

Efficacy of a Partner Assistance Intervention Designed to Increase Skin Self-examination Performance

June K. Robinson, MD; Rob Turrisi, PhD; Jerod Stapleton, BS

Objective: To examine the role of partner assistance in learning and implementation of an intervention designed to promote skin self-examination (SSE) behaviors in persons at risk of developing melanoma.

Design: Randomized controlled trial with immediate and 4-month follow-up visits.

Setting: Clinical offices in the ambulatory care area of a hospital.

Patients: The study included 130 participants and their cohabiting partners drawn from a melanoma registry.

Intervention: The subjects were randomly assigned to receive the intervention either as solo learning or as dyadic learning. The intervention consisted of a 10-minute demonstration of the ABCDE (asymmetry of shape, border irregularity, color variegation, diameter ≥ 6 mm, and evolution of the lesion) rule and skills training.

Main Outcome Measures: Behavioral measures included self-reported performance of SSE and use of a body map designed to record areas of concern found during SSE. Intentions, along with attitudinal measures such as perceived importance of SSE and self-efficacy in performing SSE, were also assessed at the 4-month follow-up visit.

Results: The participants in the dyadic learning group were significantly more likely to report engaging in SSE behaviors ($P < .05$). The dyadic learning group also exhibited greater intentions to perform future SSE ($P < .01$), higher perceived importance of SSE ($P < .01$), and higher perceived self-efficacy ($P < .01$).

Conclusion: Dyadic learning may be more effective than solo learning in regard to interventions designed to teach and promote health behaviors, such as SSE.

Arch Dermatol. 2007;143:37-41

AS THE US POPULATION OF adults 65 years and older increases by an estimated 20% in the next decade, the mortality from melanoma is expected to continue to rise because the incidence of melanoma increases with age, particularly after the age of 50 years.¹ From 1973 to 1994, male mortality rates for each age group older than 40 years rose sequentially until they were greatest for men 70 years and older.² Over a 20-year period in Australia and the United States, elderly men were the only group in which the increase in mortality was greater than the incidence.^{2,3} Failing eyesight, lack of a partner, and poor memory in the elderly⁴ and the higher incidence of melanoma on the back in males⁵ may contribute to presentation for care at a later stage in the disease. For persons at risk of developing melanoma, early detection by skin self-examination (SSE) is an effective strategy to decrease mortality and the physical and emotional burden of the disease.

Persons who perform SSE present for care at an earlier stage in the disease process and have 50% less advanced melanoma and markedly lower mortality from melanoma.⁶ Proper performance of SSE may reduce the mortality rate from melanoma by as much as 63%.⁴ Skin self-examination can be learned by those who recognize that they are at risk of developing melanoma, including the elderly.⁷ A recent study showed that patients with a history of skin cancer who were taught SSE detected a second primary melanoma significantly earlier than the primary lesion.⁸ Persons with a personal history of melanoma presented for care with a thinner Breslow depth ($P = .01$), but those with a family history of melanoma were less likely to do so.⁹

Social cognitive theory and self-efficacy theory provide useful frameworks through which to influence health behaviors, such as SSE performance.¹⁰⁻¹² One fundamental principle of social cognitive theory is that individuals learn by

Author Affiliations:

Department of Dermatology, Northwestern University Feinberg School of Medicine, Chicago, Ill (Dr Robinson); and Biobehavioral Health and Prevention Research Center, Pennsylvania State University, University Park (Dr Turrisi and Mr Stapleton).

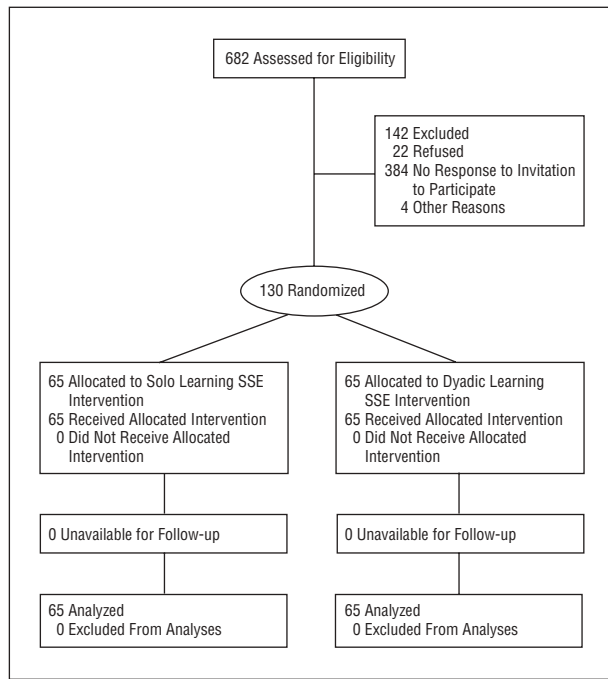


Figure. Flowchart of the study process.

