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Does timeframe adjustment of the Life Orientation Test-Revised assess optimism as a state?:

Data from the PEACE-III trial in patients with heart disease

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Abstract

Optimism is prospectively associated with superior health outcomes in cardiac patients, making it an attractive target for well-being interventions in this population. However, optimism measured by the Life Orientation Test-Revised (LOT-R) has largely been considered a static, dispositional construct. Among 125 patients with a recent acute coronary syndrome who received a positive psychology intervention, we assessed the properties of a modified LOT-R that changed the timeframe of items from general dispositional statements to queries about 'right now.' We aimed to learn whether this modified LOT-R was more dynamic than the original LOT-R via administration of both instruments at three timepoints over the 16-week study period. Contrary to our hypothesis, this modified LOT-R showed no greater change in mean score or intra-individual variance than the original LOT-R over 16 weeks. This suggests that simply changing the timeframe of the LOT-R may not facilitate assessment of more state-like optimism in medical patients.

Optimism, having favorable generalized expectations about the future (Carver, Scheier, & Segerstrom, 2010), has been prospectively associated with lower rates of incident heart disease (Tindle et al., 2009), and among those with existing heart disease, with lower rates of adverse medical events (DuBois et al., 2015; Ronaldson et al., 2015). These connections between optimism and cardiovascular health have raised questions about whether optimism is modifiable and could be the target of an intervention to improve outcomes among people with heart disease.

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The most frequently used measure of optimism, the Life Orientation Test-Revised (LOT-R (Scheier, Carver, & Bridges, 1994) was designed as a dispositional measure of optimism. The LOT-R utilizes no specified timeframe in its item wording, using stems such as “in general,” and “usually,” and optimism as measured by the LOT-R is expected to remain stable over time and situation (Carver et al., 2010). This measure, consistent with its focus on trait optimism, has relatively good test-retest reliability over time (Bredal & Ekeberg, 2016; Carver et al., 2010), and in medical populations has remained stable even in the context of cancer diagnosis (Bredal & Ekeberg, 2016) and well-being interventions to promote positive psychological well-being in patients with heart disease (Huffman, Millstein, et al., 2016).

However, optimism is considered by some to be a more dynamic and modifiable construct (Kluemper, Little, & Degroot, 2009; Luthans & Youssef, 2007). Future expectations can be modified by life events and internal changes (Carver, Scheier, & Segerstrom, 2010), and such changes could be both measurable and predictive of health outcomes. Optimism has been found to fluctuate based on levels of self-esteem, confidence, social resources, and controllable versus uncontrollable outcomes (Carver et al., 2010; Segerstrom, 2007; Sweeny, Carroll, & Shepperd, 2006). Related constructs such as attributional style have been examined and measured (Carver, 1989; Whitley, 1991) and shown to be potentially more malleable (Ball, McGuffin, & Farmer, 2008). Further, interventions on cognitive reappraisals and life transitions have demonstrated change in optimistic attributions (Carver & Scheier, 2014; Malouff & Schutte, 2017; Seligman, Rashid, & Park, 2006). Still, attempts to specifically measure optimism as a more state-based phenomenon has been limited. Given that optimism has been shown to change over time and context, and since optimism is so strongly related to health, the ability to measure it as a dynamic state is important. A specific measure capable of capturing change in optimism seems particularly useful in the development of positive psychological interventions, as such interventions often utilize exercises that specifically promote optimism.

One simple method of measuring state-based optimism has been to change the timeframe of the LOT-R from a general timeframe to a present-moment focus such as, “at this moment” and “right now,” without changing the core wording of items (Kluemper et al., 2009). This has the advantage of utilizing items from a concise scale that has, as a trait measure, been validated in numerous populations.

If such a modified, state-based LOT-R were to be more dynamic and modifiable in patients with medical illness than the original LOT-R, it could serve as an important outcome measure for intervention trials of well-being-focused interventions in such populations, especially if this modified LOT-R is also predictive of superior behavioral and medical outcomes. However, this modified LOT-R has not been concurrently compared to original LOT-R responses within the same cohort, and we are aware of no prior attempts to utilize this modification of the LOT-R in a medical context to capture more immediate and potentially dynamic (‘state’) optimism.

Accordingly, to explore the properties and responsiveness to change of this modified version of the LOT-R, we administered both the modified (‘state’) and original (‘trait’) LOT-R

during study assessments (at baseline, and 8 and 16 weeks) as part of a positive psychology (PP) intervention study (Huffman et al., 2017) in patients recovering from an acute coronary syndrome (ACS). We aimed to: (a) assess differential responses to the scale items between the two scales (i.e., to assess whether participants were largely responding identically to the same items in the modified and original LOT-R or whether participants provided different responses), (b) to assess the magnitude of overall mean change in the modified LOT-R scale over 16 weeks, compared to the original LOT-R and other psychological measures in the study, and (c) to compare within-participant changes over time in the modified LOT-R compared to the original LOT-R.

