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A PSYCHOLOGICAL BIATHLON: THE RELATIONSHIP BETWEEN LEVEL OF EXPERIENTIAL AVOIDANCE AND PERSEVERANCE ON TWO CHALLENGING TASKS

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The degree to which experiential avoidance may represent a functional response class was examined by comparing the perseverance of participants displaying high versus low levels of experiential avoidance, as assessed by the Acceptance and Action Questionnaire (Hayes et al., 2004), during a "psychological biathlon" consisting of 2 challenging tasks that previously had only been studied separately. Consistent with previous research, high avoidant participants were less tolerant of pain and were outperformed by low avoidant participants during a distress-inducing perceptual–motor task. The 2 groups of participants also differed significantly from each other on a composite perseverance measure derived from standard scores on each of the separate tasks, suggesting that experiential avoidance operates as a functional response class. We discuss implications of the findings for the assessment, further investigation, and conceptualization of experiential avoidance as a core process that supports diverse forms of human suffering and dysfunctional behavior.
Key words: experiential avoidance, functional response class, distress tolerance

Experiential avoidance refers to efforts to regulate the nature, length, or occurrence of negative private events (thoughts, feelings, somatic sensations, memories, etc.) and the contexts in which they occur (Blackledge & Hayes, 2001). Investigations of experiential avoidance as a purported core pathogenic process that contributes to both clinical and subclinical levels of dysfunctional behavior (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996) have understandably increased with the emergence of acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999) and other related interventions that seek to target it. While some ACT researchers have developed and analyzed context- or disorder-specific measures of experiential avoidance (e.g., Gifford et al., 2004; Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007; Lillis & Hayes, 2008), experiential avoidance has been more broadly and commonly construed as a transdiagnostic process and accordingly assessed at a molar level with the Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004).

From a contextualistic perspective, it seems much more useful to think and speak of experiential avoidance as a functional response class that may account for comorbidity among topographically diverse forms of psychopathology, rather than as a hypothetical construct (Gird & Zettle, 2009). However, with relatively few exceptions (Brown,

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Lejuez, Kahler, Strong, & Zvolensky, 2005), to date there appears to have been little directed effort to provide empirical support for such a behavior analytic conceptualization of experiential avoidance. The purpose of this study was to investigate the degree to which experiential avoidance may represent a functional response class by comparing the aggregate performance of participants displaying differing levels of it during a pair of challenging tasks. Specifically, we presented participants reporting high versus low levels of experiential avoidance, as assessed by the AAQ, with two tasks that had each previously been the focus of their own separate studies. One of these challenging tasks was the cold pressor (Zettle et al., 2005), and the other was a perceptual–motor task that involved rapidly sorting colored straws while wearing "drunk goggles" (Zettle, Petersen, Hocker, & Provines, 2007).

A functional response class has typically been conceptualized as a set of behaviors that differ from each other in their form or topography but serve the same function (Barrett, Johnston, & Pennypacker, 1986; Millenson & Leslie, 1979). For example, diverse types of self-stimulatory behaviors displayed by developmentally disabled populations may be shaped and maintained by the similar perceptual consequences they produce (Lovaas, Newsom, & Hickman, 1987). As a purported functional response class, experiential avoidance likewise may take various forms, such as rumination and substance abuse, yet have the shared effect of minimizing psychological contact with unwanted private events and the contexts in which they occur (Hayes et al., 1996).

An increasing number of laboratory studies have documented that participants differing in levels of experiential avoidance as assessed by the AAQ generally differ predictably in their reactions to both psychological and biological challenges designed to simulate or induce clinically relevant phenomena. High avoiders have been shown to take longer to produce unpleasant images (Cochrane, Barnes-Holmes, Barnes-Holmes, Stewart, & Luciano, 2007) and to report higher levels of negative emotion in response to them (Sloan, 2004) than have their low avoidant counterparts. Similar conceptual findings also have emerged from comparing participants reporting high versus low levels of experiential avoidance in their responses to a variety of induced unpleasant experiences ranging from panicogenic symptoms (Karekla, Forsyth, & Kelly, 2004) and dizziness and blurred vision (Zettle et al., 2007) to dysphoric mood (Gird & Zettle, 2009) and acute pain (Zettle et al., 2005).