observing the behaviors and the consequences of the behaviors of others. Modeled activities that are positively reinforced tend to be imitated, particularly if the model is seen to be similar to the observer and demonstrates competence. Self-efficacy theory teaches that internal, cognitive representations of the self and assessment of one's capabilities to achieve desired outcomes predispose the person to attempt, learn, and continue new behaviors. These expectancies and beliefs about abilities affect personal choices and can be modified by experience and skills training.¹³

We hypothesize that partners who engage in skin examination skills training, together with positive reinforcement of visual discriminatory abilities of partners, will provide behaviors for each other to model and reinforce. Each partner enhances the belief that they can perform the task for the other one. Thus, solo learning of SSE will be less effective than dyadic learning, through which the partner becomes a prominent influence for SSE performance by engaging in the process of assisting with the examination, by helping to reach decisions about the lesion that is observed, and by reinforcing the performance of SSE by the patient.

METHODS

SAMPLE AND PROCEDURE

The study population consisted of participants drawn from hospital registries of 682 patients who were diagnosed as having cutaneous melanoma (CM) and were being seen at least annually by physicians for their skin conditions. The institutional review boards of Loyola University Medical Center, Maywood, Ill, and Dartmouth-Hitchcock Medical Center, Lebanon, NH, approved the research protocol. The subjects were offered nominal payment for their participation.

One hundred thirty participants were randomly assigned to receive the intervention either as solo learning (n=65) or as dyadic learning (n=65) (Figure). Inclusion criteria included the participant's being 40 to 70 years old with a cohabitating partner and being able to see to read a newspaper. Other inclusion criteria included the participant's having (1) a personal history of CM treated at least 6 months ago, (2) a family history of CM, (3) a large number of nevi (>50), or (4) two or more pathologically confirmed atypical nevi. Exclusion criterion included the participant's being overburdened with other comorbid diseases such as chronic immunosuppression as a result of organ transplantation or having insufficient vision to see his or her own skin as determined by the ability to see to read a newspaper. Eligible partners must have had a spousal or cohabitational relationship for at least 1 year with the participant before the intervention.

The intervention consisted of a card with condensed information about SSE and color illustrations of the ABCDE (asymmetry of shape, border irregularity, color variegation, diameter ≥ 6 mm, and evolution of the lesion) rule. A trained research assistant presented the information on the card regarding the ABCD rule to the participant (participant and partner in the dyadic learning group) and showed 2 additional color printed examples demonstrating the evolution of pigmented lesions in 1 year, answered questions about the content, gave a skills demonstration using a magnifying hands lens to look at moles and pointed out irregular borders and uneven colors, and administered a preskills and postskills training quiz to assess the immediate efficacy of the intervention. In addition to taking the skills training quizzes, participants also completed a written preintervention and postintervention SSE assessment that measured absolute skin cancer risk, perceived risk, perceived benefits of a skin examination, self-efficacy of performing SSE, skin examination behavioral tendencies, skin cancer knowledge, and attitudes toward SSE. At the conclusion of the intervention, the research assistant gave an enabling kit consisting of the card, a lighted handheld magnifying glass, and a set of body maps to use as a diary to record areas of concern found during the monthly SSE. The participants used the body maps as a guide for SSE by marking sites of concern. The act of documenting SSE performance is thought to be efficacious in promoting SSE. The effectiveness of dyadic learning vs solo learning was assessed at a 4-month follow-up visit through administration of the skills quiz and the SSE assessment, and the body map performed as a diary to record the frequency of SSE.

