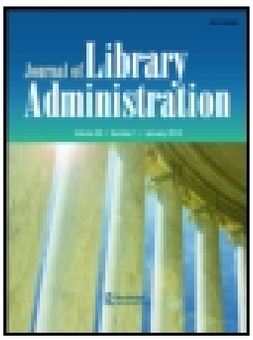
Spring May 28, 2016

The Effects of Labyrinth Walking in an Academic Library.pdf

Donna M Zucker, RN, PhD, FAAN
Jeung Choi, *University of Massachusetts - Amherst*
Matthew N. Cook, *University of Oklahoma Norman Campus*
Janet Brennan Croft



Journal of Library Administration

ISSN: 0193-0826 (Print) 1540-3564 (Online) Journal homepage: http://www.tandfonline.com/loi/wjla20

The Effects of Labyrinth Walking in an Academic Library

Donna M. Zucker, Jeungok Choi, Matthew N. Cook & Janet Brennan Croft

To cite this article: Donna M. Zucker, Jeungok Choi, Matthew N. Cook & Janet Brennan Croft (2016): The Effects of Labyrinth Walking in an Academic Library, Journal of Library Administration, DOI: 10.1080/01930826.2016.1180873

To link to this article: http://dx.doi.org/10.1080/01930826.2016.1180873

Published online: 27 May 2016.

Journal of Library Administration, 00:1–17, 2016
Published with license by Taylor & Francis
ISSN: 0193-0826 print / 1540-3564 online
DOI: 10.1080/01930826.2016.1180873

The Effects of Labyrinth Walking in an Academic Library

DONNA M. ZUCKER
Associate Professor, College of Nursing, University of Massachusetts Amherst, Amherst, MA, USA

JEUNGOK CHOI
Associate Professor University of Massachusetts, College of Nursing Amherst, MA, USA

MATTHEW N. COOK
Emerging Technologies Librarian, University of Oklahoma Libraries, Norman, OK, USA

JANET BRENNAN CROFT
Head of Access and Delivery Services, Rutgers University Libraries, New Brunswick, NJ, USA

ABSTRACT. *The purpose of this study was to determine if labyrinth walking in an academic library would reduce library user stress and promote relaxation. A non- equivalent control group design was employed. Systolic blood pressure was significant for time effect (effect size of .136, and power .721). Pulse rate was significant for time effect (effect size 0.93, and power .507). Satisfaction survey results demonstrated increased satisfaction after labyrinth walking. Data from this pilot will form the basis of a larger scale study to determine the effect of labyrinth walking on stress particularly in high-stress learning environments.*

KEYWORDS academic libraries, stress, labyrinth walking, blood pressure, relaxation, learning environment

Universities and colleges are computer-centric working and learning environments. Evidence shows that roughly 30% to 40% of users experience some level of computer anxiety (Buche, Davis, & Vician, 2007). One study found that among college freshmen that increased Internet hours for online shopping, game playing (Morgan & Cotton, 2003) or research was associated

Address correspondence to Donna M. Zucker, Associate Professor, College of Nursing, University of Massachusetts Amherst, 651 No. Pleasant Street, Amherst, MA 01003, USA. E-mail: donna@acad.umass.edu

with increased depressive symptoms. Additionally, poorly managed exam stress in college students can lead to symptoms of insomnia, suicide, and many other negative health outcomes (Manning, Manolya, & Tarashankar, 2012). On a societal level, the negative effects of stress are pervasive and are implicated in virtually all of our major chronic conditions including heart disease, diabetes, and obesity, as well as mental health disorders such as substance abuse (Wolever et al., 2012). Thus the purpose of this project was to determine if labyrinth walking in an academic library had an impact on stress and self-reported satisfaction.

