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# Towards a greater understanding of the experience of stroke: Integrating quantitative and qualitative methods

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## Abstract

This article reports on a study that uses both quantitative and qualitative methodological strategies to understand well-being following a stroke in later life. A quantitative approach is taken with a national survey of Canadian seniors to describe the patterns and correlates of well-being following stroke. Qualitative methods are then used in a separate sample of community dwelling stroke survivors to gain a greater understanding of the underlying meaning and processes by which a stroke affects well-being in later life. Integrated findings illustrate that physical and cognitive disabilities considerably limit the well-being of stroke survivors, largely due to the effects of disability on identity. Statistical interaction effects in the quantitative data indicate that social supports and educational resources moderate the adverse effects of physical disability on well-being. The qualitative accounts provide further insight into the dynamics of this buffering process. Together, both methods permit a more comprehensive understanding of subjective well-being following stroke.

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*Keywords:* Stroke; Quantitative and qualitative methods; Physical and cognitive disabilities

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## 1. Introduction

A stroke can be a serious and debilitating chronic health problem and is more likely to occur in later life. Survivors may suddenly be left with paralysis or weakness in their arms or legs, memory problems, visual impairment, loss of sensation in or awareness of

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one side of the body, difficulty swallowing, and difficulty in understanding what is said and in communicating with others. These residual impairments and disabilities can pose a significant problem for the well-being of older adults (Ahlsio, Britton, Murray, & Theorell, 1984; Astrom, Asplund, & Astrom, 1992; Clarke, Black, Badley, Lawrence, & Williams, 1999; Clarke, Lawrence, & Black, 2000; Kim, Warren, Madill, & Hadley, 1999; King, 1996), yet, the resulting physical sequelae are not necessarily correlated with subjective well-being (Labi, Phillips, & Gresham, 1980; Radomski, 1995). Some individuals appear to be able to adapt to their residual disabilities and impairments in order to maintain some sense of satisfaction with their post-stroke lives, while others are devastated by minor sequelae. In their review of patient outcomes following illness, Wilson and Cleary (1995) suggest that there is not a direct one-to-one correlation between severity of functional limitations and well-being. Yet, little is understood about the process by which individuals maintain (or lose) a positive sense of well-being in the face of a chronic disabling condition.

Using both quantitative and qualitative methods, the purpose of this study is to investigate the factors influencing subjective well-being following stroke. A quantitative approach is taken with a national survey of Canadian seniors to describe the patterns and correlates of well-being following a stroke. Qualitative methods are then used in a separate sample of community dwelling stroke survivors to gain a greater understanding of the underlying meaning and processes by which a stroke affects well-being in later life.

## **2. Background**

The use of both quantitative and qualitative strategies in a single research project has been a subject of considerable controversy, and still remains a largely uncommon practice in the study of health and illness. For instance, in a review of MEDLINE citations between 1993 and 1997, Casebeer and Verhoef (1997) found that only 13 of the 464 papers on chronic diseases could be classified as “combined methods” studies. The methodological separation of quantitative and qualitative methodologies stems from the perception that each method adheres to a different epistemological paradigm (see Bryman, 1984, 1988; Haase & Myers, 1988; Howe, 1985, 1988). According to this view, quantitative research falls within a positivist paradigm, which assumes that the world around us is generally stable and predictable, conforming to common norms and patterns. Qualitative research, on the other hand, is thought by some to fall within the interpretive paradigm, which assumes that the world is in a dynamic state of flux, with multiple subjective realities. Consequently, quantitative strategies are seen by some as appropriate for deductive explanatory analysis under standardized, objective conditions, while qualitative techniques are used to explore research questions inductively in uncontrolled natural contexts.

However, Bryman (1988) questions whether the bond between epistemology and method is exaggerated, and Howe (1985, 1988) even argues that the quantitative–

qualitative debate is itself a function of positivistic presuppositions.<sup>1</sup> Haase and Myers (1988, p. 132) maintain that “both views of the nature of reality are compatible and essential to understand the human experience.” While multiple meanings can be derived from similar experiences, experiences can also be grouped “in order to have general principles from which to make sense of the world” (Haase & Myers, 1988, p. 132).

This approach coincides with my own ontological and epistemological perspective that reality is something that can be measured and generalized, and also something that is unique to each individual. By approaching the study of well-being following stroke from both philosophical perspectives, a greater depth of knowledge can be obtained about the stroke experience. As Bryman (1988, p. 126) concludes, “when quantitative and qualitative research are jointly pursued, much more complete accounts of social reality can ensue.”