OUTCOME MEASURES

Perceived Self-efficacy in Performing SSE

Because of the high interitem correlation ($\alpha = .92$), 4 items were summed to create an index of self-efficacy in performing SSE. The items assessed confidence in performing SSE (eg, "How confident are you that you know how to examine your skin for signs of sun damage or skin cancer?") and in finding a partner to help with performing SSE. All items were measured on separate 5-point Likert-type scales (0, not at all confident; 4, extremely confident).

Perceived Importance of SSE

Participants were asked about the importance of performing SSE and the importance of having a partner assist with SSE. All items were measured on separate 5-point Likert-type scales (0, not at all important; 4, extremely important).

Behavioral Outcomes

Behavioral outcomes were measured with 3 items assessing the number of times that participants reviewed SSE guidelines, examined their skin, and examined their skin with a partner in the last 6 months. These outcomes were measured on a 5-point Likert-type scale ranging from "never" to "daily." Three dichotomous variables were also created to measure the use of the body map at 1-, 2-, and 3-month follow-up visits.

Behavioral Intentions

Postintervention behavioral intentions to examine the skin and body were assessed with 2 dichotomous items (eg, "Based on the things you learned in the experience in the cancer center, do you intend to start checking your face within the next month?").

RESULTS

No important differences were found in important demographic characteristics (**Table 1**). A 2 (condition) \times 3 (time) mixed-measures analysis of variance (ANOVA) was performed to determine the importance ratings of conducting SSE every month, and a significant interaction was observed ($F_{2,254}=25.29$; $P<.001$; $\eta^2=0.17$). Using the recommendation of Jaccard,¹⁴ pairwise comparisons of the means were performed using the Tukey test at each period. Examination of the means revealed no significant differences at baseline, but significant differences were observed in the anticipated direction at the immediate and long-term follow-up visits (**Table 2**). Next, a 2 (condition) \times 3 (time) mixed-measures ANOVA compared the importance ratings of having a partner help conduct SSE, and a similar significant interaction was observed ($F_{2,254}=29.14$; $P<.001$; $\eta^2=0.19$), with the patterning of means again showing no differences at baseline but significant differences at the immediate and long-term follow-up visits (Table 2). Third, a 2 (condition) \times 3 (time) mixed-measures ANOVA was conducted on a composite variable reflecting perceived self-efficacy in performing SSE (eg, confidence that you [1] know how to examine your skin for signs of skin cancer, [2] know the difference between skin cancer and other types of damage, [3] can perform a careful examination, and [4] can find a partner to help examine hard-to-see places). For this analysis, a significant interaction was observed ($F_{2,252}=35.40$; $P<.001$; $\eta^2=0.22$). Again, no significant differences were observed at baseline, and significant differences were observed in the anticipated direction at the immediate and 4-month follow-up visits (Table 2). Thus, the intervention appeared to have the intended impact on increasing the perceived importance of conducting SSEs, the importance of having a partner assist in conducting SSEs, and the perceived self-efficacy in conducting SSEs.

The generalizability of these findings to behavioral outcomes was explored by conducting a comparison between the groups on behavioral intentions and behavioral outcomes, including actual SSEs, using data from the body map assessments. At the 4-month follow-up visits, paired-learning individuals (treatment) showed sig-

Table 1. Baseline Demographic Characteristics of Study Participants

Characteristic	No. (%)	
	Control Group (n = 65)	Partner Assistance Group (n = 65)
Sex		
Male	33 (51)	32 (49)
Female	32 (49)	33 (51)
Age, y		
18-29	11 (17)	7 (11)
30-39	11 (17)	17 (26)
40-49	9 (14)	14 (22)
50-59	8 (12)	8 (12)
60-69	15 (23)	15 (23)
≥ 70	11 (17)	4 (6)
If, after several months of not being in the sun, you stayed outdoors for 1 h at noon for the first time in the summer without sunscreen, what would happen to your skin?		
Always sunburn, never tan	19 (29)	17 (26)
Sunburn easily, tan minimally	29 (47)	25 (38)
Sunburn sometimes, tan gradually	13 (20)	19 (29)
Rarely sunburn, tan easily	4 (6)	2 (4)
Never sunburn, always tan	0	0
Positive family history of skin cancer	29 (45)	29 (45)