LITERATURE REVIEW

Labyrinth Walking

Despite psychotherapeutic and pharmacologic interventions for stress, the use of alternative and complementary forms of treatment have gained in usefulness for stress reduction, because they can be self-administered and are low-cost. One such strategy to reduce stress is labyrinth walking. It integrates cognitive and structured, physical exercises in the form of walking meditation and has been known to assist in self-regulation, thus decreasing impulse control, problems interpreting social cues, and poor organization, thus enhancing quality of life (DeBellis, 2001; Teicher, Andersen, Polcari, Andersen, & Navalta, 2002). Labyrinth walking is a form of walking meditation. Participants engage in this activity by walking a purposefully designed path at their own pace, either on the ground outdoors, or on a floor mat or projected image indoors (24- or 40-feet in diameter). The shape of the labyrinth is a variation on a series of circular turns that lead to the center. The entrance is the exit, and an entire walk from beginning to end takes about 20 minutes.

For over a decade, holistic nurses have described various dimensions of the usefulness of labyrinth walking. Labyrinth walking has been explored as having relevance in reducing stress in clinical psychology (Sholem, 2000). Yang (2004) described the need for alternate forms of stress reduction, such as labyrinth walking, for nurses who work in obstetrical cancer nursing settings (Zielinski, 2004). Positive results have been seen in labyrinth walkers who claim it helps them relax, focus, and gain new insight into old problems (Woodside, 2004). Businesses are using labyrinth walking for brainstorming and creative problem solving.

Mindfulness

Labyrinth walking is a form of mindfulness-based stress reduction (MBSR). MBSR is a state of mind that entails a continuous, immediate awareness of physical sensations, perceptions, affective states, thoughts, and imagery. The benefits of this mental state are profound, particularly on stress. Meditation

skills, as taught through the MBSR program, can be useful at every stage of ill health and have been shown to have an impact on both the physical and psychological components of chronic disease states and have been shown to increase a patient's ability to self-regulate and influence their experience of symptoms (Kabat-Zinn, 1993).

The MBSR program's focus is to increase awareness of physical sensations and emotional and mental constructs, and to encourage a person's larger vision of their resources and capacities, personal meaning, self-responsibility, and resilience—even in the face of illness. MBSR's first-class curriculum includes the theme, "There is more right with you than wrong... no matter what your problems are" (Kabat- Zinn, 1993, p. 1). Moreover, a comprehensive meta-analysis (Grossman, Neimann, Schmidt, & Walach, 2004) concluded that the effects of MBSR, which includes walking meditation, were "... found for health parameters of physical well-being, such as medical symptoms, sensory pain, physical impairment, and functional quality-of-life estimates ..." (p. 5). Ultimately, it is no surprise that tech giants, such as Google, have begun to embrace the myriad benefits associated with mindfulness training generally, and labyrinth meditation in particular (Shachtman, 2013).

Workplace-Associated Stress

At a large Canadian university library, staff members have seen evidence of the rising levels of student stress in their dealings with the public while providing reference and research help (Bell, 2013). Attention has turned to include stress-reduction activities into libraries such as pet therapy (Bell, 2013; Mawhiney, 2011) and one study from Australia described the creation of an e-counselor or Avatar to help students reduce their stress in the library at exam time (Manning et al., 2012). The negative health implications of stress are clear, but there is little published data on the outcomes of delivering such innovative stress- reduction activities. What we know about success in stress reduction comes from studies that looked at reducing stress in work environments; libraries are work environments for students.

Stress has an economic impact on the workforce. The International Labor Organization has "estimated that 30% of all work-related disorders are due to stress, and that the loss caused by such stress-induced disorders amounted to EUR 9.2 billion in the EU, EUR 1.1–1.2 billion in the UK, and USD 6.6 billion in the U.S.A. In large-scale studies, employees with high stress have significantly higher annualized medical expenditures (odds ratio = 1.528) compared with those with lower stress, and their medical expenses are estimated at 45% to 46% above those for lower-stress employees (Wolever et al., 2012). With an estimated $6.6 billion lost to stress-induced disorders each year, and a growing emphasis on workplace wellness (even

at the federal level, with the Affordable Care Act), it is clear that labyrinth meditation could potentially benefit high-stress environments, like academic libraries. A study conducted by Baicker, Cutler, and Song (2010) analyzed 22 wellness programs designed to mitigate the risk of these same chronic conditions among employees and estimated "... average reductions of medical costs of about $3.27 for every dollar spent and of absenteeism costs of about $2.73 for every dollar spent" (p. 25).