### 3. Methods

There are many ways in which quantitative and qualitative methodological strategies can be integrated, but one of the most common purposes of mixed-method studies is triangulation (Denzin, 1978), where results from different methods are used to enhance the validity of the findings. In this process, triangulation can be used to corroborate (Rossman & Wilson, 1985) or seek convergence (Mark & Shotland, 1987) in findings across methods. The findings from one method can also be used to elaborate on (Rossman & Wilson, 1985) or complement (Greene, Caracelli, & Graham, 1989) the findings from another method. In this study, mixed methods are used primarily for the purposes of elaboration. Quantitative methods are used first, in order to identify the patterns and correlates of well-being following stroke, followed by a qualitative component, which seeks to better explain the underlying reasons for the observed patterns.

#### 3.1. *Methods for quantitative component*

This section describes the methodology for the quantitative component of the study. Methodology for the qualitative component is outlined in a section following the quantitative results, since the general direction of the qualitative component is guided by the findings from the quantitative analyses.

Secondary analyses were conducted with data from the second wave of the Canadian Study of Health and Aging (CSHA), as described in more detail elsewhere (Clarke, Marshall, Black, & Colantonio, 2002). The first wave of the study (CSHA-1) began in 1991 with a representative sample of community ( $n=9008$ ) and institutional ( $n=1255$ ) dwelling Cana-

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<sup>1</sup> Along with a growing number of other pragmatists, Howe (1985, p. 17) argues that “the perception of a forced choice between value-laden, qualitative methods and descriptive, quantitative methods results from uncritical acceptance of positivistic epistemology.” Howe’s postpositivist position follows that of the philosopher Willard Quine (1951), who first rejected the positivist notion that there is a precise relationship between empirical evidence and corresponding laws and theories. Rather, all knowledge is seen as theory-laden and not neatly divisible according to the fact-value dogma.

dians age 65 years and older. A second wave of the study (CSHA-2) was conducted 4 years later (1995–1996) when surviving subjects from the first wave were recontacted for follow-up. A more detailed summary of subject selection and sampling procedures is reported elsewhere (CSHA, 1994).

Of the original community sample of 9008 seniors, 5395 (59.9%) community dwelling seniors were interviewed at CSHA-2, while 3613 (40.1%) did not participate for various reasons: 1867 (20.7%) died between the two waves of the study, 308 (3.4%) had moved to an institutional setting; 402 (4.5%) were diagnosed with dementia, 587 (6.5%) refused, 251 (2.8%) could not be contacted, and 198 (2.2%) were unable to participate because of severe cognitive problems.

### 3.2. Measures

The Ryff Measure of Psychological Well-Being (Ryff, 1989) was included in CSHA-2. This self-report measure taps six core theoretical dimensions of well-being that are common to the mental health, clinical, and life span developmental theories of positive psychological functioning. These six dimensions are *self-acceptance*, or positive attitudes toward oneself; *autonomy*, including qualities of self-determination and independence; *environmental mastery*, which is the individual's ability to engage in, and manage, activities in one's surrounding world; *purpose in life*, including the feeling that there is purpose in and meaning to life; *personal growth*, which represents one's continual development and striving to realize one's potential; and *positive relations with others*, which includes the ability to engage in close relationships with others.

The original measure consists of 120 items (Ryff, 1989), but due to the time and cost restrictions of a national survey, the shorter 18-item version was included in CSHA-2, which includes three items for each of the six dimensions of well-being (Ryff & Keyes, 1995). Respondents rate themselves on each item according to a six-point scale ranging from *strongly agree* to *strongly disagree*. Items are divided between positively and negatively phrased items, with reverse scoring performed for the negatively phrased items so that greater agreement with items results in a higher score. The measure has also been used in a number of national surveys in the United States and has demonstrated reliability and validity (Clarke, Marshall, Ryff, & Wheaton, 2001; Ryff, 1989; Ryff & Keyes, 1995).

Apart from the Ryff measures of well-being, information on demographic, health, and socioeconomic factors was also collected in CSHA-2. Information on whether a person had experienced a stroke was collected through the self-report question: "Have you experienced a stroke or the effects of a stroke in the previous year?" Seniors were also asked about the occurrence of a further 16 common health problems in the previous year. Cognitive function was assessed with the Modified Mini-Mental State Examination (3MS) (Teng & Chui, 1987), which ranges from 0 to 100 with a high score indicating higher cognitive function. Self-rated health was assessed with the question "How is your health these days?," which respondents answered on a five-point scale (very good, pretty good, not too good, poor, very poor). Functional ability was assessed through a measure of activities of daily living (ADL) (Fillenbaum, 1988). Seven questions probe independence in basic self-care ADLs and a

further seven items probe independence in more complex instrumental ADLs (IADL); a high score indicates greater independence.