nificantly stronger intentions to perform SSEs on the face ($t_{126}=7.42$; $P<.001$) and skin in general ($t_{126}=7.41$; $P<.001$) than the solo-learning individuals (controls). A 2 \times 3 mixed-measures ANOVA revealed significant interaction effects for the following behaviors: review of SSE guidelines ($F_{2,254}=13.36$; $P<.001$, $\eta^2=0.095$), examination of skin without a partner ($F_{2,254}=30.54$; $P<.001$; $\eta^2=0.19$), and examination of skin with a partner ($F_{2,252}=31.27$; $P<.001$; $\eta^2=0.20$). Finally, differences were observed between the treatment group and the control group on the postintervention body map data reflecting skin examinations ($X_1^2=17.06$; $P<.001$). Significantly more solo learners than dyadic learners did not check their skin at the long-term follow-up visit (45 vs 23; $P<.05$), whereas significantly more dyadic learners checked their skin 1 time (19 vs 9; $P<.05$) and several times (13 vs 4; $P<.05$).

COMMENT

For most people, early recognition of CM remains a matter of visual inspection by the physicians, the patients, and/or their partners.¹⁵⁻¹⁷ Because patients initially discover approximately 50% of melanomas,¹⁷ the best opportunity for early detection may be SSE in those at risk of developing melanoma. The risk of developing melanoma is well defined by the personal and family histories of patients with melanoma, as

Table 2. Attitudes, Intentions, and Behavioral Outcomes*

Type of Outcome	Outcome Measure	Baseline		Immediate Follow-up		4-Month Follow-up	
		Control	Treatment	Control	Treatment	Control	Treatment
Attitude	Perceived importance of SSEs	0.51 (0.71)	0.03 (0.16)	0.91 (0.86)	1.00 (0.89)	0.95 ^c (0.98)	1.61 ^d (1.38)
Attitude	Having a partner assist with SSE	0.15 (0.40)	0.05 (0.28)	0.80 ^a (1.12)	1.22 ^b (1.08)	0.77 ^c (1.11)	2.23 ^d (1.71)
Attitude	Perceived self-efficacy in conducting SSE	0.63 (0.84)	0.05 (0.22)	2.23 ^a (2.44)	2.95 ^b (3.10)	2.25 ^c (2.88)	6.00 ^d (4.91)
Intention	To check face after intervention	NA	NA	0.56 (0.50)	0.61 (0.49)	0.34 ^c (0.48)	0.66 ^d (0.48)
Intention	To check body after intervention	NA	NA	0.53 (0.50)	0.63 (0.49)	0.33 ^c (0.47)	0.65 ^d (0.48)
Behavioral outcome	Reviewed SSE guidelines	0.03 (0.17)	0.00 (0.00)	0.08 (0.27)	0.00 (0.00)	0.55 ^c (0.53)	0.91 ^d (0.68)
Behavioral outcome	Examined skin by self	0.02 (0.12)	0.00 (0.00)	0.02 (0.12)	0.00 (0.00)	0.23 ^c (0.42)	0.80 ^d (0.74)
Behavioral outcome	Examined skin with a partner	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.23 ^c (0.42)	0.81 ^d (0.72)

Abbreviation: NA, not applicable (intentions were not measured at baseline).

*Values are given as mean (SD); a vs b reflects a pairwise difference ($P < .05$) at the immediate follow-up visit; c vs d reflects a pairwise difference ($P < .05$) at the long-term follow-up visit.

well as by physical findings of the number and type of nevi. Those with a history of melanoma have an 11.4% chance of developing another melanoma, with almost half of that risk occurring in the first year.¹⁸ It is well accepted that patients with a personal history of melanoma and their first-degree relatives¹⁹ benefit from screening via annual total-body skin examination by a physician, and monthly SSE for these patients is encouraged.

Because melanoma in the elderly, especially older men, is related to a lifetime of solar exposure, those who are most at risk include people with a history of excessive solar exposure, multiple sunburns, and an inability to tan readily. In 2000, the Institute of Medicine recognized the need for clinicians and patients “to be alert to the common signs of skin cancer—with particular emphasis on older white males and on melanoma.”²⁰ From 1998 to 2002, melanoma death rates in men decreased by 1.6% per year; however, melanoma remained the 15th most common cause of death from cancer in men.²¹ Owing to the demographic phenomena of aging with an increase in the absolute size of the US population, there was an increase in the absolute number of melanoma deaths during those years, and this is expected to continue.