Impacts on Health

Relieving stress has a positive impact on health. A review of the health-care literature has shown that labyrinth walking was found to have therapeutic value for nursing home clients (Carnes, 2001), for clients in psychiatric facilities, and as therapeutic for some psychiatric illnesses (LaTorre, 2004; Sandor, 2005), as well as for hospice families and clients (Richardson, 2007). All of these studies used qualitative methods to describe the experience and meaning of labyrinth walking, through participant interviews and narratives. In a pilot study, Zucker and Sharma (2012) found that after completing a 6-week pilot labyrinth walking program, county offenders decreased their resting systolic and diastolic blood pressure and rated the program as highly satisfying. Most recently preliminary data from the University of Oklahoma (UO) Library revealed that 65% of respondents reported feeling more relaxed and less anxious after walking the labyrinth in the library that used a projected labyrinth image called SPARQ (Cook & Croft, 2015).

STATEMENT OF INNOVATION

This study was innovative as it was the first to measure blood pressure and pulse before and after labyrinth walking in a high-stress academic library setting. It was also innovative in that it used a touch-pad system that projects one of six labyrinth images on the floor. Finally, the study was the first of its kind to measure blood pressure and pulse as well as relaxation in library labyrinth walkers and compare them to matched control subjects.

METHODOLOGY

This study employed a non-equivalent control-group design to determine a change in subjects' resting heart rate and blood pressure, and self reported relaxation measured after engaging in the labyrinth walking intervention. The setting used was the W.E.B. DuBois Library at the University of Mas-

sachusetts Amherst. The sample was a convenience sample of 45 library users (undergraduate and graduate students, librarians, and faculty). Study team members included nursing faculty and librarians.

Human Subjects Protections

Human subjects protections were insured by obtaining oral and written consent from all subjects. The principle investigator (PI) had overall responsibility for the project and oversight of all procedures, data collection, and analysis. This study received institutional review board approval for the University of Massachusetts Amherst as well as approval from the Dean of the Library. Data were stored in a locked cabinet at the PI office. Any digital data was de- identified and the external drive was locked when not in use.

Procedure Overview

After granting written informed consent, subjects enrolled in the labyrinth walking study. Subjects drew a card at random for group assignment (experiment or control). Both groups had their resting heart rate and blood pressure taken before and after the intervention and control condition respectively, and completed a post-intervention relaxation survey. In the experimental condition (Group 1), group members walked the labyrinth. The control group (Group 2) included reading information posters set up in the labyrinth walking area, each representing a different labyrinth pattern and providing the user with compelling information concerning the culture from which each design originates. The independent variable is labyrinth walking, and the dependent variables are blood pressure and pulse recordings and self-reported relaxation.

Sample and Setting

The sample was composed of 45 undergraduate and graduate students, librarians and faculty (22 in Group 1 and 23 in Group 2). The setting was dedicated space (quiet reading area) in the University of Massachusetts W.E.B. DuBois Library. The study commenced immediately after spring break 2014 and continued until the installation was removed in August 2014.

Intervention

The labyrinth walk was conducted using a novel computer projection system called SPARQ. SPARQ is an interactive mindfulness tool designed to counteract stress and promote wellness in today's computer-centric work

environment. With a touch-screen interface, the SPARQ user first selects from a variety of culturally significant and aesthetically compelling labyrinth designs and then engages the projected pattern to evoke a non-judgmental awareness of the present moment (i.e., mindfulness). The available patterns originate from native America, ancient India, and medieval Europe and each is fully explicated by provided display material. Engagement can take the form of yoga, dance, or a simple walk upon the pattern, which is projected on the floor of the meditation space from overhead. These same images were duplicated on informational posters surrounding the projection area for ease of reading.