Respondents were asked about their educational level (in years of completed education) and annual household income, which was documented according to 12 ordinal \$5000 income categories. Respondents were also asked about the size of their social network (the number of people they can count on for general help and support). Satisfaction with social support was assessed with the question “Do you ever feel that you need more support?” The responses “often” and “sometimes” were collapsed to indicate dissatisfaction with social support, while the response “never” indicates satisfaction with social support.

### *3.3. Statistical analyses*

Descriptive statistics are first used to summarize the characteristics of Canadian stroke survivors living in the community. Multiple regression is then used to determine the relationships between well-being and the various demographic, health, and socioeconomic variables in stroke survivors, paying attention to possible confounding and interaction effects between variables. All statistical analyses are performed using the Statistical Analysis System (SAS) Version 8 for Windows. All analyses use weighted data to correct for the over sampling of the original CSHA-1 sample by age and region of Canada.

## **4. Results for quantitative component**

### *4.1. Descriptive statistics*

Of the total sample of 5395 community dwelling seniors at CSHA-2, 339 (6.3%) reported experiencing a stroke or the effects of a stroke in the previous year. Of these 339 stroke survivors, 282 (83.2%) have complete data on at least one of the Ryff measures of well-being, while 57 (16.8%) have no well-being data, largely due to the presence of severe cognitive problems that prevented the completion of the questionnaire. The focus of this research is therefore limited to community dwelling stroke survivors without severe cognitive impairment. [Table 1](#) summarizes the sociodemographic and health characteristics of these 282 stroke survivors.

### *4.2. Multiple regression results for stroke survivors*

[Table 2](#) reports the results of the multiple regression models for five of the six dimensions of well-being in stroke survivors. No statistically significant effects were found for the dimension of autonomy. All models control for age and gender, as well as the number of comorbid health conditions in order to better isolate the effects of stroke on well-being apart from the effects of other health conditions. (These control variables are only displayed in [Table 2](#) if they are statistically significant.) As is usual in survey-based research, participant nonresponse produces slightly varying numbers of cases in different models.

Table 1  
Sociodemographic and health characteristics of community-dwelling stroke survivors from CSHA-2

Age (years $\pm$ S.D.), $n = 282$	75.9 $\pm$ 5.1
Gender (%), $n = 282$	
Male	46.2
Female	53.8
Education (years $\pm$ S.D.), $n = 281$	10.4 $\pm$ 3.3
Household income (%), $n = 212$	
Less than \$25,000	48.1
\$25,000–49,999	36.0
\$50,000 or more	15.9
Self-reported health status (%), $n = 282$	
Very good	8.0
Pretty good	55.3
Not too good	30.3
Poor	4.0
Very poor	2.3
Number of comorbid health conditions ( $\pm$ S.D.), $n = 272$	5.2 $\pm$ 2.3
Cognitive function (3MS $\pm$ S.D.), $n = 282$	87.5 $\pm$ 8.4
Functional status	
Basic self-care ADL ( $\pm$ S.D.), $n = 281$	13.2 $\pm$ 1.5
Instrumental ADL ( $\pm$ S.D.), $n = 276$	11.9 $\pm$ 2.6
Social support	
Network size ( $\pm$ S.D.), $n = 280$	3.7 $\pm$ 2.4
% Dissatisfied with support, $n = 282$	32.2

Unequal  $n$  because of missing values.

Physical and cognitive disability were repeatedly associated with a lower sense of well-being following stroke. When controlling for age, gender, and the number of comorbid health conditions, stroke survivors requiring greater assistance with instrumental ADLs reported a significantly lower level of well-being than those survivors who were functionally independent, in terms of their sense of personal growth, environmental mastery, and positive relations with others. (Functional ability in more basic self-care ADLs was not related to well-being in this sample.) Similarly, survivors with lower scores on the cognitive impairment measure reported a lower sense of purpose in life than those with higher cognitive function. Poorer self-rated health and a greater number of comorbid health conditions were also associated with a decreased sense of environmental mastery and self-acceptance.