The performance of SSE was associated with being female.^{22,23} In a prior study, we found that SSE was associated with the likelihood of asking for help from a partner,²⁴ younger age (≤ 59 years), and risk perception²⁴; however, the strongest predictors of SSE by a patient with a history of a skin cancer were attitude and confidence in SSE performance.²⁴ The present study confirms that dyadic learning of SSE enhances the perceived importance of SSE, self-efficacy in performing SSE, and performance of SSE. Attitude and belief in the ability to perform SSE are fostered when the partners learn about melanoma recognition and skills training together. Partners may provide social reinforcement for SSE and assist in checking locations that are difficult for the patient to see, eg, scalp, back, ears, and back of legs.

While the generalizability of this study of cohabitating adult partners to first-degree relatives as partners is un-

known, it is possible that the role of being a partner may be beneficial to the first-degree relative. First-degree relatives of patients with melanoma often do not perform SSE; thus, the medically well-established risk factor of a having a family history of CM does not enable SSE by family members.⁹ Future studies will explore the influence of privacy concerns, the availability of a partner, and the relationship with the partner on SSE attitudes and performance. The observation of performing more rather than less SSEs in certain individuals will help target future intervention efforts to those having the greatest needs.

This study of dyadic learning affirms the role of partners in health care and extends it to promoting health behaviors. Spousal support was recognized as a tangible aid to recovery from heart disease and patient compliance with medical regimens, including lipid-lowering diets.²⁵⁻²⁸ Diabetes care²⁹ and spouse-assisted pain-coping skills training for pain control in patients with osteoarthritis of the knees³⁰ have engaged partners in learning how to provide health care. Dyadic learning is expected to enhance health promotions and wellness behaviors, such as prevention and early detection of other skin cancers.

Accepted for Publication: June 23, 2006.

Correspondence: June K. Robinson, MD, Northwestern University Feinberg School of Medicine, 132 E Delaware Place, Suite 5806, Chicago, IL 60611 (wtbjkr@rcn.com).

Author Contributions: Dr Robinson takes responsibility for the integrity of the paper. *Study concept and design:* Robinson and Turrisi. *Acquisition of data:* Robinson and Turrisi. *Analysis and interpretation of data:* Robinson, Turrisi, and Stapleton. *Drafting of the manuscript:* Robinson, Turrisi, and Stapleton. *Critical revision of the manuscript for important intellectual content:* Robinson, Turrisi, and Stapleton. *Statistical analysis:* Turrisi. *Obtained funding:* Robinson and Turrisi. *Administrative, technical, and material support:* Robinson and Turrisi. *Study supervision:* Robinson and Turrisi.

Financial Disclosure: None reported.

Funding/Support: This study was supported in part by grant 5R21 CA-103833-02 from the National Cancer Institute, Bethesda, Md (Dr Robinson).

Disclaimer: Dr Robinson, who is chief editor of the ARCHIVES, was not involved in the editorial evaluation or editorial decision to accept this work for publication.