Instruments

The study used the Health Team HT8250® digital wrist blood-pressure monitor (Graham-Field, 2015) to measure resting blood pressure. When used correctly, this product has a reported accuracy of +/− 5 mm Hg. for blood pressure and +/− 3 beats/ minute for pulse. Relaxation and satisfaction was measured by the Bizzell Labyrinth Questionnaire (see Appendix A). It consists of one labyrinth-walking survey question comparing nine feeling states, from before labyrinth walking to after. There are six positive feeling states (relaxed, peaceful, centered, open, quiet, and reflective), and three negative feeling states (anxious, stressed, and agitated). The scale ranged from "much more" (feeling state) to "much less" (feeling state). There were two open-ended questions describing/commenting on the experience itself, and two yes/no questions about previous walkers' experience and likelihood of engaging in this experience again. There is reported validity data on this tool (see Appendix B).

RESULTS

Demographic Characteristics

Participants were mostly female (88.9%, n = 40), had a mean age of 36.4 years (SD = 17.4) with a range of 19 to 67. The sample was composed of 13 undergraduate (28.9%) and 10 graduate (22.2%) students, and 19 librarians and faculty (42.2%). Table 1 describes sample characteristics.

The intervention and control groups are equivalent in baseline demographic characteristics. There were no significant differences between the experimental and control groups on demographics (independent $t = .16$, $p = .87$ for age, $\chi^2 = 3.38$, $p = .11$ for gender, $\chi^2 = 4.87$, $p = .09$ for education), indicating random assignment was successful in equating the two groups.

TABLE 1 Demographic characteristics.

	Intervention Group (n = 22)		Control Group (n = 23)		Total (n = 45)	
	Mean	SD	Mean	SD	Mean	SD
Age	35.8	18.6	36.8	16.9	36.4	17.4
	n	%	n	%	n	%
Gender						
Male	0	0	3	13.0	3	6.7
Female	22	100.0	18	78.3	40	88.9
Missing	0	0	2	8.7	2	4.4
Education						
Undergraduate	8	36.4	5	21.7	13	28.9
Graduate	7	31.8	3	13.1	10	22.2
Other	6	27.3	13	56.5	19	42.2
Missing	1	4.5	2	8.7	3	6.7

Note: SD is standard deviation.

Comparison of Experimental and Control Groups

Systolic blood pressure. Blood pressure (BP) and pulse rate readings were collected pre and post-intervention on all subjects. Comparison of group differences on systolic, diastolic BP and pulse rate used RM-ANOVAs. There was a significant mean difference in systolic blood pressure readings before and after the intervention [$F(1, 43) = 6.78$, $p = .01$]. After the intervention, a mean of participants' systolic blood pressure readings decreased from 112.58 (SD = 11.98) to 108.64 (SD = 8.91). However, there was no significant mean difference between the intervention and control groups ($F(1, 43) = .24$, $p = .63$). Tables 2 and 3 show a descriptive summary of systolic and diastolic BP readings and pulse rates (see Table 2) and a summary of RM-ANOVA results (see Table 3).

Diastolic blood pressure. There was no significant mean difference in diastolic blood pressure readings before and after the intervention [$F(1, 43)$

TABLE 2 Descriptive summary of study variables.

	Intervention Group (n = 22)				Control Group (n = 23)			
	Pre-intervention		Post-intervention		Pre-intervention		Post-intervention	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Systolic Blood Pressure	111.6	11.9	108.2	8.3	113.5	12.3	109.1	9.6
Diastolic Blood Pressure	76.4	7.2	74.5	8.6	77.1	9.8	74.3	7.7
Pulse Rate	72.2	6.0	72.0	5.4	69.9	6.0	68.7	6.0

TABLE 3 Results of RM-ANOVA.