While physical and cognitive function were associated with a lower sense of well-being following stroke, social resources were associated with a higher sense of well-being. Stroke survivors with a larger social support network perceived greater opportunities for personal growth and reported more positive relationships with others. Moreover, in comparison to stroke survivors who perceive their supports to be inadequate, survivors who expressed satisfaction with their social supports reported higher scores on the environmental mastery, positive relations, and self-acceptance dimensions of well-being. In terms of socioeconomic resources, survivors with a greater number of years of education reported a greater sense of personal growth, purpose in life, and environmental mastery than survivors with fewer

Table 2  
Factors associated with dimensions of well-being in stroke survivors

Well-being dimension	Parameter estimate (S.E.)
Personal growth ( <i>n</i> = 233)	$R^2 = .13$
Intercept	7.36 (2.49) *
Independence in IADL	0.18 (0.06) *
Education	0.13 (0.04) *
Network size	0.15 (0.06) *
Purpose in life ( <i>n</i> = 259)	$R^2 = .17$
Intercept	- 0.23 (2.99)
Cognitive function	0.07 (0.02) **
Education	0.18 (0.05) **
Environmental mastery ( <i>n</i> = 261)	$R^2 = .41$
Intercept	3.89 (2.54)
Comorbid health conditions	- 0.12 (0.05) *
SRH	0.24 (0.19) **
Independence in IADL	0.57 (0.16) **
Education	0.56 (0.18) **
Support satisfaction	
Satisfied <sup>a</sup>	-
Dissatisfied	- 5.96 (1.34) **
IADL × Support satisfaction	
Satisfied <sup>a</sup>	-
Dissatisfied	0.24 (0.09) *
SRH × Support satisfaction	
Satisfied <sup>a</sup>	-
Dissatisfied	0.71 (0.31) *
IADL × Education	- 0.04 (0.01) *
Positive relations ( <i>n</i> = 252)	$R^2 = .10$
Intercept	6.86 (2.44) **
Independence in IADL	0.18 (0.06) **
Network size	0.14 (0.06) *
Support satisfaction	
Satisfied <sup>a</sup>	-
Dissatisfied	- 0.54 (0.31) *
Self-acceptance ( <i>n</i> = 263)	$R^2 = .08$
Intercept	11.90 (2.16) **
Comorbid health conditions	- 0.13 (0.06) *
Support satisfaction	
Satisfied <sup>a</sup>	-
Dissatisfied	- 1.06 (0.32) **

All models control for age, gender, and the number of comorbid health conditions.

S.E. = standard error of unstandardized regression coefficient; IADL = instrumental activities of daily living; SRH = self-rated health.

<sup>a</sup> Reference category for the corresponding indicator variable.

\*  $P < .05$ .

\*\*  $P < .001$ .



years of education. Household income was not associated with any of the dimensions of well-being.

These social resources actually had a buffering effect in survivors, serving to reduce the adverse effects of physical disability and poor health on subjective well-being following stroke. As indicated in [Table 2](#), three significant linear interaction effects were detected for the dimension of environmental mastery, indicating that the effects of health status and functional disability on well-being vary according to survivors' educational level and degree of satisfaction with their social supports. For stroke survivors who express dissatisfaction with their social supports, disability in instrumental ADLs and a lower self-reported health status have a much greater impact on their sense of mastery and control than for survivors who feel that their supports are adequate. Similarly, the adverse impact of disability in instrumental ADLs on one's sense of mastery or control after a stroke is attenuated in those with a greater number of years of education. Together, these variables explain 41% of the variance in the environmental mastery dimension of well-being.

## **5. Methodology for qualitative component**

The aim of the qualitative component of this study was to illuminate aspects of the stroke experience that were either not covered or were unexplained by the quantitative component. While it would be ideal, for this purpose, to conduct qualitative interviews with individuals from the same sample who participated in the quantitative survey, it was not possible to access the subjects from the CSHA survey for this study. Although differences in the two samples are likely to increase the variability in results, efforts were made in the qualitative sampling procedures to minimize differences in subject characteristics between the two study groups.

Participants were selected from community dwelling stroke survivors who were previously admitted for a stroke at Sunnybrook, and Women's College Health Sciences Centre in Toronto, Canada. The regional catchment area of 250,000 individuals represents approximately 16% of the total Metropolitan Toronto population and is largely middle class with a relatively high proportion of elderly adults of Anglo-Saxon origin. The research was approved by the Research Ethics Board at Sunnybrook and Women's College Health Sciences Centre, and written informed consent was obtained from those persons agreeing to participate.

