

Interoceptive Exposure Exercises for Evoking Depersonalization and Derealization: A Pilot Study

James Lickel, MS
Elizabeth Nelson, MA
Athena Hayes Lickel, MS
Brett Deacon, PhD

University of Wyoming, Laramie

This study examined the potential of 11 interoceptive exposure exercises to produce depersonalization and derealization among high anxiety-sensitive undergraduate students. Inspired by a February 2007 thread on the Association for Behavioral and Cognitive Therapies listserv, we identified nine exercises and compared their capacity to produce depersonalization and derealization with two previously validated tasks: mirror and dot staring. Results indicated that five exercises, including hyperventilation (1 minute), hyperventilation (5 minutes), hyperventilation plus spiral staring, hyperventilation plus strobe light, and strobe light alone, were superior to either mirror or dot staring at inducing depersonalization or derealization. If replicated in a clinical sample, our findings may be used to assist clinicians seeking to evoke these states via interoceptive exposure.

Keywords: depersonalization; derealization; unreality; interoceptive exposure

Interoceptive exposure (IE) is a valuable component of cognitive behavioral treatments for panic disorder (Gould, Otto, & Pollack, 1995) that is commonly employed to induce physical sensations approximating those present during panic attacks (e.g., heart palpitations, dizziness). Although IE exercises such as breathing through a straw or running in place are effective in eliciting many panic-related sensations, evoking episodes of depersonalization and derealization presents a challenge for many clinicians. An episode of depersonalization or derealization is characterized by the experience of unreality with regard to the self or surroundings, respectively. Difficulty evoking such episodes was recently discussed during an Association for Behavioral and Cognitive Therapies (ABCT) listserv exchange in February 2007. A number of members noted the paucity of exercises that are effective at eliciting episodes of depersonalization and derealization and suggested that the standard exercises used to evoke such states, including staring at oneself in the mirror and staring at a dot on the wall (Antony, Ledley, Liss, & Swinson, 2006; Schmidt & Trakowski, 2004), were ineffective for many of their clients.

Elucidating effective methods of treating fear of depersonalization or derealization is important, as a majority of individuals with panic disorder experience these states during panic attacks

(Barlow & Craske, 1988). Cox and Swinson (2002) found that 71.0% of individuals with panic disorder reported experiencing episodes of depersonalization or derealization. Further, panic disorder patients who experience such episodes also report more severe dysfunction as evidenced by increased depression, stress, trait anxiety, and fear of panic symptoms (Miller, Brown, DiNardo, & Barlow, 1994). In addition to dissociative disorders, periods of unreality have been reported among individuals with posttraumatic stress disorder and eating disorders (e.g., Schumaker, Warren, Carr, Schreiber, & Jackson, 1995; Van der Kolk, Pelcovitz, Roth, & Mandel, 1996). Thus, identification of exercises that induce these episodes may be useful in the treatment of a range of psychological problems.

To date, few studies have empirically investigated exercises designed to produce depersonalization or derealization. Miller et al. (1994) examined the extent to which three behavioral exercises (staring at a dot on the wall, staring at one's reflection in the mirror, and silently repeating one's name) and two control exercises induced episodes of depersonalization and derealization among individuals with panic disorder who regularly experienced such episodes, individuals with panic disorder who never experienced such episodes, and nonanxious controls. Compared to the control exercises, the dot and mirror tasks were more effective in evoking episodes of depersonalization and derealization in each group of participants. In a similar study, Leonard, Telch, and Harrington (1999) examined whether three IE exercises (dot staring, pulsed photic–audio stimulation, and stimulus deprivation) successfully induced dissociative symptoms among individuals high and low in the propensity to experience dissociation. Leonard et al. measured dissociation by asking participants to indicate the extent to which each exercise evoked episodes of depersonalization and derealization as well as other states characterizing loss of reality, including gaps in awareness and amnesic episodes. Each exercise resulted in increased report of dissociation. However, both pulsed photic–audio stimulation and stimulus deprivation were significantly stronger elicitors of dissociation than dot staring.