	Systolic Blood Pressure			Diastolic Blood Pressure			Pulse Rate		
	*df**	*F***	*p****	*df*	*F*	*p*	*df*	*F*	*P*
Intervention effect (Labyrinth vs. Control)	1, 43	.24	.63	1, 43	.02	.90	1,40	1.87	.18
Time effect (Pre- vs. Post-Interven-tion)	1, 43	6.78	.01	1, 43	3.04	.09	1,40	4.11	.049

Note. RM-ANOVA is repeated measures analysis of variance; *df =degree of freedom; **F= F statistics value; ***p = significance.

= 3.04, $p = .09$]. Also, no differences emerged between the intervention and control groups [F(1, 43) = .02, $p = .90$] (see Tables 2 and 3).

Pulse rate. There was a significant mean difference in pulse rates before and after the intervention (F(1, 40) = 4.11, $p = .049$). After the intervention, a mean of participants' pulse rates decreased from 71.05 (SD = 6.20) to 70.14 (SD = 5.83). However, there was no significant mean difference between the intervention and control groups (F(1, 40) = 1.87, $p = .18$) (see Tables 2 and 3).

Relaxation and satisfaction. The survey was composed of two categories of six positive and three negative feeling states, and items were summed in each category. Subjects in the experimental group reported more positive responses to the labyrinth walking experience compared to the control-group subjects (see Table 4). For positive feeling states, significant differences between the intervention and control groups emerged in feeling relaxed ($p < .001$), peaceful ($p < .001$), and reflective ($p = .003$). For negative feeling states, anxious ($p = .001$), stressed ($p = .009$) and agitated ($p = .008$) showed a significant difference between the intervention and control groups. Table 4 shows a descriptive summary and the results of Mann-Whitney U tests.

Three open-ended questions sought to discover general feelings evoked by the labyrinth walking/viewing experience, reasons for selecting labyrinth patterns, and the value of having a labyrinth in the library. These themes were content-analyzed using criteria from Lincoln and Guba (1985) and using a checklist developed to ensure attention to trustworthiness (Elo et al., 2014). Hand coding using colors aided in this analysis. Subjects positively described the experience, using adjectives such as "relaxing," "refreshed," "rejuvenated" and "intrigued." Reasons for selecting patterns were reported as "familiar," "easy" and "practical." Respondents stated that the value of having a library

TABLE 4 Descriptive summary and results of Mann-Whitney U tests of relaxation and satisfaction.

	Intervention Group (n = 22)		Control Group (n = 23)		Mann-Whitney U	Exact Significance (2-tailed)
	Mean	SD	Mean	SD		
Positive feeling state						
Relaxed	4.44	.53	3.30	.47	17.50	.00
Peaceful	4.20	.42	3.29	.47	16.00	.00
Centered	4.38	.52	4.00	.00	2.50	.48
Open	4.10	.74	4.00	.00	54.00	.59
Quiet	4.43	.53	4.00	.00	14.00	.06
Reflective	4.56	.88	4.00	.00	44.00	.003
Negative feeling state						
Anxious	1.78	.67	3.0000	.00	3.500	.001
Stressed	1.67	.71	3.0000	.00	2.000	.009
Agitated	2.00	.00	3.0000	.00	.000	.008

TABLE 5 Selected qualitative directly quoted comments.

General feelings	Reasons for selecting patterns	Value of the labyrinth
The labyrinth was very relaxing	Chose more open patterns	Gives people the opportunity to center themselves
[I] want to learn more	I did not want to have to think	It allows for a relaxing place in a sometimes stressful area
I felt refreshed	I liked the tree	Nice break from work-hectic pace
I felt rejuvenated	It was a familiar pattern	It can help with stress and anxiety
Intrigued	They looked easy	It's a good service for the library to offer the public
Curious	The intention resonated with me	Reminds people that the library . . . can be a restful and healing place.

labyrinth was "positive in helping people center," "provides a break from the hectic work pace," and "a relaxing place." Selected quotes can be seen in Table 5.