A total of eight stroke survivors participated in the qualitative component of this study (subject characteristics are described in [Table 3](#)). In keeping with the notion of theoretical sampling ([Glaser & Strauss, 1967](#)), stroke survivors were sampled according to those factors that were identified as important for well-being in the quantitative findings. First, in order to correspond to the demographics of the CSHA sample, study participants were selected from community dwelling stroke survivors at least 60 years of age. Then, because of the repeated importance of physical and cognitive function for well-being that was identified in the quantitative results, subjects were sampled with various levels of residual impairment and disability in order to fully explore the effects of different levels of function on well-being



Table 3  
Descriptive characteristics of subjects in qualitative component

Name <sup>a</sup>	Age	Sex	Date of stroke	Date of interview	Hemisphere and location	Stroke impairment
H.N.	60	male	May 29, 1999	January 13, 2000	right basal ganglia	severe left hemiparesis
N.M.	62	female	September 1993	January 14, 2000	right frontal– temporal–parietal	left hemiparesis; seizures
F.S.	76	female	1991	January 14, 2000	right frontal– temporal–parietal	dense left hemiplegia; marked hemispatial neglect
V.G.	63	male	December 19, 1996	January 17, 2000	right basal ganglia	left hemiplegia; cognitive impairment
E.E.	68	female	April 22, 1991	January 18, 2000	right occipital	problems in face recognition
S.G.	73	female	March 1995	January 19, 2000	right frontal– temporal–parietal	left hemiparesis, dysarthria, left-sided neglect
D.F.	81	male	October 10, 1995	May 11, 2000	right occipital	left-field defect; memory loss
S.N.	89	female	December 5, 1998	May 12, 2000	left occipital	right vision field loss

<sup>a</sup> All identifying initials are pseudonyms.

following stroke. Five of the subjects sampled had a low level of function (difficulty performing ADLs due to marked hemiparesis or hemiplegia; see Table 3), while three subjects were selected because they had a higher level of function (as a result of less severe impairments such as visual field defects or problems in face recognition). However, like the quantitative sample, subjects were not eligible if they had severe cognitive impairments or communication problems (i.e., aphasia) that would limit their ability to reveal their subjective experiences.

Results from the quantitative component also indicated that social supports were important for a number of dimensions of well-being. Consequently, participants were sampled with a range of social supports in order to explore the underlying reasons for the relationship between social resources and well-being. Five subjects were selected with high social supports (they had supportive spouses and family members), while three subjects were sampled with low supports (these individuals were unmarried, widowed, or lived with an unsupportive spouse). Since education was found to be important for a number of dimensions of well-being in the quantitative results, an attempt was also made to recruit participants with a range of socioeconomic resources. However, due to the demographic composition of the sampling area, no stroke survivors could be found of low socioeconomic status. Data are only available, therefore, from survivors of middle class backgrounds.

Qualitative data were collected from stroke survivors using the technique of the “focused interview” (Merton & Kendall, 1945), which is specifically designed to specify the mechanisms or processes underlying a previously observed empirical relationship. An interview guide was developed based on the findings and hypotheses generated during the quantitative component. Using this interview guide, open-ended in-depth interviews were conducted with stroke survivors in their homes at a time that was convenient for them. The

interview guide serves as a rough checklist of points for discussion, but each interview unfolded depending on the particular issues that were raised by each respondent. Interviews usually lasted between 60 and 90 minutes, although some interviews lasted up to 2 1/2 hours. All interviews were audiotaped with the permission of the respondent and were transcribed verbatim.

The analysis of the interviews occurred simultaneously and interactively with the data collection. The first transcripts were coded for concepts or themes (Luborsky, 1994), which were documented in a coding memo (Lofland & Lofland, 1995). In subsequent interviews, attention was paid to the appearance of similar concepts as well as to the emergence of new concepts, continuously making comparisons between the coding scheme and interview transcripts in an iterative process. This resulted in various additions and modifications to the coding memos, and a total of three successive coding memos, documenting 33 codes, was developed over the course of the iterative analytic process. As concepts repeatedly surfaced in the interviews, they were then grouped to form categories or typologies, which over time were related and linked to form a theoretical explanation of the stroke experience. The key linkages between categories were identified by “diagramming” or “charting” (Lofland & Lofland, 1995) in order to structure the evolving analysis. The resulting hypotheses about relationships among categories were continuously developed and verified during the interview process, and the theoretical explanations revised depending on the extent to which the data verified or modified them.

This iterative analytic process continued until no new categories or themes were identified (theoretical saturation of categories). Theoretical saturation occurred when it was no longer necessary to make any modifications to the coding scheme or the analytic diagrams. Also, at this point, I stopped learning anything new in the interviews; they conformed, or fit into, the analytic pattern I had developed without generating any new insight. A series of four separate analytic diagrams, incorporating 13 distinct categories, was developed over the course of the analysis. Respondents were equally distributed within these 13 categories. For instance, within the category “Social Support,” five survivors reported a high level of support, while three reported dissatisfaction with their supports. Similarly, within the category “Disability,” three individuals made reference to the fact that they had relatively minor disabilities, while five people commented extensively about their considerable difficulties with physical function. While other research suggests that between 12 and 20 individuals are needed to achieve maximum variation in experience (Kuzel, 1992, p. 41), the smaller number of subjects interviewed in this study reflects the fact that the qualitative component was a focused investigation of specific aspects of the stroke experience that had previously been identified in the quantitative component.