To provide context for findings related to the two LOT-R measures, and to more comprehensively assess changes in positive psychological constructs over 16 weeks in this sample, we also examined changes in positive affect, a state-based construct, as measured by the Positive And Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) positive affect items. If the modified LOT-R does not change substantially over 16 weeks, examination of the PANAS will allow us to better understand whether this is an issue related to the sample (i.e., if PANAS also does not change, it may be that the participants did not experience substantial change in psychological states overall) or to the measure (if the PANAS does change substantially, it suggests that the modified LOT-R may not be responsive to change).

Our primary hypothesis was that the modified LOT-R would have greater mean overall scale and intraparticipant change over time than the original LOT-R, with the magnitude (i.e., effect size [ES]) of change over time similar to our state-based scale of positive affect (PANAS) utilized in the trial.

Methods

Overview

The PEACE-III (Positive Emotions after Acute Coronary Events-III) study was a factorial design trial of a positive psychology (PP)-based intervention in 128 patients recently hospitalized for ACS (myocardial infarction or unstable angina). Study design and main results have been detailed previously (Celano et al., 2018, in press; Huffman et al., 2017). In this factorial design trial, all participants received an 8-week, phone-based PP-based intervention that utilized a written treatment manual and weekly phone sessions with study trainers, with modifications of intensity (completing PP exercises daily or weekly), duration (booster sessions for 8 weeks following the intervention, or no boosters), and content (with or without the addition of motivational interviewing to sessions) assigned randomly, creating a total of 8 study conditions.

Overall, across all conditions, the intervention was associated with significant pre-post improvements in self-reported health behavior adherence, positive affect, depression, and anxiety (Celano et al., 2018, in press). There were also statistically significant improvements in optimism as measured by the original LOT-R, though the magnitude of this change was substantially smaller than for other psychological measures (ES [Cohen's *d*] of improvement from baseline=.25 for the LOT-R compared to ES=.46-.60 for other psychological measures

at 16 weeks). For example, positive affect, measured via the PANAS positive affect items, improved by d=.59. Institutional Review Board approval was obtained at both study sites prior to initiation of study procedures, the study was registered at clinicaltrials.gov (identifier: NCT02754895), and full written informed consent was obtained for all participants.

Procedures

Baseline participant sociodemographic and medical characteristic data were collected at enrollment via participant report and medical chart review (Table 1). In the trial, participants completed self-report study assessments at baseline (in hospital, prior to randomization to one of the active study interventions), 8 weeks, and 16 weeks by study staff blinded to study condition. For optimism, the original LOT-R was utilized. For positive affect, the positive affect items from the Positive and Negative Affect Schedule (PANAS) were used, and for depression/anxiety the relevant subscales of the Hospital Anxiety and Depression Scale (HADS; HADS-A and HADS-D) were utilized.

In addition, participants completed a modified version of the LOT-R. Specifically, we modified the 6-item LOT-R by adding an opening statement of the scale to say "please inform us how you feel at this moment," and by changing the items to begin with "right now." The six original LOT-R items were not otherwise modified. Table 2 shows the original and modified versions of the LOT-R. For both scales, item score options were 0 (I disagree a lot) to 4 (I agree a lot), with reverse coding of the 3 pessimism items, for potential total scores of 0–24, with higher scores indicating higher optimism. This modified LOT-R was included along with the original LOT-R for all study assessments, and the order of the original and modified LOT-R was randomly selected at each administration to avoid bias. Cronbach's alphas for the original and modified LOT-R in this trial were .83 and .82 respectively.

Data analysis

Rates of identical item response to the modified and original LOT-R: To assess whether changes in timeframe led to different participant responses to the same items in the two scales, we compared specific item responses on the original and modified LOT-R scale (Supplementary Table 1) at each administration and calculated the proportion of identical responses to each item (e.g., providing the same response to item #1 at baseline on both the original and modified LOT-R).

Comparison of responsiveness (change over time) of the modified LOT-R scale to the original LOT-R and other scales: To estimate mean total scale scores and individual item scores for the modified and original LOT-R scales at each time point (baseline, 8 weeks, and 16 weeks), we utilized a longitudinal linear regression model for all measurements from both scales, with an unstructured covariance matrix and fixed effects for scale, time point, and a scale by time point interaction. This longitudinal model allows for inclusion of participants who had some missing data (e.g., those who completed assessments at some but not all time points), improving power to detect between-scale and between-item differences.