CONCLUSION AND DISCUSSION

The purpose of this study was to determine if labyrinth walking in an academic library had an impact on stress and self-reported satisfaction. The sample was heterogeneous in terms of campus status (student, faculty, li-

brarian, public), age, and education. Results showed lower systolic blood pressures and pulse rates in labyrinth walkers compared to control subjects. In addition the labyrinth walkers reported higher satisfaction and relaxation than control subjects, by self-report questionnaire.

Limitations

The sample size was small (N = 45). While the labyrinth was available between mid- term (March) and late summer, ideally the labyrinth study should be conducted during the fall semester forward, exposing more participants for a longer period of time. The sample also was predominantly female, thus not representative of the campus community. The relaxation and satisfaction questionnaire was used at the request of the SPARQ creator in an effort to aggregate previous data using the same survey. In our study we found the instrument difficult to use given the range of feeling states with this size sample. Also we used the Mann-Whitney U test because survey responses did not provide a normal distribution, thus our probability had low power. An environmental limitation was that the projector couldn't be mounted very high due to the low ceiling.

RECOMMENDATIONS

This study has added to the knowledge base on interventions to reduce stress in libraries. Data also suggest a physiologic response to labyrinth walking, and walkers reported satisfaction and relaxation. Labyrinth walking has had a long anecdotal history of satisfaction and self-reported stress reduction, yet there need to be more studies demonstrating a biological basis for the benefits of this intervention. In an increasing technological environment, every effort to reduce workplace and study stress at the university must be looked at as an opportunity to promote health and well-being.

Further Study

The study results indicate a larger scale study should be undertaken to confirm study findings. In addition, it is recommended to use the new version of SPARQ that has greater mobility and a wider projection area. Installing a labyrinth in the library could be integrated into a larger campus-side effort to enhance workplace wellness.

REFERENCES

Baicker, K., Cutler, D., & Song, Z. (2010). Workplace wellness programs can generate savings. *Health Affairs*, *29*(2), 304–311.

Bell, A. (2013). PAWS for a study break: Running an animal assisted therapy program at the Gerstein Science Information Centre. *The Canadian Journal of Library Information Practice and Research*, *8*(1), 1–14.

Buche, M. W., Davis, L. R., & Vician, C. (2007). A longitudinal investigation of the effects of computer anxiety on performing in a computer-intensive environment, *Journal of Information Systems Education*, *18*(4), 415–423.

Carnes, V. B. (2001). Walking the labyrinth to peace. Not-for-profit report. *Nursing Homes Long Term Care Management*, *50*(10), 41–42.

Cook, M., & Croft, J. B. (2015). Interactive mindfulness technology. A walking labyrinth in an academic library. *College & Research Libraries News*, *76*(6), 318–322.

DeBellis, M. D. (2001). Developmental traumatology: The psychobiological development of maltreated children and its implications for research, treatment, and policy. *Development and Psychopathology*, *13*(3), 539–564.

Elo, S., Kaariainen, M., Outi, K., Polkki, T., Utriainen, K., & Kymgas, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open*, 1–10. doi: 10.1177/2158244014522633

Graham-Field. Retrieved November 27, 2015, from http://www.grahamfield.com/content/search.aspx?searchtext = Wrist+blood+pressure

Grossman, P., Neimann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta- analysis. *Journal of Psychosomatic Research*, *57*(1), 35–43.

Kabat-Zinn, J. (1993). Meditation for stress reduction, inner peace and whatever. *Psychology Today*, July/August, pp. 7–41; 68–69.

LaTorre, M. A. (2004), Integrated perspectives: Walking: An important therapeutic tool. *Perspectives in Psychiatric Care*, *22*(3), 120–122.

Lincoln, S. Y., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage, Thousand Oaks, CA.

Manning, L., Manolya, K., & Tarashankar, R. (2012). E-counsellor: An avatar for student exam stress management. In *Proceedings of the International Conference on Information Management & Evaluation* (pp. 185–193). Atilim University, Ankara, Turkey: Reading, UK: Thompson.

Mawhiney, S. (2011). Dogs provide stress (and comic) relief. *AALL Spectrum*, *16*(2), 6–8.