A few exercises that evoke episodes of depersonalization, derealization, or dissociation have been identified. However, conclusions drawn from a recent ABCT listserv thread suggest that standard IE exercises, such as mirror and dot staring, may not be adequate elicitors of depersonalization and derealization for many clients. As such, further investigation of IE exercises that more effectively produce these states is necessary to provide clinicians with the means to sufficiently activate the fear structures of clients who experience and fear episodes of unreality (Foa & Kozak, 1986). The present study was conducted to identify IE exercises that more effectively evoked the sensations of depersonalization or derealization than mirror or dot staring. Drawing from previous research, suggestions posted to the ABCT listserv, and clinical experience, we identified and tested 11 exercises designed to elicit episodes of unreality. Undergraduate students with high levels of anxiety sensitivity, a risk factor central to the psychopathology of panic attacks and panic disorder (McNally, 2002), were chosen to serve as an analog panic disorder sample. To maximize clinical utility, we selected tasks that could be incorporated into routine IE assessment¹ by virtue of their relatively short duration and inexpensive material costs.

METHOD

Participants

The sample was selected from a pool of 430 undergraduate students enrolled in psychology and criminal justice classes at the University of Wyoming. Interested students completed a mass testing questionnaire packet for course credit that included the Anxiety Sensitivity Index-3 (ASI-3; Taylor et al., 2007). Eligible participants were identified on the basis of their ASI-3 scores. Sixty-seven individuals who scored more than one standard deviation above the sample mean of 12.4 ($SD = 9.4$) were invited to participate via e-mail. Twenty-three of the invited individuals responded and

volunteered to participate. Most were women (60.9%), the mean age was 21.4 years ($SD = 3.6$), and the sample was predominantly White (82.6%).

Measures

ASI-3. The ASI-3 is an 18-item self-report measure of fear of anxiety-related sensations. It was used in the present study to identify participants with concerns approximating those of individuals with panic disorder. The ASI-3 possesses improved psychometric properties and validity compared to the original Anxiety Sensitivity Index (Peterson & Reiss, 1992) and the Anxiety Sensitivity Index—Revised (Taylor & Cox, 1998). Items are scored on a 5-point scale ranging from 0 (“very little”) to 4 (“very much”), with total scores ranging from 0 to 72. The internal consistency of the ASI-3 among the 430 students screened for this study was adequate ($\alpha = .88$). The mean ASI-3 score for participants in the present study was 28.30 ($SD = 4.97$). The mean score for panic disorder patients reported by Taylor et al. (2007) was 32.6 ($SD = 14.3$).

Depersonalization–Derealization Inventory. Participants completed the 28-item Depersonalization–Derealization Inventory (DDI; Cox & Swinson, 2002) to assess their past experiences with depersonalization and derealization. In a clinical sample of panic disorder patients experiencing depersonalization or derealization, Cox and Swinson (2002) obtained a mean score of 50.2 ($SD = 24.4$). The authors reported that the DDI had excellent internal consistency ($\alpha = .95$) and was significantly correlated with measures of depression, anxiety, and panic symptoms (Cox & Swinson, 2002). In this study, the DDI was used to characterize how similar the present sample’s report of depersonalization and derealization were to individuals with panic disorder who experience these episodes. In the present study, the mean DDI score was 39.70 ($SD = 17.72$), and the internal consistency of the DDI was excellent ($\alpha = .94$).

Postexercise Ratings. Following each of the 11 exercises (see the following discussion), participants provided verbal ratings of the extent to which they experienced depersonalization, derealization, and anxiety. The terms *depersonalization* and *derealization* were described to each participant as follows: “Depersonalization may involve feeling like your body is strange or different in some way, feeling detached or separated from your body, feeling as if your emotions are disconnected from yourself, feeling as if you’re not in control, or feeling spacey or spaced out. Derealization may involve feeling detached or separated from your surroundings, feeling that objects or your surroundings are strange or unreal, or difficulty focusing attention.” The definitions of depersonalization and derealization were verbally administered to participants a total of two times before they completed the exercises. Further, participants were invited to ask questions about the difference between depersonalization and derealization prior to completion of the exercises. Each rating was made on an 11-point scale ranging from 0 to 10 with 0 equaling no feelings, 5 equaling moderate feelings, and 10 equaling extreme feelings of depersonalization, derealization, or anxiety. The rating scale mirrored the scale used by Schmidt and Trakowski (2004) as well as the scale suggested for use in the popular client manual *Mastery of Your Anxiety and Panic* (4th ed.) (Barlow & Craske, 2007).

