. 1998;26:145-53.
15. Jylha M. Self-rated health revisited: exploring survey interview episodes with elderly respondents. Soc Sci Med. 1994; 39:983-90.
16. Groves R, Fultz N, Martin E. Direct questioning about comprehension in a survey setting. In: Tanur J, editor. Questions about questions: inquiries into the cognitive bases of surveys. New York: Russell Sage; 1992. p. 121-36.
17. MacEntee M, Hole R, Stolar E. The significance of the mouth in old age. Soc Sci Med. 1997;45:1449-58.
18. Gregory J, Gibson B, Robinson PG. The relevance of oral health for attenders and non-attenders: a qualitative study. Br Dent J. 2007;202:E18.
19. Dong M, Loignon C, Levine A, Bedos C. Perceptions of oral illness among Chinese immigrants in Montreal: a qualitative study. J Dent Educ. 2007;71:1340-7.
20. Morse J. The significance of saturation. Qual Health Res. 1995;5:147-9.
21. Slade G, Spencer J. Development and evaluation of the oral health impact profile. Community Dent Health. 1994; 11:3-11.
22. Locker D. Symptoms and illness. The cognitive organization of disorder. London: Tavistock Publications; 1981.
23. Mallinson S. Listening to respondents: a qualitative assessment of the Short-Form 36 Health Status Questionnaire. Soc Sci Med. 2002;54:11-21.
24. Gooberman-Hill R, Ayis S, Ebrahim S. Understanding long-standing illness among older people. Soc Sci Med. 2003; 2555-64.