Morgan, C., & Cotton, S. R. (2003). The relationship between Internet activities and depressive symptoms in a sample of college freshmen. *CyberPsychology & Behavior*, *6*(2), 133–142.

Richardson, R. (2007). Grief walking in the labyrinth. *Journal of Palliative Care*, *23*(3), 219.

Sandor, M. K. (2005). The labyrinth: A walking meditation for healing and self-care. *Explore*, *1*(6), 480–483.

Shachtman, N. (2013). *Meditation and mindfulness are the new rage in Silicon Valley*. Retrieved August 28, 2015 from http://wired.co.uk/magazine/archive/2013/08/features/success-through-enlightenment

Sholem, J. (2000). Listening to the labyrinth: An organic and intuitive inquiry. *Dissertation Abstracts International. Section B. Sciences and Engineering*, *60*(7), 3579–3579.

Teicher, M., Andersen, S., Polcari, A., Andersen, C., & Navalta, C. (2002). Developmental neurobiology of childhood stress and trauma. *Psychiatric Clinics of North America*, *25*(2), 397–426.

Wolever, R. Q., Bobinet, K. L., McCabe, K., Mackenzie, E. R., Fekete, E., Kusnick, C. A., & Baime, M. (2012). Effective and viable mind-body stress reduction in the workplace: A randomized controlled trial. *Journal of Occupational Health Psychology*, *17*(2), 246–58.

Woodside, D. (2004). Unwinding the labyrinth mystery. *New Age Journal*. Retrieved August 28, 2015 from www.newagejournal.com/labyrinth.shtml

Yang, A. C. (2004). Walking the labyrinth: A tool of stress reduction for nurses. *Journal of Gynecologic Oncology Nursing*, *13*(3), 18–22.

Zielinski, K. (2004). The healing power of the labyrinth: When walking around in a circle is good for your health. *Holistic Nursing Practice*, *19*(1), 3–4.

Zucker, D. M., & Sharma, A. (2012). Labyrinth walking in corrections. *Journal of Addictions Nursing*, *23*(1), 47–54.

APPENDIX A1

Bizzell Labyrinth Questionnaire - GROUP 1

Please complete all of the questions. Thank you.

1. Comparing how I felt before I walked the labyrinth with how I feel now, I feel:

	MUCH MORE	MORE	ABOUT THE SAME	LESS	MUCH LESS	NOT APPLICABLE
RELAXED						
PEACEFUL						
CENTERED						
OPEN						
QUIET						
REFLECTIVE						
ANXIOUS						
STRESSED						
AGITATED						

ANY OTHER COMMENTS YOU WOULD LIKE TO MAKE ABOUT YOUR FEELINGS?

2. IS THIS YOUR FIRST TIME WALKING A MEDITATION LABYRINTH?
IF YES, HOW MANY TIMES_____

YES	NO

WHY DID YOU CHOOSE THIS PARTICULAR PATTERN? (DESCRIBE)

3. DID YOU READ THE POSTERS?

YES	NO

IF YES, DID READING THE POSTERS ABOUT THE DIFFERENT LABYRINTH DESIGNS INFLUENCE YOUR DECISION OF WHICH ONE TO WALK?

YES	NO

4. DO YOU THINK A WAKING LABYRINTH ENHANCES THE OVERALL LIBRARY EXPERIENCE?

YES	NO

IF YES, HOW?

GENERAL INFORMATION

AGE: _____YEARS OLD

GENDER:

MALE	
FEMALE	
OTHER	

STUDENT
STATUS:

UNDERGRADUATE	
UNDERGRADUATE	
GRADUATE	
OTHER	

APPENDIX A2

Bizzell Labyrinth Questionnaire - GROUP 2

Please complete all of the questions. Thank you.