The change over time in the PANAS was assessed using a longitudinal linear regression model with a categorical effect of time and an unstructured covariance matrix.

To assess the magnitude of the mean change from baseline for each item/scale, we calculated the ES of the change from baseline at each time point by dividing the mean change at each time point by the standard deviation of the item/scale; this was performed for total scale scores and individual items. We then compared these changes in the total scale to the magnitude of changes seen with other psychological measures from the trial in the same population. To specifically compare change in the mean of the modified LOT-R to the original LOT-R, the time by scale (modified vs. original LOT-R) interaction terms were used; we repeated these assessments for individual items.

Examination of intraindividual variability of responses to items over time on the modified and original LOT-R: Finally, given that mean scores may not capture intraparticipant variability in responses to items, we also calculated change scores from baseline to 8 and 16 weeks for each participant with complete data, and examined the standard deviation of change for the full scale and individual items for the modified and original LOT-R to assess whether responses varied more in the modified version of the scale. Pitman's test for correlated variances was used to compare the standard deviation of the change on the two scales (Pitman, 1939). All analyses were performed using Stata 14.2 (College Station, TX); all statistical tests were two-tailed, and a p value of less than .05 was considered significant in this exploratory study.

Results

Of the 128 post-ACS participants in the trial, 125 (98%) completed both the original and modified LOT-R at one or more time points (see Table 1 for baseline characteristics). Mean modified LOT-R total score at baseline was significantly higher than the mean original LOT-R scores (baseline mean total score: modified LOT-R 19.1 [SD: 5.0] vs. original LOT-R 16.9 [SD: 5.8]; z= 5.07; p<0.001; Figure 1). Correlations (*r*) between the two scales (total scale scores) were 0.58 at baseline, 0.81 at 8 weeks, and 0.86 at 16 weeks.

Regarding item responses (Supplementary Table 1), at baseline (in-hospital) participants provided the same rating on the same item of the two LOT-R scales between 45% (item #2) and 62% (item #6) of the time, suggesting that participants often provided distinct responses to the items in the two scales. At 8 weeks (58%−78% agreement by item) and 16 weeks (63%−76%) post-hospitalization, rates of identical item scores were somewhat higher.

Mean modified LOT-R scores changed little over the 16-week period (Table 3), from a mean baseline score of 19.1 (SD 5.0) to 19.4 (SD 5.1) at 8 weeks and 18.9 (SD 5.8) at 16 weeks. These represented very small ES changes from baseline (ES= 0.07 [8 weeks] and ES= −0.03 [16 weeks]). Individual item scores (Table 3), likewise, showed nonsignificant and small magnitude changes. The mean scale score of the original LOT-R, in some contrast, had statistically significant increases (from 16.9 [SD 5.8] at baseline to 18.0 [SD 6.1] at 8 weeks to 18.5 [SD 6.0] at 16 weeks; p<0.05 for change from baseline at 8 and 16 weeks), though still with small magnitude ES changes (ES 0.18 at 8 weeks and ES 0.27 at 16 weeks).

Finally, changes in the state-based PANAS were substantially larger than either LOT-R scale over the course of 16 weeks, with change from a mean baseline score of 36.4 (SD 7.5) to 38.1 (SD 7.8) at 8 weeks and 40.1 (SD 6.7) at 16 weeks. This mean intraparticipant change of 3.74 points on the PANAS over 16 weeks was statistically significant ($p<.001$) and larger than that for the original LOT-R (1.54 points; $p=.002$) and the modified LOT-R (−0.16 points; $p=.74$). In terms of effect size, these changes over time in the original LOT-R and modified LOT-R were substantially smaller than those seen over 16 weeks on other psychological measures (Celano et al., 2018), including the PANAS and measures of negative psychological constructs (depression and anxiety; Supplementary Figure 1).

When comparing the magnitude of change from baseline in the mean scores of the modified and original versions of the LOT-R (Table 3), the modified LOT-R had smaller changes over time than the original scale at both 8 weeks and 16 weeks, with the difference statistically significant at 16 weeks (8 weeks: difference in change = 0.71 [95% confidence interval −0.17, 1.58]; $p=.11$; 16 weeks: difference in change =1.70 [95% confidence interval .81, 2.59]; $p<.001$).