## **6. Results for qualitative component**

Of the eight stroke survivors interviewed, three were male and five were female. Respondents ranged in age from 60 to 81, with a mean age of 69 years. All survivors were White. Six of the survivors were married, one man was separated, and one woman was

widowed. The separated and widowed survivors lived alone. Six respondents lived in houses (one of which was located in a retirement community), while the other two lived in condominium complexes. Time since stroke for respondents ranged from 7 months to 9 years, with a mean time of 4.8 years. All respondents were experiencing some residual impairment from their stroke and used various assistive devices (canes, walkers, or wheelchairs) to aid in mobility.

All respondents indicated that their life had changed since they had their stroke. Three of the survivors (two women and one man) reported that they used to be very physically active before their stroke, engaging in sports such as running, curling, skiing, and horseback riding, that they could no longer do. However, even less physically vigorous pursuits were restricted after a stroke, since all respondents indicated that they could no longer engage in activities such as gardening, reading, travelling, or volunteering. Six of the survivors could no longer drive.

However, while all survivors recounted the numerous ways that their lives had changed since their stroke, not all survivors demonstrated a decreased sense of well-being. The extent to which a stroke affected the respondents' well-being seemed to depend upon the degree to which their disabilities affected their sense of identity, and also on the successful process of adaptation to their disabilities.

When the residual disabilities following a stroke prevented a person from engaging in activities that constituted an important component of that person's identity, then the well-being of survivors was considerably reduced. The three survivors who had been physically active before their stroke, and defined themselves as physically active, were especially affected by the physical restrictions brought on by their stroke. For example, the physical activities of one 60-year-old man had been an integral component of his identity in his pre-stroke life. He had a very large garden, which he was always working on, he jogged regularly, and he went curling and cross-country skiing in the winter and fishing in the summer. He states, "I am a very active...was...a very active person. Active with a capital A" (Mr. H.N.).<sup>2</sup> Because of the central importance of physical activity for this man's identity, his inability to engage in these active pursuits following his stroke resulted in a reduced sense of well-being. He states, "curling, you know, I used to curl for years and years. So, you know, now look. Not so good. What quality is there left?", and again when he recounts how he used to go fishing:

I'd go up there and go fishing. You know, sit in the boat all day, watch the loons dive in front of you, and catch bass. Well, you know, that kind of life you're looking at is gone. I'm not so used to it. I mean, you're trapped... (pause) not great.

On the other hand, for the five survivors whose identity did not hinge on being active, the physical restrictions resulting from their stroke had less of an impact on their sense of well-being. For example, one 68-year-old woman whose stroke resulted in a number of physical

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<sup>2</sup> All identifying initials are pseudonyms.

and cognitive impairments (including the inability to recognize faces), experiences considerable restrictions in her life, but her sense of identity, expressed in the nonactive things she values, has not been greatly affected, and consequently her subjective well-being is much higher:

Well, I consider myself very lucky in many ways. I have three wonderful daughters, and as far as I know, they have happy marriages. I have eight grandchildren. I have a lovely view out my window. The grass is cut—no worries about that. And we have nice neighbours. So, I consider myself very lucky in a lot of ways (Mrs. E.E.).

Although a stroke can affect an individual's ability to participate in roles or activities that are important aspects of that person's identity, six of the survivors engaged in a process of adaptation following their stroke whereby they found a way to return to their salient roles and activities, even in a modified form, in order to maintain their sense of subjective well-being. For instance, Mr. V.G. was an accountant before his stroke and had an established accounting practice. But following his stroke, this 63-year-old man was advised that it would be unwise to return to his profession because his cognitive impairments in thinking and reasoning could make him liable. Having lost the ability to engage in this significant identity role, he nevertheless found a way to continue to take part in his business, even in a more limited manner, in order to maintain this aspect of self and his sense of well-being. He states:

I hang out in the office on Fridays. I'm probably a pain, but what the heck... I'm still involved in...you know, like, when we're hiring or stuff like that, or getting new equipment. I give my input...like should we buy new filing cabinets, should we buy a new computer. Stuff like that. Should we give so and so a raise. So I feel confident when I talk about these things.