At an aggregate level, the converging findings across such separate studies can be regarded as one level of empirical support for viewing experiential avoidance as a functional response class. Our purpose for this study, however, was to subject this conceptualization to a more rigorous evaluation by comparing the performance of participants differing in their levels of experiential avoidance during a pair of challenging tasks presented within the same study rather than across different studies conducted by different investigators with different participants. More specifically, we presented participants with a psychological biathlon consisting of the cold pressor test as well as a perceptual–motor task designed to induce unwanted sensations, such as disorientation and nausea. Just as the two distinct events that compose the biathlon in the Winter Olympics (i.e., target shooting and cross-country skiing) can be seen as independent tests of skills in their own right, the two different challenges we presented to participants have been shown separately in two earlier studies (Zettle et al., 2005, 2007) to function as tests of experiential avoidance. Accordingly, we expected to replicate the results of our two previous studies. More specifically, we anticipated that participants reporting high levels of experiential avoidance would display lower pain tolerance and resort to more dysfunctional coping strategies during the cold pressor test than would low avoiders, despite the similarity of these two groups in their sensitivity to pain and in their ratings of its intensity. On the perceptual–motor task, we expected that high avoiders would correctly sort fewer straws while wearing drunk goggles and would be more distressed by unpleasant sensations induced during the task than would their low avoidant counterparts.

We were primarily interested not in the separate findings from the two tasks but in examining how the two groups of participants might differ from each other in a composite score that reflects their aggregate perseverance during them. Medal-winning Olympic biathletes typically finish ahead of their competitors not by just skiing cross-country faster or shooting more accurately but by outperforming them on both disciplines. By the same reasoning, we expected that our two groups of participants would differ significantly in their aggregate, or combined, performance during our psychological biathlon if experiential avoidance, like athleticism, constitutes a functional response class.

Method

Participants

Participants ($N = 60$) were university students enrolled in psychology classes and part of a larger sample who completed an online administration of the AAQ. The same cutting scores used in prior research (e.g., Feldner, Zvolensky, Eifert, & Spira, 2003; Gird & Zettle, 2009; Karekla et al., 2004; Zettle et al., 2005) identified participants from this larger pool reporting high (AAQ ≥ 41) or low (AAQ ≤ 26) levels of experiential avoidance. Students meeting this selection criterion were informed via e-mail of their eligibility and invited to participate. Exclusionary criteria for further participation included color blindness and the presence of any medical conditions that might be exacerbated by participating in the cold pressor task (e.g., Raynaud's disease) or straw-sorting task (e.g., Meniere's disease). All participants were treated in accordance with the American Psychological Association's (2002) Ethical Principles of Psychologists and Code of Conduct.

The final sample comprised two groups, one high in experiential avoidance ($n = 30$) and another low in experiential avoidance ($n = 30$), that did not differ significantly from each other in gender distribution (18 females and 12 males vs. 17 females and 13 males) or handedness (28 dextral and 2 sinistral vs. 25 dextral and 5 sinistral). Establishing equivalence between the two groups in handedness seemed particularly relevant because only the left hand was immersed during the cold pressor test. The two groups did differ from each other in age. Similar to the sample of Zettle et al. (2007), high avoidant participants ($M = 22.1$ years) were significantly younger, $t(58) = 2.52$, $p = .014$, than their low avoidant counterparts ($M = 26.8$ years). We did not track the racial/ethnic status of participants but did administer a brief background questionnaire prior to introduction of the tasks to ensure that the two groups did not differ on any additional variables that we suspected might influence performance. This further assessment revealed no differences between the two groups in height; time elapsed since consumption of the last meal; ratings of visual acuity and wearing of corrective lenses; past episodes of vertigo, motion sickness, or other inner ear–related problems; or frequency with which they reported previous impairment of vision or motor skills due to inebriation.

Questionnaires

Acceptance and Action Questionnaire (AAQ). The AAQ is a nine-item self-report measure of experiential avoidance (Hayes et al., 2004). Respondents use a 7-point scale to rate "the truth ... as it applies to you" of statements designed to evaluate aspects of psychological acceptance (e.g., "I'm not afraid of my feelings") versus experiential avoidance (e.g., "Anxiety is bad"). Total scores range from 9 to 63, with higher scores reflecting greater levels of experiential avoidance. Because of an oversight coupled with the online administration of the AAQ, we were unable to determine the reliability of the AAQ within our study's sample.[1] However, the level of internal consistency of the AAQ (Cronbach's

1 The electronic system used in administering the AAQ places a limited hold on the data. We were able to retrieve total scores from the AAQ before it expired but not individual item responses, which were necessary to assess the scale's internal consistency.