Finally, when examining changes in individual item and total scale scores within participants, the intraperson variance of responses between baseline and 8 weeks, and baseline and 16 weeks, was greater for the overall scale and several individual items in the original LOT-R than the modified LOT-R (Supplementary Table 2). In particular, the variance of the change from baseline to 8 weeks in item 1, item 3 and the total of the original LOT-R was significantly greater than the variance of the change for the equivalent measures for the modified LOT-R (Pitman's test for equality of correlated variables; $p=.002$-$.044$). For the change from baseline to week 16, a statistically significant difference in the variance of the change within individuals was observed for item 1 only (Pitman's test; $p=.043$).

Discussion

In sum, among post-ACS patients receiving a PP-based intervention, a modified version of the LOT-R that focused on present-moment (state) optimism was not associated with greater change in mean scale scores or more intraindividual variability across 16 weeks compared to the original LOT-R. This modified LOT-R also showed smaller changes over time than those seen with more state-based measures of positive affect, depression, and anxiety, including specific analysis of the PANAS that found participants to have significant change in this positive psychological construct, implying that it was not simply that participants were having a consistent and unchanging psychological experience over the 16 weeks. This suggests that such modification of the LOT-R, at least in this cardiac population, is not sufficient to detect changes in state-based optimism that could be associated with an intervention designed to promote optimism and other positive psychological constructs.

There are several potential explanations for this finding. First, the original LOT-R was designed and validated to assess dispositional optimism (Scheier et al., 1994), and, aside from the introductory clause 'right now' none of the items were changed in the modified LOT-R. Therefore it may well be the case that this modified version of the LOT-R continued to measure dispositional, trait-based optimism with only this small change in the items

regarding timeframe. Items such as *I expect more good things to happen to me than bad* or *I don't count on good things happening to me* still appear to be eliciting more longitudinal, dispositional attitudes, even with the timeframe modification in this altered scale.

Another potential explanation is that greater changes seen with the original, dispositional measure may have reflected durable, longitudinal changes in optimism that were cultivated by participation in the well-being-focused intervention, with more in-the-moment optimism reflecting transient momentary circumstances. Changes in traditional LOT-R scores, though smaller than with other related measures of optimism and expectancy, have been seen in prior studies of well-being interventions (Malouff & Schutte, 2017). In addition, the higher modified LOT-R scores at baseline could have been near a ceiling for the scale in this cohort, limiting potential movement in scores. However such ceiling effects have not been seen with this scale (Ji, Holmes, & Blackwell, 2017), and in prior administrations of the original LOT-R in post-ACS patients, we found that 42% had scores above the mean baseline modified LOT-R score of 19 seen in the current cohort (Huffman, Beale, et al., 2016), making this explanation less likely.

Additional methods of assessing more dynamic states of optimism may be more effective. This may include using measures of related constructs, such as attributional or explanatory style (Abramson, Seligman, & Teasdale, 1978; Peterson & De Avila, 1995; Peterson & Villanova, 1988) or hope (Herth, 1991; Lopez et al., 2003), though these constructs are likely not identical to state optimism (Tomakowsky, Lumley, Markowitz, & Frank, 2001) and may also be more dispositional constructs. Other, potentially more promising, approaches could include the development of a validated state-based optimism measure using theory, careful item development, and sequential and serial testing, to more specifically target this construct. Finally, ecological momentary assessment (EMA) methods may have an even greater ability to assess optimism and outcome expectancy in real time as part of daily life, with much lower risk of recall bias (Shiffman et al., 2008; Steptoe et al., 2011).

A final potential explanation for these findings is that optimism is simply a dispositional trait. Optimism has generally been considered to be a longitudinal characteristic (Carver & Scheier, 2014), and while more recently some have challenged this conceptualization, it may well be the case that the construct of optimism, no matter the method of measurement, is largely stable and at least somewhat fixed. This would have implications for intervention development, potentially prompting well-being interventions to target positive affect or other more clearly dynamic constructs.

This study and analysis were limited by examination of a single population at two academic medical center sites with a specific medical condition. All participants also received an intervention and therefore we were not able to examine changes in the two measures in patients receiving treatment as usual. Finally, and importantly, though this modified version of the LOT-R had been used previously, this specific scale has not been validated in this or other populations.

In sum, a modified version of the LOT-R did not display more variability than the original version of the LOT-R and, at least in cardiac populations, does not appear to effectively measure 'state' optimism. Future studies should examine alternative means of measuring such a construct to determine whether such methods are able to identify state optimism as a variable and dynamic construct or whether it appears that optimism is indeed a largely static trait.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Conflicts of Interest and Source of Funding

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References

Abramson LY, Seligman ME, & Teasdale JD (1978). Learned helplessness in humans: critique and reformulation. Journal of Abnormal Psychology, 87(1), 49–74. [PubMed: 649856]

Ball HA, McGuffin P, & Farmer AE (2008). Attributional style and depression. British Journal of Psychiatry, 192(4), 275–278. [PubMed: 18378987]

Bredal IS, & Ekeberg O (2016). The Stability of Dispositional Optimism in Relation to Receiving or Not Receiving a Cancer Diagnosis. Psychology, 7, 816–824.