Selection of Exercises

A subset of the exercises was selected from those reported in previous research. Specifically, the mirror and dot staring exercises were used by Miller et al. (1994), and the stimulus deprivation task was based on an exercise described by Leonard et al. (1999). Hyperventilation is a standard IE exercise in popular cognitive behavioral treatment protocols (e.g., Barlow & Craske, 2007). The lightbulb staring and reading task was suggested on the ABCT listserv in February 2007, and a variant of this exercise was previously used by Antony et al. (2006). Finally, spiral staring, strobe light, their combinations with hyperventilation, and spinning with prescription eyeglasses were developed by the authors for this study.

Description of Exercises

All 11 exercises took place in a 2.44 × 3.05-m windowless room containing two chairs, a desk, and the materials described here. Before each exercise, participants were given the corresponding instructions, asked not to suppress or avoid any sensations that might occur, and reminded of the ratings to be made following each exercise. Following is a description of each exercise employed. The experimenter was required to exit the experiment room during the mirror staring, dot staring, and stimulus deprivation exercises to avoid distracting the participant. For all other exercises, the experimenter stood quietly in the corner of the room.

Mirror Staring. Each participant was seated in a chair and instructed to hold the sides of a full-length mirror (35.56 × 121.92 cm) while placing its bottom on his or her knees. Participants were instructed to sit still and stare intently at the reflection of their eyes. The exercise lasted for 3 minutes.

Dot Staring. Participants were seated in a chair positioned 1.83 m away from an eye-level dot across from them. The dot was 5.08 cm in circumference and laid flat against the wall. The same size dot was employed by Miller et al. (1994). Each participant was instructed to stare intently at the dot for a period of 3 minutes.

Spinning With Prescription Eyeglasses. Each participant was instructed to spin at a rate of one rotation every 2 seconds while wearing a pair of prescription eyeglasses. The strength of the eyeglasses was +3.00 for both lenses. Participants already wearing corrective eyewear were instructed to wear the study eyeglasses over their own eyewear. The experimenter instructed participants to spin for a period of 30 seconds and then stand in place for 30 seconds while keeping their hands to their sides and eyes open. Participants repeated spinning and standing in place three times for a total of 3 minutes.

Lightbulb Staring and Reading. Participants were seated at a desk with a small reading lamp to their left and a newspaper in front of them. The 60-watt lightbulb in the lamp was pointed directly at the participant from a distance of 45 cm. The experimenter verbally instructed each participant to stare at the lightbulb for a period of 30 seconds and then read from the newspaper for 30 seconds. Staring at the lightbulb and then reading from the newspaper was repeated three times for a total of 3 minutes.

Stimulus Deprivation. Participants stood in the middle of a dark room while wearing a blindfold and noise-blocking headphones for a period of 3 minutes. Participants were instructed to stand still with their eyes closed.

Hyperventilation (1 Minute). Participants stood in the center of the experiment room and hyperventilated for a period of 1 minute. Participants were instructed to breathe in as deeply as they could and then breathe out completely at a rate of 45 breaths each minute in accordance with an audiotape repeating the words *in* and *out* at the correct pace.

Hyperventilation (5 Minutes). This exercise was the same as the hyperventilation (1 minute) exercise except participants were asked to hyperventilate for a period of 5 minutes, during which time they were given five “normal breathing breaks.” The normal breathing breaks lasted for 15 seconds and began at the 45-second mark of each minute (i.e., 45 seconds, 1 minute 45 seconds, and so on).

Spiral Staring. Participants were seated at a desk directly in front of a laptop computer. They were instructed to stare intently at the center of a moving spiral rotating at the speed of 100 revolutions per minute for a period of 3 minutes. The spiral can be located at <http://dogfeathers.com/java/spirals.html>. During this exercise, the lights were turned off, and the experimenter stepped out of the participant’s field of view.

Hyperventilation Plus Spiral Staring. Participants were seated at a desk and instructed to stare at the center of a moving spiral, following the same spiral staring procedures detailed previously, for a period of 3 minutes. While staring at the spiral, participants hyperventilated, following the same hyperventilation procedures described previously, at a rate of 45 breaths each

minute. Participants were given three 15-second normal breathing breaks, during which they were instructed to continue staring at the center of the moving spiral.