α = .70) reported by Hayes et al. (2004), as well as that calculated from a comparable sample of student participants that we recently selected for another project (Cronbach's α = .80), suggests that the AAQ displays sufficient reliability for use in research. Significant correlations between the AAQ and other purported measures of experiential avoidance, such as the White Bear Suppression Inventory (Wegner & Zanakos, 1994) and the Dissociative Experiences Scale (Bernstein & Putnam, 1986), provide further support for its psychometric properties.

Coping Strategies Questionnaire (CSQ). The CSQ was initially constructed to assess seven different strategies (diverting attention, reinterpreting sensations, coping self-statements, ignoring sensations, praying/hoping, catastrophizing, and increasing behavioral activity) used by patients in coping with chronic pain (Keefe, Crisson, Urban, & Williams, 1990). Participants who completed the cold pressor last were administered a 36-item version of the CSQ that was modified by Geisser, Robinson, and Pickren (1992) for use with this task. This version of the CSQ was identical to that used in an earlier study on induced pain (Zettle et al., 2005) in that any items that loaded on the Increasing Behavioral Activity subscale were deleted. Respondents used a rating scale of 0 (*never did that*) to 6 (*always did that*) to indicate how much they engaged in a particular activity to cope with pain during the cold pressor task. Research suggests that the subscales of the CSQ possess adequate levels of internal consistency, with alpha coefficients ranging from .71 (Rosenstiel & Keefe, 1983) to .89 (Keefe et al., 1987). However, unlike in our earlier study (Zettle et al., 2005), we found the reliability of the Praying/Hoping subscale to be unacceptably low (Cronbach's α = .56) and, for this reason, it was not further analyzed. The levels of internal consistency for the remaining five subscales were sufficiently high, ranging from .75 (Reinterpreting Sensations) to .88 (Catastrophizing).

Task-Related Measures

Various measures were taken to reflect the response of participants to the two tasks that composed our psychological biathlon.

Cold pressor task. The same pain-related measures that were analyzed by Zettle et al. (2005)—(a) threshold, (b) tolerance, (c) endurance, and (d) intensity—were obtained during or immediately after presentation of the cold pressor. Using a stopwatch, we measured pain threshold as the length of immersion time in the icy water until each participant reported pain and pain tolerance as the total amount of time each participant's hand remained in the water. We calculated pain endurance by subtracting the threshold from the tolerance measure to reflect how long each participant kept his or her hand immersed in the water after indicating it was painful. Finally, we assessed pain intensity by asking participants immediately after they had removed their hand from the water to rate the intensity of experienced pain during the task by placing a vertical mark along a 100-mm visual analogue scale (where 0 mm = *no pain* and 100 mm = *worst possible pain*).

Perceptual–motor task. As in our earlier study (Zettle et al., 2007), we measured performance during the challenging perceptual–motor task by counting how many colored straws participants sorted correctly and in total while wearing drunk goggles. In addition, immediately after conclusion of the task, we asked participants to provide a series of ratings about various sensations they had experienced during the task. Specifically, participants were requested to use a scale of 0 to 100 to rate separately their experiences of dizziness, blurred vision, disorientation, headache, and nausea along the dimensions of valence (positive vs. negative) and distress level.

Composite Measure

We calculated a composite measure to quantify the aggregate perseverance of participants during the biathlon by collapsing across key measures derived separately from each of the two tasks. We first determined separate standard (*z*) scores for each participant based on pain tolerance displayed during the cold pressor task and number of straws sorted

correctly during the perceptual–motor task. We then added these two standard scores together to obtain a composite performance measure for each participant.

Procedure

The order in which the two tasks were presented to participants was counterbalanced. The only difference between the two sequences was that the CSQ was only administered after the cold pressor when this task was presented last. This was to avoid suggesting coping strategies that participants might use during the straw-sorting task. Otherwise, we followed the same procedures used in our earlier studies to present the cold pressor (Zettle et al., 2005) and perceptual–motor tasks (Zettle et al., 2007). Because these tasks have been described extensively in previous articles, we will only provide a brief depiction of the two here and suggest that interested readers consult the two referenced studies for additional details.