Carver CS (1989). How should multifaceted personality constructs be tested? Issues illustrated by self-monitoring, attributional style, and hardiness. Journal of Personality and Social Psychology, 56(4), 577–585. [PubMed: 2651646]

Carver CS, & Scheier MF (2014). Dispositional optimism. Trends Cogn Sci, 18(6), 293–299. [PubMed: 24630971]

Carver CS, Scheier MF, & Segerstrom SC (2010). Optimism. Clinical Psychology Review, 30(7), 879–889. [PubMed: 20170998]

Celano CM, Albanese AM, Millstein RA, Mastromauro CA, Chung W, Campbell KA, … Huffman JC (2018). Optimizing a positive psychology intervention to promote health behaviors after an acute coronary syndrome: the positive emotions after acute coronary events III (PEACE-III) randomized factorial trial. Psychosomatic Medicine, 80(6), 526–534. [PubMed: 29624523]

DuBois CM, Lopez OV, Beale EE, Healy BC, Boehm JK, & Huffman JC (2015). Relationships between positive psychological constructs and health outcomes in patients with cardiovascular disease: A systematic review. International Journal of Cardiology, 195:, 265–280. [PubMed: 26048390]

Huffman JC, Albanese AM, Campbell KA, Celano CM, Millstein RA, Mastromauro CA, … Park ER (2017). The Positive Emotions after Acute Coronary Events behavioral health intervention: Design, rationale, and preliminary feasibility of a factorial design study. Clinical Trials (London, England), 14, 128–139.

Huffman JC, Beale EE, Celano CM, Beach SR, Belcher AM, Moore SV, … Januzzi JL (2016). Effects of Optimism and Gratitude on Physical Activity, Biomarkers, and Readmissions After an Acute Coronary Syndrome: The Gratitude Research in Acute Coronary Events Study. Circulation: Cardiovascular Quality and Outcomes, 9(1), 55–63. [PubMed: 26646818]

Huffman JC, Millstein RA, Mastromauro CA, Moore SV, Celano CM, Bedoya CA, … Januzzi JL (2016). A positive psychology intervention for patients with an acute coronary syndrome: treatment development and proof-of-concept trial. Journal of Happiness Studies, 17:, 1985–2006. [PubMed: 28082831]

Ji JL, Holmes EA, & Blackwell SE (2017). Seeing light at the end of the tunnel: Positive prospective mental imagery and optimism in depression. Psychiatry Research, 247, 155–162. [PubMed: 27907825]

Kluemper DH, Little LM, & Degroot T (2009). State or trait: effects of state optimism on job-related outcomes. Journal of Organizational Behavior, 30(2), 209–231.

Luthans F, & Youssef CM (2007). Emerging positive organizational behavior. J Management, 33, 321–349.

Malouff JM, & Schutte NS (2017). Can psychological interventions increase optimism? A meta-analysis. The Journal of Positive Psychology, 12(6), 594–604.

Peterson C, & De Avila ME (1995). Optimistic explanatory style and the perception of health problems. Journal of Clinical Psychology, 51(1), 128–132. [PubMed: 7782467]

Peterson C, & Villanova P (1988). An Expanded Attributional Style Questionnaire. Journal of Abnormal Psychology, 97(1), 87–89. [PubMed: 3351118]

Pitman EJG (1939). A Note on Normal Correlation. Biometrika, 31, 9–12.

Ronaldson A, Molloy GJ, Wikman A, Poole L, Kaski JC, & Steptoe A (2015). Optimism and recovery after acute coronary syndrome: a clinical cohort study. Psychosomatic Medicine, 77(3), 311–318. [PubMed: 25738438]

Scheier MF, Carver CS, & Bridges MW (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. Journal of Personality and Social Psychology, 67(6), 1063–1078. [PubMed: 7815302]

Scheier MF, Carver CS, & Bridges MW (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. Journal of Personality and Social Psychology, 67(6), 1063. [PubMed: 7815302]

Segerstrom SC (2007). Optimism and resources: Effects on each other and on health over 10 years. Journal of Research in Personality, 41(4), 772–786.