REFERENCES

1. Weir HK, Thun MJ, Hankey BF, et al. Annual report to the nation on the status of cancer, 1975-2000, featuring the uses of surveillance data for cancer prevention and control. *J Natl Cancer Inst.* 2003;95:1276-1299.
2. Hall HI, Miller DR, Rogers JD, Bewerse B. Update on incidence and mortality from melanoma in the United States. *J Am Acad Dermatol.* 1999;40:35-42.
3. Australian Institute of Health and Welfare Web site. <http://www.aihw.gov.au>. Accessed March 21, 2006.
4. Kelly JW. Melanoma in the elderly—a neglected public health challenge. *Med J Aust.* 1998;169:403-404.
5. Balch CM, Soong SJ, Gershenwald JE, et al. Prognostic factors analysis of 17,600 melanoma patients: validation of the American Joint Committee on Cancer melanoma staging system. *J Clin Oncol.* 2001;19:3622-3634.
6. Berwick M, Begg CM, Fine JA, Roush CG, Barnhill RL. Screening for cutaneous melanoma by skin self-examination. *J Natl Cancer Inst.* 1996;88:17-23.
7. Hanrahan PF, Hersey P, Menzie SW, Watson AB, D'Este CA. Examination of the ability of people to identify early changes of melanoma in computer-altered pigmented skin lesions. *Arch Dermatol.* 1997;133:301-311.
8. DiFronzo LA, Wanek LA, Morton DL. Earlier diagnosis of second primary melanoma confirms the benefits of patient education and routine post-operative follow-up. *Cancer.* 2001;91:1520-1524.
9. Fisher NM, Schaffer JV, Berwick M, Bologna JL. Breslow depth of cutaneous melanoma: impact of factors related to surveillance of the skin, including prior skin biopsies and family history of melanoma. *J Am Acad Dermatol.* 2005;53:393-406.
10. Bandura A. Self-efficacy mechanism in physiological activation and health-promoting behavior. In: Madden J, Matthyse SP, Barchas J, eds. *Adaptation, Learning and Affect*. New York, NY: Raven Press; 1988.
11. Bernier M, Avard J. Self-efficacy, outcome, and attrition in a weight-reduction program. *Cognit Ther Res.* 1986;10:319-338. doi:10.1007/BF01173469.
12. DiClemente CC. Self-efficacy and smoking cessation maintenance: a preliminary report. *Cognit Ther Res.* 1981;5:175-187. doi:10.1007/BF01172525.
13. Ewart CK. Usefulness of self-efficacy in predicting overexertion during programmed exercise in coronary artery disease. *Am J Cardiol.* 1986;57:557-561.
14. Jaccard J. *Interaction Effects in Factorial Analysis of Variance*. Newbury Park, Calif: Sage Publications; 1998.
15. Menzies SW, Ingvar C, McCarthy WH. A sensitivity and specificity analysis of the surface microscopy features of invasive melanoma. *Melanoma Res.* 1996;6:55-62.
16. Robinson JK, Nickoloff BJ. Long-term digital epiluminescence surface microscopy surveillance of high-risk patients. *Arch Dermatol.* 2004;140:49-56.
17. Koh HK, Miller DR, Geller AC, Clapp RW, Mercer MB, Lew RA. Who discovers melanoma? patterns from a population-based survey. *J Am Acad Dermatol.* 1992;26:914-919.
18. Ferrone CR, Porat LB, Berwick M, Halpern AC, Patel A, Coit DG. Clinicopathological features of and risk factors for multiple primary melanomas. *JAMA.* 2005;294:1647-1654.
19. Greene MH. The genetics of hereditary melanoma and nevi. *Cancer.* 1999;86:2464-2477.
20. Institute of Medicine. *Extending Medicare Coverage for Prevention and Other Services*. Washington, DC: National Academy Press; 2000.
21. Edwards BK, Brown ML, Wingo PA, et al. Annual report to the nation on the status of cancer, 1975-2002, featuring population-based trends in cancer treatment. *J Natl Cancer Inst.* 2005;97:1407-1427.
22. Robinson JK, Rigel DS, Amonette RA. What promotes skin self-examination? *J Am Acad Dermatol.* 1998;38:752-757.
23. Weinstock MA, Martin RA, Riscia PM, et al. Thorough skin examination for the early detection of melanoma. *Am J Prev Med.* 1999;17:169-175.
24. Robinson JK, Fisher SG, Turrisi RJ. Predictors of skin self-examination performance. *Cancer.* 2002;95:135-146.
25. Bovbjerg VE, McCann BS, Brief DJ, et al. Spouse support and long term adherence to lipid-lowering diets. *Am J Epidemiol.* 1995;141:451-460.
26. Doherty WJ, Schrott HG, Metcalf L, Iasiello-Vailas L. Effect of spousal support and health beliefs on medication adherence. *J Fam Pract.* 1983;17:837-841.
27. Rogers KR. Nature of spousal supportive behaviors that influence heart transplant patient compliance. *J Heart Transplant.* 1987;6:90-95.
28. Yates BC. The relationship among social support and short- and long-term recovery outcomes in men with coronary heart disease. *Res Nurs Health.* 1995;18:193-203.
29. Trief PM, Himes CL, Orendorff R, Weinstock RS. The marital relationship and psychosocial adaptation and glycemic control of individuals with diabetes. *Diabetes Care.* 2001;24:1384-1389.
30. Keefe FJ, Caldwell DS, Baumcom D, et al. Spouse-assisted coping skills training management of osteoarthritic knee pain. *Arthritis Care Res.* 1996;9:279-291.