As survivors recounted their adaptive strategies, it was evident that various resources were important for their ability to successfully engage in adaptation and report a positive sense of well-being. All survivors identified the help they received from rehabilitation programs as extremely important for enabling them to overcome their disabilities and to learn new skills. Six of the survivors also relied on homecare and housekeepers to help them live better with their stroke. Spiritual and religious resources were also mentioned by four people as helping them deal with the difficulties in their post-stroke lives.

Similar to the quantitative findings, life course educational skills were identified as being important for well-being, surfacing in various ways throughout the accounts of all the stroke survivors. For instance, Mr. H.N., a former school principal, draws on his understanding of the dynamics of the educational relationship to get the most out of his rehabilitation therapy:

Being an educator, of course, I listen to instructions and suggestions, you know, I try to incorporate them...Because I know the relationship that has to exist. If somebody knows a little more about, whatever, then I can tap into that.

Correspondingly, although Mrs. F.S. is confined to a wheelchair with a complete left hemiplegia, she draws on her life career skills as a nurse to optimise her nutrition and self-care and enhance her overall well-being.

Lifetime educational experience was also apparent in the various strategies used by survivors to cope with, and adapt to, their residual disabilities and impairments. Mrs. N.M. was a systems analyst before her stroke, and uses her logical reasoning skills to deal with her cognitive limitations and the resulting difficulties she now experiences when using her e-mail program:

When I worked as a systems analyst, I had to listen to other people say, “but I put this in and this didn’t work.” You know, that kind of thing, and now I’m doing it to my daughter, saying “hey honey, I can’t get my e-mail program to work”...and having to break things down into little logical steps.

By tapping into these accumulated life course educational skills, survivors can better implement strategies to adapt to their residual deficits, in order to report a more positive sense of well-being even in the face of persisting disability.

Apart from educational resources, survivors also indicated that they benefited from the help of various social supports. Consistent with the quantitative results, all survivors identified spouses, family members, or friends as providing emotional and instrumental supports that were important for them in their post-stroke lives. Mrs. F.S., a 76-year-old woman who is confined to a wheelchair with a dense left hemiplegia remarks, “I would be a lot more down if I didn’t have the husband I have.” They have been married for 48 years and he assists her with all of her self-care needs, as well as taking care of all the household tasks, with the assistance of the home help and a cleaning lady. Not only does he provide this instrumental support, but he also nurtures her emotionally, being very gentle and humorous with her.

Conversely, the absence or withdrawal of support following a stroke can have negative effects on survivor’s well-being. One woman (Mrs. N.M.) in particular reported instances of being rejected or stigmatized by her peers following her stroke, describing how her neighbourhood friends had “dropped” her following her stroke. She recounts how she felt stigmatized when walking from her home to the bus stop because she could no longer drive:

Because in this neighbourhood, nobody walks except the cleaning ladies. That’s the way it is. And I walked up and down the street, cold winter days and cold winter nights... and nobody offered me a ride. A neighbour said, I saw you walking down the street; is there something wrong with your car?

Similarly, Mrs. N.M. also feels rejected by her husband because of her stroke-related disabilities: “the main difficulty that I’m facing right now, is that I cannot walk well enough that my husband will even walk down the street with me. I think he’s ashamed of me.”

Attempts at adaptation can even fail if social support is negative in its effects. In order to try to adapt to her memory problems following her stroke, Mrs. N.M. developed an extensive filing system of her various interests, which catalogues the various things she needs to know

about different tasks and activities. However, her husband is very critical of this system and tries to remove its presence from the house. Mrs. N.M. elaborates:

I am constantly writing things down on pieces of paper. . . . So I have a huge filing system in the kitchen, in the basement, everywhere, and it gets pretty unwieldy. I have a whole office downstairs in the basement, which my husband is trying to move out of the way, keep out of sight.

## 7. Discussion and integration of findings

By using both quantitative and qualitative methods to examine well-being following a stroke in later life, this study sought to gain a more comprehensive understanding of the stroke experience. Quantitative analyses of large-scale survey data described the factors that influence well-being in stroke survivors, emphasizing the overall prevalence and general salience of the findings. But the underlying *reasons* for the observed associations are not readily apparent from the statistical models; quantitative investigators have typically had to speculate about the unseen processes that account for the observed relationships between variables. The use of qualitative data in a separate sample of community dwelling seniors has helped to shed light on the underlying reasons *why* and *how* these factors operate to affect well-being following a stroke. Moreover, the qualitative findings help to account for the error term, or the imperfect association between variables, in the statistical models.