Seligman ME, Rashid T, & Parks AC (2006). Positive psychotherapy. American Psychologist, 61(8), 774–788. [PubMed: 17115810]

Shiffman S, Stone AA, & Hufford MR (2008). Ecological momentary assessment. Annual Review of Clinical Psychology, 4, 1–32.

Steptoe A, Leigh ES, & Kumari M (2011). Positive affect and distressed affect over the day in older people. Psychology and Aging, 26(4), 956–965. [PubMed: 21517182]

Sweeny K, Carroll PJ, & Shepperd JA (2006). Is optimism always best? Future outlooks and preparedness. Current Directions in Psychological Science, 15(6), 302–306.

Tindle HA, Chang YF, Kuller LH, Manson JE, Robinson JG, Rosal MC, … Matthews KA (2009). Optimism, cynical hostility, and incident coronary heart disease and mortality in the Women's Health Initiative. Circulation, 120(8), 656–662. [PubMed: 19667234]

Tomakowsky J, Lumley MA, Markowitz N, & Frank C (2001). Optimistic explanatory style and dispositional optimism in HIV-infected men. Journal of Psychosomatic Research, 51(4), 577–587. [PubMed: 11595246]

Watson D, Clark LA, Tellegen A (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. Journal of Personality and Social Psychology, 54(6), 1063–1070. [PubMed: 3397865]

Whitley BE Jr. (1991). A short form of the Expanded Attributional Style Questionnaire. Journal of Personality Assessment, 56(2), 365–369. [PubMed: 16370890]

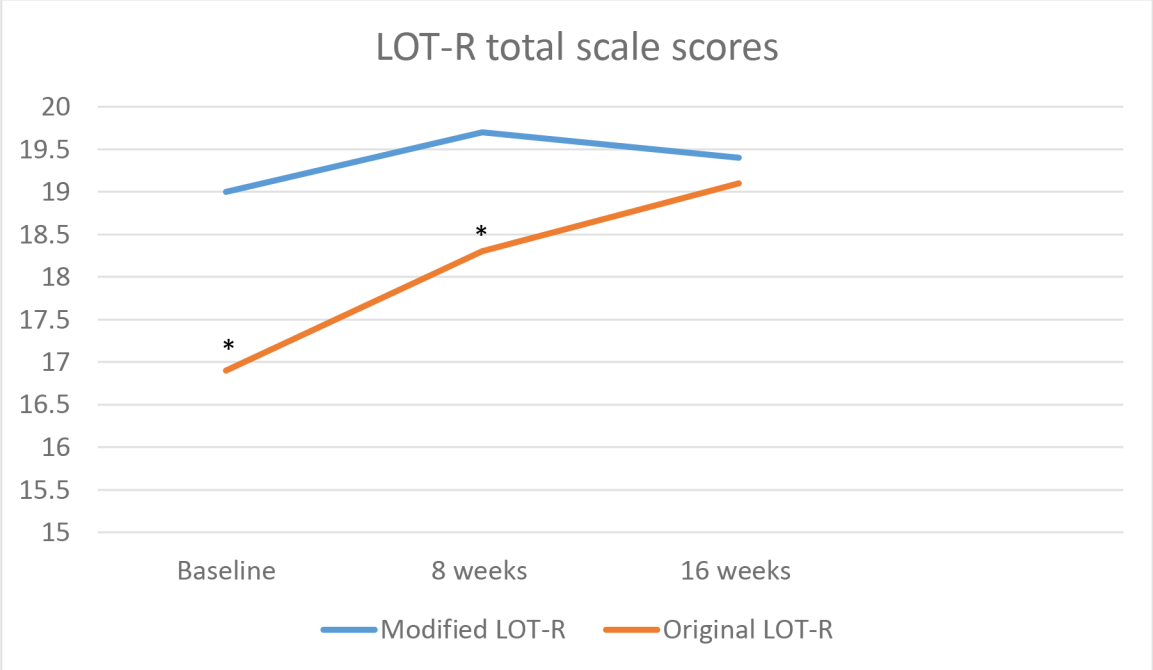

Figure 1.

Mean total LOT-R scale scores at each time point.

*p<.001 between scales

Baseline: Modified LOT-R 19.1 (SD 5.0) vs. original LOT-R 16.9 (SD 5.8); z= 5.07; p<0.001.

8 weeks: Modified LOT-R: 19.4 (SD 5.2) vs. original: LOT-R 18.0 (SD 6.1); z= 3.84; p<0.001.

16 weeks: Modified LOT-R 18.9 (SD 5.8) vs. original LOT-R 18.5 (SD 6.0); z=1.23 p=0.22.

Table 1.