Strobe Light. Participants were asked to stand in the middle of the dark experiment room with an inexpensive strobe light placed on a seat 1 m behind them. During this exercise, participants were instructed to stand still and stare at the center of their shadow on the wall in front of them for a period of 3 minutes. The strobe light's speed was adjusted to 75% of full speed. The experimenter stood outside the participant's field of vision.

Hyperventilation Plus Strobe Light. Participants stood in the dark room with a strobe light, following the same procedures as detailed previously, while hyperventilating for a period of 3 minutes, following the same hyperventilation procedures previously described. Participants were given three 15-second normal breathing breaks, during which they were instructed to continue staring at the center of their shadow.

Procedure

All procedures were approved by the University of Wyoming's institutional review board committee. The first and second author, both master's-level clinicians with extensive training in IE, served as the experimenters. All procedures were scripted for standardization. Each participant completed the following procedures individually in the presence of one experimenter. Following informed consent, participants were screened for medical conditions that would contraindicate participation in IE exercises (e.g., asthma, seizure disorders, heart problems, pregnancy). No participants who responded to the invitation email declined participation during the informed consent process or were excluded because of contraindicated medical conditions. Next, all participants completed a demographics form. Participants then completed the 11 exercises, with the order of exercise completion partially randomized. Specifically, the five most physically strenuous exercises (hyperventilation and spinning exercises) were randomly assigned to the 2nd, 4th, 6th, 8th, and 10th exercise positions, and the six less physically strenuous exercises were randomly assigned to the 1st, 3rd, 5th, 7th, 9th, and 11th exercise positions. This partial randomization procedure was used to reduce the carryover of physical exhaustion to subsequent exercises. After each exercise, participants were asked to verbally rate the extent to which they experienced depersonalization, derealization, and anxiety, with ratings recorded by the experimenter. Following the ratings, participants were instructed to sit quietly for a period of 90 seconds to let their sensations decrease. After all 11 exercises were completed, participants received course credit for their participation and were reimbursed \$10.

RESULTS

As compared to the ASI-3 normative sample reported by Taylor et al. (2007), the present sample reported significantly lower levels of anxiety sensitivity than did panic disorder patients, $t(50) = 7.42, p < .01$; significantly greater levels of anxiety sensitivity than obsessive-compulsive disorder patients, $t(61) = 3.24, p < .01$; and similar levels of anxiety sensitivity as generalized anxiety disorder patients, $t(49) = 0.91, p > .05$. Participants also reported significantly less experience with the symptoms of depersonalization and derealization, as measured by the DDI, than those reported by a sample of panic disorder patients with a history of depersonalization or derealization (Cox & Swinson, 2002), $t(137) = 2.42, p < .02$.

Table 1 presents the mean levels of depersonalization, derealization, and anxiety reported following the 11 exercises. Three repeated-measures analyses of variances were conducted, with exercise type as the within-subject variable, to compare levels of depersonalization, derealization, and anxiety across the exercises. A significant effect of exercise was found for participants' self-report of depersonalization, $F(10, 12) = 9.89, p < .001$; derealization, $F(10, 12) = 5.33, p < .001$; and anxiety, $F(10, 12) = 20.87, p < .001$.

TABLE 1. MEANS (STANDARD DEVIATIONS) FOR THE 11 EXERCISES

	Depersonalization	Derealization	Anxiety
Mirror staring	4.95 (2.34)	3.57 (2.54)	2.52 (2.13)
Dot staring	3.17 (2.72)	3.61 (2.25)	2.08 (2.07)
Spinning	3.17 (1.92)	4.83 (2.33)	3.57 (2.57) ^b
Lightbulb	2.56 (2.39)	3.78 (2.59)	1.91 (2.09)
Stimulus deprivation	3.39 (1.95)	4.78 (2.58)	3.39 (2.33) ^b
Hyperventilation (1 minute)	4.57 (2.00) ^b	4.39 (2.68)	5.31 (2.33) ^c
Hyperventilation (5 minute)	6.26 (2.32) ^b	5.78 (2.21) ^c	6.21 (2.47) ^c
Spiral staring	3.17 (1.95)	4.30 (1.87)	2.48 (2.29)
Hyperventilation plus spiral	5.17 (2.17) ^b	5.65 (2.33) ^c	5.61 (2.27) ^c
Strobe light	3.87 (2.44)	5.35 (2.06) ^c	3.39 (2.39) ^b
Hyperventilation plus strobe	5.74 (2.18) ^b	6.70 (2.20) ^c	6.61 (1.92) ^c

[AuQ1] *Note.* ^a = Significantly ($p < .05$) greater than mirror staring. ^b = Significantly greater ($p < .05$) than dot staring. ^c = Significantly ($p < .05$) greater than mirror staring and dot staring. Depersonalization, derealization, and anxiety ratings ranged from 0 to 10.