Cold pressor task. For the cold pressor task, we required participants to immerse their left hand in a container of water at 68 °F for 2 min before placing it into an adjacent container of icy water maintained at 40 °F while the following instructions were delivered:

> Please place your left hand into the icy water at least up to your wrist. Please say "painful" when the cold sensation first becomes painful to you and try to hold your hand in the water as long as possible. Although we would like you to try to hold your hand in the water as long as possible, the decision of when to remove it is entirely up to you.

After 5 min of immersion, any participants who had not yet withdrawn their hand were asked to do so and their tolerance measures were recorded as 300 s. As previously mentioned, pain intensity ratings were then collected and the CSQ was administered to those participants who completed the cold pressor task last.

Perceptual–motor task. During this task, participants were asked to sort as many different colored straws as possible into various colored containers mounted on an easel. In order to make the task challenging, participants were required to do so while spinning themselves in a swivel chair and wearing a modified pair of Drunk Busters Impairment Goggles designed to simulate the effects of a blood alcohol level of .08 to .15. The following instructions were presented to participants before they began the task to provide an incentive for task performance:

> Although we would like you to continue the task to the best of your ability as long as possible, you may decide to discontinue your participation at any time. As an incentive to perform as well as possible on the task, we are offering a $20 prize at the end of this project for the participant who correctly sorts the most straws. In addition, you will earn one chance for each straw sorted correctly during the task towards another $20 prize to be awarded at the conclusion of the project.

The task was discontinued after 5 min, at which point participants were immediately asked to provide the series of experiential ratings described earlier.

Results

Because the only significant difference between the two groups of participants among the background variables was in their average age, we first determined whether age needed to be treated as a covariate in analyzing the task-related and composite measures. The only significant correlation coefficient between age and any of these other measures was found with respect to rated valence of nausea during the straw-sorting task, $r = .59$, $p = .04$. For this reason, we did not hold age as a covariate in any subsequent analyses.

Cold Pressor Task

Pain-related measures. We considered conducting a multivariate analysis of variance on the four pain-related measures associated with the cold pressor task but opted against it because of divergent hypotheses concerning them. Although we expected higher levels of tolerance and endurance for low avoidant participants, we anticipated no significant differences in the threshold and sensitivity to pain measures. Consequently, we conducted a series of 2 (avoidance level) × 2 (task order) analyses of variance (ANOVAs), with the results presented in Table 1. There were no significant main effects for task order or interactions between task order and avoidance level for any of the measures. As expected and consistent with findings from our earlier study with the cold pressor task (Zettle et al., 2005), significant main effects for avoidance level were found for the tolerance and endurance measures. Both differences represent medium effect sizes (cf. Kittler, Menard, & Phillips, 2007). As can be seen in Table 2, participants high in experiential avoidance removed their hands from the icy water on average after approximately a minute and a half (98 s) total and after just over a minute (69 s) had elapsed since they indicated that they were experiencing pain. In contrast, their low avoidant counterparts on average tolerated the icy water (172 s) and endured pain induced by the cold pressor (124 s) for nearly twice as long. As anticipated, the two groups of participants did not vary from each other in either their thresholds or sensitivity to pain, although differences on the latter measure fell just short of being statistically significant ($p = .06$).

Table 1
Analyses of Variance for Task-Related Measures

Measure	$F(1, 56)$	p	η_p^2
Pain-related measures			
Threshold			
Avoidance	1.60	.21	.03
Order	.01	.92	.00
Avoidance × Order	.91	.35	.02
Tolerance			
Avoidance	6.44	<.01[a]	.10
Order	.00	.95	.00
Avoidance × Order	.35	.55	.00
Endurance			
Avoidance	3.97	.03[a]	.07
Order	.02	.90	.00
Avoidance × Order	.01	.92	.00
Intensity			
Avoidance	3.67	.06	.06
Order	.06	.80	.00
Avoidance × Order	.01	.94	.00
Number of straws sorted correctly			
Avoidance	3.84	.03[a]	.06
Order	.08	.78	.00
Avoidance × Order	2.07	.16	.04
Composite measure			
Avoidance	9.73	<.001[a]	.15
Order	.06	.82	.00
Avoidance × Order	.35	.56	.01

[a]One-tailed test of significance.