Baseline characteristics of participants in this analysis (N=125)

Characteristic	Total
Sociodemographic characteristics	
Age; mean (SD)	62.9 (12.0)
Female sex	74 (59%)
White race	92 (75%)
Married	69 (55%)
Lives alone	35 (28.2%)
Medical characteristics	
Admission diagnosis of MI	73 (58.4%)
Length of hospitalization (days); mean (SD)	3.2 (2.7)
BMI	29.9 (6.3)
Type 2 diabetes	33 (26)
Current smoker	23 (18.4)
Hypertension	109 (87.2)
Hyperlipidemia	99 (79.84)
Prior ACS	41 (32.8)
Peak troponin T (ng/ml); mean (SD)	1.3 (2.8)
LVEF (%); mean (SD)	57.1 (11.8)
Antidepressant treatment at discharge	27 (21.6)
Anxiolytic treatment at discharge	19 (15.2)
Baseline self-report outcome measures (measure; range); all listed as mean (SD)	
Positive affect (PANAS;10–50)	36.2 (7.5)
Anxiety (HADS-A; 0–21)	7.0 (4.61)
Depression (HADS-D; 0–21)	4.84 (3.8)
Health behavior adherence (MOS; 3–18)	11.2 (2.52)

BMI=body mass index; HADS=Hospital Anxiety and Depression Scale; LOT-R=Life Orientation Test-Revised; LVEF=left Ventricular ejection fraction; MI= myocardial infarction; MOS=Medical Outcomes Study specific adherence scale; PANAS=Positive and Negative Affect Schedule. **All variables are presented as *n* (%) unless specified.**

Table 2.

Text of original and modified LOT-R scales. O indicates items that form the optimism subscale, P indicates items that form the pessimism subscale. Adapted from (Scheier, Carver & Bridges, 1994).

Original LOT-R						
Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no “correct” or “incorrect” answers. Answer according to your own feelings, rather than how you think “most people” would answer.						
	Type	I agree a lot	I agree a little	I neither agree nor disagree	I DISagree a little	I DISagree a lot
In uncertain times, I usually expect the best.	O	4	3	2	1	0
If something can go wrong for me, it will.	P	0	1	2	3	4
I’m always optimistic about my future.	O	4	3	2	1	0
I hardly ever expect things to go my way.	P	0	1	2	3	4
I rarely count on good things happening to me.	P	0	1	2	3	4
Overall, I expect more good things to happen to me than bad.	O	4	3	2	1	0
Modified LOT-R						
Please inform us how you feel at this moment.						
Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no “correct” or “incorrect” answers. Answer according to your own feelings, rather than how you think “most people” would answer.						
	Type	I agree a lot	I agree a little	I neither agree nor disagree	I DISagree a little	I DISagree a lot
Right now, I expect the best.	O	4	3	2	1	0
If something can go wrong for me right now, it will.	P	0	1	2	3	4
Right now, I’m optimistic about my future.	O	4	3	2	1	0
Right now, I don’t expect things to go my way.	P	0	1	2	3	4
Right now, I don’t count on good things happening to me.	P	0	1	2	3	4
Right now, I expect more good things to happen to me than bad.	O	4	3	2	1	0

Table 3.

Changes in modified and original LOT-R measures. All values reported were calculated using the analysis of response profiles model.