1. Comparing how I felt before I viewed the posters with how I feel now, I feel:

	MUCH MORE	MORE	ABOUT THE SAME	LESS	MUCH LESS	NOT APPLICABLE
RELAXED						
PEACEFUL						
CENTERED						
OPEN						
QUIET						
REFLECTIVE						
ANXIOUS						
STRESSED						
AGITATED						

ANY OTHER COMMENTS YOU WOULD LIKE TO MAKE ABOUT YOUR FEELINGS?

2. HAD YOU EVER HEARD OF MEDITATION LABYRINTHS BEFORE TODAY?

YES	NO

IF YES, DESCRIBE.

GENERAL INFORMATION

AGE: _____YEARS OLD

STUDENT STATUS

UNDERGRADUATE	
GRADUATE	
OTHER	

MALE	
FEMALE	
OTHER	

APPENDIX B

Validity of the Labyrinth Walk Questionnaire

Existence of validity for an instrument such as the Labyrinth Walk Questionnaire is never proven conclusively. Rather, evidence is gathered that reflects validity of the instrument for particular populations.

That being said, evidence does point to both content and construct validity for the Labyrinth Walk Questionnaire.

Content Validity

Evidence for content validity came from the process by which the questionnaire was developed as well as from initial review of the instrument and feedback regarding the questionnaire items from individuals knowledgeable about labyrinths. The word list from which the items were developed was compiled by reviewing the overall patterns of responses of individuals to the labyrinth as anecdotally reported in the primary literature at the time the questionnaire was developed: *Walking a Sacred Path: Rediscovering the*

Labyrinth as a Spiritual Tool, by the Rev. Dr. Lauren Artress and *The Way of the Labyrinth* by Helen Curry. At that time Dr. Artress was a canon at Grace Cathedral, San Francisco, CA. She is the person frequently credited with facilitating the resurgence of interest in labyrinths around the world in the late 1990s. Helen Curry is a founding member and the first president of the Labyrinth Society, Inc.

The questionnaire's initial word list contained approximately 16 words. After pilot testing the questionnaire at a labyrinth walk and discussing the word list with the participants in the pilot test, words that appeared to be ambiguous or whose meanings were close to those of other words on the list were eliminated. From this exercise the list was reduced to 10 words and the questionnaire was revised. Next the questionnaire was field tested at the Labyrinth Society's annual Gathering in Lenox, MA, in November 2004. Based on the comments of those who walked the 10 labyrinths at the Gathering and completed the questionnaire, as well as a discussion of the instrument at a meeting of the Labyrinth Society Research Committee and others interested in labyrinth research, no changes were recommended to the list. Among those participating were some of the most noted authorities in the labyrinth field. The comments of the walkers and the consensus of the group discussion indicated that the list was satisfactory for such a "general use" instrument.

Construct Validity

Construct validity has been substantiated through statistical analysis. Intercorrelations (Spearman's rho) ranged from −.734 (correlation of "stressed" to "relaxed") to .765 (correlation of "agitated" to "anxious"). Generally there are moderately high correlations among the questionnaire's 10 scales. Preliminary evidence of construct validity was found by factor analysis; however, this was not completely conclusive because of the sample makeup and size. Additional strength for construct validity resulted from analyses that compared factors from group to group (e.g., labyrinth type) as well as analyses of variance.

Concurrent Validity

Concurrent validity is not really a concern for this type of instrument. It would be more important for a norm-referenced test like the ITBS or a personality test like MMPI. Results vary from labyrinth event to labyrinth event and from person to person. This is to be expected because of the nature of the labyrinth. Different people experience the labyrinth in different ways. The same person experiences the labyrinth differently on successive

labyrinth walks. However, the overall results and data trends obtained from the Labyrinth Walk Questionnaire have been remarkably stable over time.

Additional Evidence of Validity

A simple but important self-validating mechanism included within the questionnaire is Question 2, in which respondents are asked to provide and rate other words that describe their labyrinth walk experience that are not among the 10 included in Question 1. So far, with 524 responses over 34 labyrinth events, only four respondent-supplied effects (Question 2) have been provided by 10 or more respondents.

John W. Rhodes, Ph.D.
Chair, Research Committee
The Labyrinth Society