The primary goal of the present study was to identify exercises that evoked higher levels of depersonalization or derealization than the mirror or dot staring tasks. In this vein, exploratory post hoc tests were conducted comparing ratings between the mirror and dot staring exercises, respectively, and the nine alternative exercises. Because of our small sample size, the exploratory nature of this study, and our significant omnibus findings, we elected not to statistically control for type I error. Of the 54 post hoc analyses, 23 yielded significantly ($p < .05$) higher depersonalization, derealization, or anxiety ratings for an alternative exercise when compared to mirror or dot staring. Results from these 23 analyses are presented in Table 2.

None of the exercises produced significantly higher levels of depersonalization than staring at a mirror. Conversely, several alternative exercises (hyperventilation plus strobe, hyperventilation plus spiral, hyperventilation 1 minute, and hyperventilation 5 minutes) elicited significantly greater rates of depersonalization than dot staring. In terms of derealization, several alternative exercises (strobe light, hyperventilation plus strobe light, hyperventilation plus spiral, and hyperventilation 5 minutes) evoked significantly greater rates of derealization than staring at a mirror and dot staring. As compared to the mirror exercise, hyperventilation plus strobe, hyperventilation plus spiral, hyperventilation (1 minute), and hyperventilation (5 minutes) produced significantly greater peak levels of anxiety. Finally, as compared to the dot staring exercise, the spinning while wearing prescription glasses, stimulus deprivation, strobe light, hyperventilation plus strobe, hyperventilation plus spiral, hyperventilation (1 minute), and hyperventilation (5 minutes) tasks evoked significantly greater levels of peak anxiety.

DISCUSSION

Several exercises were identified that produced significantly greater levels of depersonalization or derealization than mirror or dot staring tasks, including the strobe light, hyperventilation plus strobe light, hyperventilation plus spiral, hyperventilation (1 minute), and hyperventilation (5 minutes) exercises. From these findings, it can be concluded that hyperventilation, either

TABLE 2. POST HOC TESTS (FISHER'S LEAST SIGNIFICANT DIFFERENCES) OF DIFFERENCES BETWEEN MIRROR AND DOT STARING AND ALTERNATIVE EXERCISES FOR RATINGS OF DEPERSONALIZATION, DEREALIZATION, AND ANXIETY

	<i>t</i> (22)	<i>p</i>	<i>d</i>
Depersonalization			
vs. Mirror staring			
None			
vs. Dot staring			
Hyperventilation plus strobe	3.98	<.001	.83
Hyperventilation plus spiral	3.37	.003	.70
Hyperventilation (1 minute)	2.45	.011	.51
Hyperventilation (5 minutes)	4.60	<.001	.96
Derealization			
vs. Mirror Staring			
Strobe light	3.69	.002	.72
Hyperventilation plus strobe	4.47	<.001	.93
Hyperventilation plus spiral	2.80	.011	.58
Hyperventilation (5 minutes)	3.17	.004	.66
vs. Dot staring			
Strobe light	3.48	.002	.73
Hyperventilation plus strobe	5.12	<.001	1.07
Hyperventilation plus spiral	3.27	.003	.68
Hyperventilation (5 minutes)	3.52	.002	.73
Anxiety			
vs. Mirror staring			
Hyperventilation plus strobe	9.20	<.001	1.92
Hyperventilation plus spiral	5.60	<.001	1.17
Hyperventilation (1 minute)	5.87	<.001	1.22
Hyperventilation (5 minutes)	5.33	<.001	1.11
vs. Dot staring			
Spinning with glasses	2.52	.019	.53
Stimulus deprivation	2.31	.030	.48
Strobe light	2.83	.010	.59
Hyperventilation plus strobe	8.55	<.001	1.78
Hyperventilation plus spiral	6.04	<.001	1.26
Hyperventilation (1 minute)	4.66	<.001	.97
Hyperventilation (5 minutes)	6.49	<.001	1.35