The quantitative data indicate that physical and cognitive disability are repeatedly associated with a lower sense of well-being following stroke, and the qualitative accounts suggest that the extent to which a disability restricts a person's sense of self, as it contributes to his or her identity, may be a pathway through which these stroke-induced disabilities affect well-being. Numerous studies have illustrated the tremendous impact that chronic illness can have on one's identity in later life (Becker, 1993; Charmaz, 1983, 1987; Kaufman, 1988a, b). Corbin and Strauss (1987, p. 255) argue that bodily changes associated with a chronic condition have a notable effect on the self because "the body is the medium by which conceptions of self are formed." Thus, the qualitative findings help to explain the underlying mechanisms by which residual physical and cognitive disabilities are associated with a reduced sense of well-being following stroke, namely that they prevent survivors from engaging in self-defining activities that constitute important aspects of their identity.

Conversely, the qualitative accounts also indicate that when residual disabilities do not restrict salient aspects of a persons' identity, then the relationship between physical dependence and decreased well-being no longer holds. In this respect, the qualitative findings help to explain why subjective well-being is not perfectly predicted by independence in IADLs in the quantitative models. Additionally, the qualitative findings tell us that psychological processes of adaptation can be important in reducing the adverse effects of functional disability on later life well-being, which may also account for some of the error term in the statistical models. Congruent with Atchley's (1989) theory of continuity, engaging in interaction with business colleagues even over less cognitively challenging matters or



learning to drive a car again even with modifications is an example where survivors return to valued self-defining activities, even in a modified form, in order to maintain a positive sense of well-being in the face of persisting impairments and disabilities. As [Becker \(1993\)](#) found in her qualitative study, a disabled stroke survivor may wish to play a game of golf, but it may instead be sufficient for that individual to be able to walk to the television and turn on a golf game in order to maintain salient aspects of identity.

Life course educational skills may facilitate such adaptive strategies. Education was significantly associated with well-being in the statistical models, having both direct and buffering, or moderating, effects. The qualitative accounts reinforced the importance of education for well-being, as survivors indicated that they used their life course educational skills to maximize their well-being through self-care routines and the use of rehabilitation services. In terms of explaining the statistical interaction effect, the qualitative accounts suggest that education may be beneficial for well-being because it fosters flexible coping skills that help people to face and adapt to the problems and challenges of living with their stroke-induced disabilities ([Ross & Wu, 1995](#)), enabling them to report a more positive sense of well-being even in the face of persisting disability.

The quantitative findings emphasized the importance of social supports for the well-being of stroke survivors, and the qualitative accounts further elucidated the importance of supportive social relationships for a positive sense of well-being. Survivors with strong emotional and instrumental supports reported a positive sense of well-being, largely because they were well cared for both physically and emotionally, while negative supports were associated with a reduced sense of well-being, often because survivors were left with feelings of shame or feeling stigmatized. While social supports have repeatedly been found to be important for post-stroke well-being ([Glass, Matchar, Belyea, & Feussner, 1993](#); [Kim et al., 1999](#); [King, 1996](#)), these qualitative findings help to better explain exactly how such supports operate to affect well-being in stroke survivors.

Social supports also had a moderating, or buffering, effect in stroke survivors, serving to reduce the adverse impact of disability on well-being, as indicated by the significant interaction effects in the regression model for the environmental mastery dimension of well-being. This buffering process was further explained in the qualitative findings. Some of the accounts illustrated how the adverse effects of disability on well-being are much more pronounced in survivors with negative social supports, in part because negative supports hindered strategies designed to adapt to disabilities. For example, one woman's efforts to adapt to her cognitive disabilities and enhance her sense of mastery and control were repeatedly foiled by her husband's negative attitudes and attempts to remove her adaptive aids.

Taken collectively, results from both the quantitative and qualitative data emphasize the substantial impact that a stroke can have on subjective well-being in later life. Yet, with the help of various social resources, individuals engage in a dynamic process of adaptation and adjustment in order to enhance their sense of self and report a positive sense of well-being. The stance of this article is that a combined methods approach permits a more comprehensive understanding of the stroke experience. Quantitative analyses of a large national data set identified those factors that are associated with well-being following stroke. Armed with this background knowledge, qualitative interviews with stroke survivors enabled a more informed



interpretation of the underlying reasons why such factors are associated with well-being, and also help to account for the imperfect association among variables. Casebeer and Verhoef (1997, p. 132) argue that rather than engaging in a methodological debate, it is more instructive to see qualitative and quantitative methods as part of a continuum of research techniques, “all of which are appropriate depending on the research objective.”

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