Table 2
Means and Standard Deviations of Task-Related Measures

	Level of experiential avoidance	
Measure	Low	High
Pain-related measures		
Threshold[a]	48.2 (70.5)	28.6 (45.7)
Tolerance[a]	172.5 (122.2)	98.0 (101.1)
Endurance[a]	124.3 (114.4)	69.4 (94.5)
Intensity[b]	48.7 (21.8)	59.2 (19.6)
Number of straws sorted correctly	31.8 (7.6)	27.5 (9.2)
Composite measure[c]	.56 (1.5)	−.56 (1.3)

[a]Data are presented in seconds. [b]Data are presented in millimeters. [c]Data are presented in standard (*z*) scores.

Coping strategies. The other measures analyzed in conjunction with the cold pressor task were obtained from the CSQ. Because the CSQ was administered only to participants who completed the cold pressor task last, main effects for task order and interactions between task order and avoidance level were precluded. Accordingly, we analyzed the five CSQ subscales with a series of *t* tests, while minimizing experiment-wise error rate by adopting a *p* value of .01 (Jacobs, 1976). The findings, presented in Table 3, roughly parallel those from our earlier study (Zettle et al., 2005). Specifically, a medium effect size was obtained for catastrophizing, with high avoidant participants reporting using it as a coping strategy during the cold pressor task to a greater, although not statistically significant, degree than those low in experiential avoidance. There were no differences between the groups in their self-reported use of the other four coping strategies.

Table 3
Analyses of CSQ Subscales

	Level of experiental avoidance				
Subscale	Low	High	*t*(28)	*p*	η_p^2
Diverting Attention	7.1 (8.0)	11.2 (10.1)	1.22	.23	.00
Reinterpreting Sensations	11.1 (10.8)	10.3 (9.9)	.21	.83	.00
Coping Self-Statements	20.7 (10.9)	20.3 (9.8)	.12	.90	.00
Ignoring Sensations	14.9 (9.8)	14.6 (8.8)	.10	.92	.00
Catastrophizing	6.4 (8.7)	12.6 (9.5)	1.87	.04[a]	.11

Note. Parenthetical data are standard deviations.
[a]One-tailed test of significance.

Perceptual–Motor Task

Straw-sorting measure. No participants opted to discontinue the task prematurely. The correlation between the total number of straws sorted and number sorted correctly was exceedingly high (r = .99), as participants in both the low avoidant and high avoidant groups were equally skilled in correctly sorting a high percentage of the straws (98% vs. 96%, respectively). For this reason, only the number of straws sorted correctly was analyzed. As denoted in Table 2 and consistent with our earlier findings using this same task (Zettle et al., 2007), low avoidant participants correctly sorted more total straws with a medium effect size. Similar to the results for the cold pressor task, there were no main effects for task order or for its interaction with avoidance level.

Experiential ratings. A second set of data garnered from the perceptual–motor task involved participant ratings of various sensations induced while sorting the straws. As can be seen in Table 4, the most common sensations experienced during the task were blurred vision and disorientation, reported by 87% and 78% of participants, respectively. Appreciably less common were reports of headache and nausea. We opted for a series of Mann–Whitney tests (Siegel, 1956) in analyzing the ratings for several reasons. One, as just noted, not all participants reported experiencing the full range of sensations, leading to "missing data." Second, there were also likely violations of assumptions required for parametric analyses, such as *t* tests. Finally, it is doubtful that the rating scales represented interval scaling (Siegel, 1956).

Table 4
Analyses of Experiential Ratings

	Valence[a]						Distress level[b]					
	Low avoidant		High avoidant				Low avoidant		High avoidant			
Type of sensation	*M*[c]	*n*[d]	*M*[c]	*n*[d]	*U*	*p*[e]	*M*[c]	*n*[d]	*M*[c]	*n*[d]	*U*	*p*[f]
Dizziness	65.0	16	69.6	14	101	.64	26.3	16	49.3	14	68	.03
Blurred vision	68.5	27	79.0	25	280	.28	47.7	27	54.0	25	297.5	.23
Disorientation	57.4	25	67.3	22	210	.15	41.4	25	52.3	22	217.5	.11
Headache	62.5	4	67.5	4	7.5	.87	22.5	4	37.5	4	5.5	.23
Nausea	57.1	7	50.0	5	13.5	.49	15.7	7	41.0	5	7.5	.05

[a]Participants were asked to rate the degree to which the overall sensation was positive (pleasant) or negative (unpleasant) on a scale of 0 (*very positive*) to 100 (*very negative*). [b]Participants were asked to rate how distressful they found each sensation on a scale of 0 (*not distressful at all*) to 100 (*extremely distressful*). [c]Mean ratings (0–100) for low and high avoidant groups. [d]Number of participants out of 30 in each group who rated the sensation on the dimension specified. [e]Two-tailed test of statistical significance. [f]One-tailed test of statistical significance.