Note. *d* was calculated as the mean of the difference scores divided by the standard deviation of the difference scores (Rosenthal & Rosnow, 1991). For *d*, small = .2, medium = .5, and large = .8 (Cohen, 1977, 1988).

alone or combined with visual stimulation, elicited strong sensations of depersonalization and derealization. Although previous research has established the efficacy of brief hyperventilation in producing episodes of breathlessness, dizziness, and heart palpitations (Antony et al., 2006; Schmidt & Trakowski, 2004), the present findings also highlight its effectiveness in inducing episodes of depersonalization and derealization, especially when conducted in a prolonged manner (i.e., 3–5 minutes).

Although significant differences among exercises did emerge, several limitations of this study deserve attention. First, each measurement of depersonalization, derealization, and anxiety following the induction exercises consisted of a single-item rating scale. Thus, the validity of the dependent measures may be compromised. Because measures of depersonalization, derealization, and anxiety were collected following each of the 11 exercises, we elected to employ a brief single-item measure. In the future, the validity of postexercise ratings may be improved by utilizing a measure that more thoroughly assesses the symptoms of unreality, such as the Acute Dissociation Inventory used by Leonard et al. (1999).

Second, visual stimuli were effective when used alone (strobe light) or in concert with hyperventilation (strobe light and spiral). Because we did not include a 3-minute hyperventilation-only exercise and both exercises where hyperventilation was combined with visual stimulation lasted 3 minutes, it was not possible to determine the additive benefit of using visual stimulation along with hyperventilation. Thus, the experiences reported following the hyperventilation plus strobe or spiral exercises may have been solely a product of the prolonged length of hyperventilation. In the future, it would be useful to standardize exercise duration so that dismantling of the additive effects of combining visual stimuli with hyperventilation would be possible.

Mirror and dot staring, designed and tested specifically to elicit depersonalization and derealization by Miller et al. (1994), were among the least powerful exercises in the present study. The one exception was the ability of mirror staring to reliably evoke depersonalization. That five exercises in the present study were statistically superior to mirror or dot staring, despite the statistical power limitations imposed by a sample size of 23, is notable. Although preliminary, our results suggest that clinicians intending to evoke depersonalization or derealization in their clients via IE might initially employ the hyperventilation (5 minutes, plus strobe, plus spiral) and/or strobe light exercises. This study describes a variety of additional exercises that may be utilized for clients who do not respond to these recommended tasks. Despite the reported group-level differences in mean responses to the exercises, some participants exhibited an idiosyncratic pattern of responding to exercises that were not evident at the group level. This is consistent with clinical reality in which some clients experience only depersonalization and derealization in response to highly specific stimuli (e.g., fluorescent lights).

Many of the exercises examined produced significantly greater levels of anxiety than the mirror and dot staring exercises. It is possible—and perhaps likely—that the anxiety ratings were elevated because of fear of other sensations produced by the exercises. For example, spinning with prescription eyeglasses produced significantly higher anxiety than did staring at a dot, but it did not produce significantly higher rates of either depersonalization or derealization. With respect to spinning with prescription eyeglasses, anxiety ratings may have been driven by the induction of other sensations feared by this sample, including dizziness or nausea. If, in future research, the previously mentioned exercises are tested among a sample of individuals who fear primarily episodes of depersonalization or derealization, then the relative superiority of anxiety ratings will be of greater importance. For the present sample, the superiority of exercises in evoking depersonalization and derealization is of greater importance than the level of anxiety produced. It is expected that the exercises effective in inducing depersonalization or derealization among this analog sample will produce even greater levels of depersonalization or derealization among a clinical sample prone to experiencing such episodes (Leonard et al., 1999; Miller et al., 1994).