	Modified LOT-R ("in the past 2 weeks") State					Original LOT-R (Trait)					Comparisons	
	Mean baseline score (SD)	**Mean 8 week score (SD)**	**Estimated change from baseline**	**Mean 16 week score (SD)**	**Estimated change from baseline**	**Mean baseline score (SD)**	**Mean 8 week score (SD)**	**Estimated change from baseline**	**Mean 16 week score (SD)**	**Estimated change from baseline**	**Between-measure difference in change from baseline (8 weeks)**	**Between-measure difference in change from baseline (16 weeks)**
Item 1 (*In uncertain times, I usually expect the best*); range 1–5	3.34 (1.05)	3.39 (0.98)	0.06 (−0.15, 0.26) p=0.59 ES=0.053	3.40 (0.98)	0.06 (−0.15, 0.27) p=0.60 ES=0.054	2.90 (1.21)	3.12 (1.14)	0.22 (−0.02, 0.47) p=0.073 ES=0.19	3.18 (1.17)	0.28 (0.03, 0.53) p=0.030 ES=0.23	0.17 (−0.12, 0.46) p=0.25	0.22 (−0.04, 0.49) p=0.10
Item 2 * (*If something can go wrong for me, it will)*	2.50 (1.52)	2.86 (1.44)	0.36 (0.08, 0.64) p=0.011 ES=0.24	2.60 (1.53)	0.096 (−0.22, 0.41) p=0.55 ES=0.06	2.27 (1.51)	2.58 (1.55)	0.31 (0.02, 0.61) p=0.035 ES=0.21	2.76 (1.75)	0.49 (0.14, 0.84) p=0.006 ES=0.32	−0.05 (−0.31, 0.21) p=0.72	0.39 (0.04, 0.75) p=0.027
Item 3 *(I'm always optimistic about my future)*	3.42 (1.02)	3.12 (1.22)	−0.29 (−0.53, −0.06) p=0.014 ES= −0.29	3.25 (1.13)	−0.17 (−0.41, 0.07) p=0.16 ES= −0.17	2.82 (1.34)	3.03 (1.36)	0.21 (−0.09, 0.51) p=0.17 ES=0.16	3.06 (1.30)	0.24 (−0.02, 0.49) p=0.066 ES=0.18	0.51 (0.22, 0.79) **p<0.001**	0.41 (0.16, 0.66) **p=0.001**
Item 4 * *(I hardly ever expect things to go my way)*	3.06 (1.24)	3.14 (1.23)	0.08 (−0.16, 0.32) p=0.51 ES= 0.064	3.09 (1.25)	0.04 (−0.22, 0.29) p=0.79 ES= 0.028	2.91 (1.30)	3.00 (1.32)	0.09 (−0.15, 0.33) p=0.45 ES=0.070	3.10 (1.26)	0.18 (−0.08, 0.45) p=0.14 ES=0.14	0.01 (−0.26,0.28) p=0.93	0.15 (−0.16, 0.46) p=0.34
Item 5 * (*I rarely count on good things happening to me)*	3.32 (1.18)	3.38 (1.15)	0.061 (−0.20, 0.32) p=0.65 ES=0.052	3.23 (1.26)	−0.093 (−0.38, 0.19) p=0.52 ES= −0.079	2.78 (1.45)	2.92 (1.44)	0.14 (−0.12, 0.41) p=0.28 ES= 0.10	3.10 (1.28)	0.32 (0.05, 0.59) p=0.018 ES=0.22	0.08 (−0.27, 0.44) p=0.64	0.41 (0.08, 0.75) p=0.017
Item 6 (*Overall, I expect more good things to happen to me than bad)*	3.42 (0.93)	3.53 (0.94)	0.11 (−0.10, 0.32) p=0.32 ES= 0.12	3.44 (1.01)	0.02 (−0.17, 0.21) p=0.83 ES=0.022	3.27 (1.07)	3.40 (1.03)	0.13 (−0.06, 0.32) p=0.19 ES=0.12	3.42 (1.09)	.015 (−0.08, 0.37) p=0.21 ES=0.14	0.02 (−0.20, 0.24) p=0.88	0.13 (−0.09, 0.35) p=0.26
Total score (range 0–24)	19.1 (5.0)	19.4 (5.1)	0.35 (−0.48, 1.19) p=0.41 ES=0.071	18.9 (5.8)	−0.16 (−1.13, 0.80) p=0.74 ES= −0.032	16.9 (5.8)	18.0 (6.1)	1.06 (0.04, 2.08) p=0.04 ES=0.18	18.5 (6.0)	1.54 (0.57, 2.50) p=0.002 ES=0.27	0.71 (−0.17, 1.58) p=0.11	1.70 (0.81, 2.59) **p<0.001**
Optimism subscale (range 0–12)	10.2 (2.5)	10.0 (2.6)	−0.13 (−0.58, 0.31) p=0.55 ES= −0.054	10.1(2.8)	−0.13 (−0.61, 0.36) p=0.61 ES= −0.051	9.0 (3.0)	9.5 (3.1)	0.54 (−0.03, 1.12) p=0.066 ES= 0.18	9.6 (3.1)	0.64 (0.11, 1.16) p=0.018 ES=0.22	0.68 (0.11, 1.25) **p=0.020**	0.76 (0.32, 1.21) **p=0.001**
Pessimism subscale (range 0–12)	8.9 (3.2)	9.4 (3.2)	0.49 (−0.05, 1.04) p=0.078 ES=0.15	8.9 (3.6)	−0.005 (−0.67, 0.66) p=0.99 ES=−0.001	8.0 (3.6)	8.5 (3.8)	0.52 (−0.09, 1.12) p=0.096 ES= 0.14	8.9 (3.8)	0.92 (0.27, 1.56) **p=0.006 ES=0.25**	0.02 (−0.50, 0.55) p=0.93	0.92 (0.25, 0.159) **p=0.007**

* Pessimism subscale item; reverse scored