Consistent with our earlier findings using the same task (Zettle et al., 2007), the two groups of participants did not differ from each other in the likelihood of encountering various sensations during the straw-sorting task or in their ratings of the valence of such experiences. As can be seen in Table 4, with the exception of nausea, which was rated by five high avoidant participants (with a mean rating of 50), all the sensations were rated on the unpleasant end of the valence scale by both groups. However, the two groups did, as anticipated, differ in how distressful they found the sensations to be. As indicated in Table 4, high avoidant participants reported being more distressed by dizziness and nausea than did their low avoidant counterparts.

Composite Measure

Table 1 reports the ANOVA findings on the composite perseverance measure that consisted of each participant's standard scores on the tolerance measure from the cold pressor task and number of straws sorted correctly from the perceptual–motor task. The results paralleled those from the two separate tasks in obtaining a large effect size for avoidance level and no significant effect for task order or its interaction with avoidance level. As reported in Table 2, low avoidant participants predictably outperformed those high in experiential avoidance during the biathlon.

Discussion

Our major purpose in conducting this study was to further evaluate the degree to which experiential avoidance appears to operate as a response class. In our view, the overall findings provide further, although far from definitive, support for such a

behavior analytic view of experiential avoidance. One strand of empirical support for this conceptualization comes from the successful replication of results from our two previous studies (Zettle et al., 2005, 2007) that separately evaluated the two tasks that made up our psychological biathlon.

The findings from the cold pressor task duplicated those from an earlier study (Zettle et al., 2005) in documenting greater perseverance during the task by participants who reported low levels of experiential avoidance as assessed by the AAQ. Specifically, low avoiders kept their hands immersed in the icy water longer, as revealed by both the tolerance and endurance measures, despite not differing from their high avoidant counterparts in their sensitivity to pain, as assessed by the threshold measure. We found, as in our earlier study, that the low avoidant group rated their pain as less intense, but in both instances the difference fell just short of that required for statistical significance.

It is possible that the greater perseverance in the face of pain displayed by participants with low experiential avoidance might simply be attributed to these participants' finding the sensations induced by the cold pressor task to be less painful. This interpretation, however, overlooks the results of the CSQ that in our opinion provide an equally, if not more, plausible explanation for the tolerance and endurance differences. Consistent with our earlier results (Zettle et al., 2005), high avoiders reported using catastrophizing as a coping strategy during the cold pressor task to a greater degree than did the low avoiders. We found in our previous study that the high avoidance group also indicated resorting to praying and hoping more than did participants in the low avoidance group. Unfortunately, we were not able to replicate the latter finding because of an unacceptably low level of internal consistency for this subscale of the CSQ among the current study's participants.

The findings from the perceptual–motor task, in which participants sorted colored straws as quickly as possible while wearing drunk goggles, also paralleled those from our earlier research (Zettle et al., 2007). Although the overall results did not replicate our previous findings as closely as did the results of the cold pressor task, we see them as also lending further support for experiential avoidance as a functional response class. This is particularly so when viewed within the broader context of similar findings from other laboratory studies comparing low versus high experiential avoiders on various challenging tasks (Cochrane et al., 2007; Gird & Zettle, 2009; Karekla et al., 2004; Sloan, 2004).

In the current study, as in our previous one, low avoiders correctly sorted significantly more straws. We view this difference as a reflection of greater perseverance during the task insofar as contact with the unpleasant sensations induced during it could be most effectively minimized by slowing down and thereby sorting fewer straws. High avoiders apparently followed this strategy even though they were no more likely to experience unpleasant sensations or to rate them as unpleasant. The lack of any differences in valence ratings for the two groups is a slight departure from our previous findings (Zettle et al., 2007), in which high avoiders rated blurred vision as significantly more unpleasant.