Scores on the ASI-3 suggested that our participants had levels of anxiety sensitivity that were less severe than individuals with panic disorder. Accordingly, the extent to which our findings generalize to clinical populations is unclear. Future research should examine the strength of the most powerful exercises from this study for inducing depersonalization, derealization, and anxiety among individuals with panic disorder who report experiencing and fearing episodes of depersonalization or derealization. As suggested by Miller et al. (1994), further investigations are necessary to determine whether the use of depersonalization and derealization IE exercises improves treatment response among panic disorder patients who experience and fear these types of episodes. If subsequent clinical research replicates our findings, clinicians might consider adding one or two exercises to the IE assessment (Schmidt & Trakowski, 2004) to improve treatment planning and outcomes for clients with panic disorder.

NOTE

1. The IE assessment is a list of IE exercises that is completed before the IE component of treatment. The IE assessment aids in determining which exercises may be useful during upcoming exposure sessions. Detailed descriptions of the IE assessment can be found in Antony et al. (2006) and Schmidt and Trakowski (2004).

REFERENCES

- Antony, M. M., Ledley, D. R., Liss, A., & Swinson, R. P. (2006). Response to symptom induction exercises in panic disorder. *Behaviour Research and Therapy*, *44*, 85–98.
- Barlow, D. H., & Craske, M. G. (1988). The phenomenology of panic. In S. Rachman & J. D. Maser (Eds.), *Panic: Psychological perspectives* (pp. 11–35). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Barlow, D. H., & Craske, M. G. (2007). *Mastery of your anxiety and panic* (4th ed.). New York: Oxford University Press.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences* (Rev. ed.). New York: Academic Press.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cox, B. J., & Swinson, R. P. (2002). Instrument to assess depersonalization-derealization in panic disorder. *Depression and Anxiety*, *15*, 172–175.
- Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin*, *99*, 20–35.
- Gould, R. G., Otto, M. W., & Pollack, M. H. (1995). A meta-analysis of treatment outcome for panic disorder. *Clinical Psychology Review*, *15*, 819–844.
- Leonard, K. N., Telch, M. J., & Harrington, P. J. (1999). Dissociation in the laboratory: A comparison of strategies. *Behaviour Research and Therapy*, *37*, 49–61.
- McNally, R. J. (2002). Anxiety sensitivity and panic disorder. *Biological Psychiatry*, *52*, 938–946.
- Miller, P. P., Brown, T. A., DiNardo, P. A., & Barlow, D. H. (1994). The experimental induction of depersonalization and derealization in panic disorder and nonanxious subjects. *Behaviour Research and Therapy*, *32*, 511–519.
- Peterson, R. A., & Reiss, S. (1992). *Anxiety sensitivity index manual* (2nd ed.). Worthington, OH: International Diagnostic Systems.
- Rosenthal, R., & Rosnow, R. (1991). *Essentials of behavioral research: Methods and data analysis* (2nd ed.). Boston: McGraw-Hill.
- Schmidt, N. B., & Trakowski, J. (2004). Interoceptive assessment and exposure in panic disorder: A descriptive study. *Cognitive and Behavioral Practice*, *11*, 81–92.
- Schumaker, J. F., Warren, W. G., Carr, S. C., Schreiber, G. S., & Jackson, C. C. (1995). Dissociation and depression in eating disorders. *Social Behavior and Personality*, *23*, 53–58.

- Taylor, S., & Cox, B. J. (1998). An expanded Anxiety Sensitivity Index: Evidence for a hierarchic structure in a clinical sample. *Journal of Anxiety Disorders, 12*, 463–483.
- Taylor, S., Zvolensky, M. J., Cox, B. J., Deacon, B. J., Heimberg, R. G., Ledley, D. R., et al. (2007). Robust dimensions of anxiety sensitivity: Development and initial validation of the Anxiety Sensitivity Index-3 (ASI-3). *Psychological Assessment, 19*, 176–188.
- Van der Kolk, B. A., Pelcovitz, D., Roth, S., & Mandel, F. S. (1996). Dissociation, somatization and affect dysregulation: The complexity of adaptation to trauma. *American Journal of Psychiatry, 153*, 83–93.

Correspondence regarding this article should be directed to James Lickel, MS, University of Wyoming, Department of Psychology, Department 3415, 1000 East University Avenue, Laramie, WY 82071. E-mail: jlickel@uwyo.edu

[AuQ1] Author: Nothing in this table had been marked with just #, which has been edited to a per APA style. Please insert # where needed or reorder the notes and their superscript references as needed to account for the deletion of the # note.