Also, in the current study, there were fewer group differences in subjective distress surrounding the induced sensations. Specifically, high avoiders in the initial study (Zettle et al., 2007) rated dizziness, blurred vision, and disorientation as more distressing. In this study, they again rated dizziness, as well as nausea, as more distressing than did the low avoidant group. Despite these minor discrepancies across the two studies, the aggregate findings on the distress ratings are consistent with those documented by others (Feldner et al., 2003; Gird & Zettle, 2009) in telling a seemingly coherent story, namely, that groups of participants distinguishable in their levels of experiential avoidance as measured by the AAQ differ in expected ways if what is being assessed by this instrument functions as a response class.

In our view, however, the more compelling empirical support for this conceptualization of experiential avoidance as a functional response class comes from our analysis of the composite measure. The low avoidant group not only outperformed high avoidant participants on both separate tasks with medium effect sizes on each but also outdistanced

them to an even greater degree (as revealed by a larger effect size) when their scores for each were combined into the composite measure. In short, in our psychological biathlon, low avoiders displayed greater overall perseverance as well as greater perseverance separately during both the cold pressor and the straw-sorting tasks, just as biathlon medal winners in the Winter Olympics finish ahead of their competitors by both skiing faster and shooting more accurately.

Despite our view that the findings of our biathlon are perhaps the strongest supportive evidence to date for regarding experiential avoidance as a functional response class when evaluated with laboratory tasks, we would be remiss if we failed to acknowledge some of our study's limitations. One is that the two tasks that composed the biathlon, while seemingly different in their demands, may have been too similar in the types of unwanted experiences they induced to provide the most rigorous evaluation of experiential avoidance. That is, both the cold pressor task and the straw-sorting task were alike in presenting participants with unpleasant bodily sensations. A more stringent test of experiential avoidance as a functional response class might be to present two tasks that induce unwanted psychological experiences that are more disparate in nature. For example, an alternative biathlon could be presented in which the cold pressor task is paired with a procedure in which an unpleasant affective state, such as anxiety (e.g., Cochrane et al., 2007) or dysphoric mood (Gird & Zettle, 2009), is induced in addition to acute pain.

Another, albeit opposing, concern about the biathlon tasks is that they may have been too dissimilar in their contingencies surrounding task performance. As in our earlier study (Zettle et al., 2007), the perceptual–motor task established a conflict between behavioral persistence and experiential avoidance by offering a cash incentive for sorting the most straws and a chance to win a $20 prize for each straw sorted correctly. However, we did not offer any similar rewards on the cold pressor task, unlike some other researchers who have offered incentives for perseverance during pain-inducing challenges (e.g., Gutierrez, Luciano, Rodriguez, & Fink, 2004; Luciano et al., 2010; McMullen et al., 2008; Paez-Blarrina et al., 2008). Although obtaining comparable medium effect sizes on two tasks that differed in their contingencies can be seen as evidence for the robustness of experiential avoidance, it can also be argued that such differences preclude a "cleaner" evaluation of experiential avoidance as a functional response class. To do so, an incentive similar to that operative during the perceptual–motor task could be extended to the cold pressor task. Alternatively, no rewards could be offered for performance on either task.

Another limitation of our current study is that it only compared low versus high avoidant groups on two tasks. It could be argued that a triathlon is a more rigorous evaluation of athleticism than a biathlon, that the pentathlon is even more stringent, and that the decathlon provides the ultimate test of athleticism. By this same logic, it might be possible to add a third experience, like those just suggested that induce unwanted affective states, to our biathlon. However, for both practical and ethical reasons, a psychological pentathlon seems prohibitive and we find it hard to imagine that an institutional review board would approve of a study in which participants are presented with 10 different challenges.

A final shortcoming of this study is the degree to which its findings may be generalizable to clinical populations and issues. This study and others like it are presumably conducted not only to document how college students respond to various challenging laboratory tasks, such as having their hands immersed in icy water, but also because the findings generated help support and inform the conceptual model upon which ACT is based (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Further development of both paper-and-pencil and behavioral measures of general, as well as context- or disorder-specific, forms of experiential avoidance would seem to be invaluable in this larger endeavor. From this perspective, the ultimate test of whether experiential avoidance operates as a functional response class is unlikely to come from the basic research laboratory, but from the clinic. One potentially fruitful area for additional clinical investigation involves the use of ACT in treating comorbid disorders (e.g., Petersen & Zettle, 2009). Documenting that

treatment-induced reductions in experiential avoidance mediate therapeutic improvement in seemingly disparate disorders, such as major depression and alcohol abuse, would perhaps provide the most powerful supporting evidence of experiential avoidance's status as a functional response class.

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