Personality change and personality as predictor of change in psychotherapy:

A longitudinal study in a community mental health clinic

Phuong Linh L. Nguyen¹, Han Lim Kim², Anne-Marie N. Romain², Saniya Tabani², William F.
Chaplin²

¹University of Minnesota

²St. John's University

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Correspondence concerning this article should be addressed to Phuong Linh L. Nguyen, Department of Psychology, University of Minnesota, 75 E River Rd, Minneapolis, MN, 55455. Email: nguy4006@umn.edu

The dataset, data dictionary, SPSS syntax, and outputs can be retrieved at osf.io/dy7rt.

Abstract

Research suggests that personality may change due to important life events, such as psychotherapy, and that personality and attitudes may predict treatment progress. Longitudinal data in a community mental health clinic showed positive changes in Emotional Stability, Hope, Gratitude, and Motivation during the course of psychotherapy. The static approach relating baseline personality and attitudes to treatment progress did not yield fruitful results. The dynamic approach was more effective, in which we treated personality and attitudes as malleable and used changes in these variables as predictors of progress. Treatment progress correlated with an increase in Emotional Stability. Positive changes in general life attitudes (Hope, Gratitude, Quality of Life) more so than therapy-specific attitudes (Motivation, Working Alliance) predicted symptom reduction.

Keywords: psychotherapy, treatment progress, personality, attitude, change and stability.

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Conceptualizations of personality traits emphasize its continuity and stability (Costa & McCrae, 1994). Stability was argued to exist for everyone and in all the Big Five traits: Agreeableness, Conscientiousness, Extraversion, Neuroticism (reversed Emotional Stability), and Openness to experience. However, substantial evidence has emerged to demonstrate that personality traits do change, particularly as a result of important and relevant life events (Bleidorn, Hopwood, & Lucas, 2018).

Psychotherapy is arguably a major event in an individual's lifespan. We would reasonably expect changes on an individual level as a result of starting and continuing with psychotherapy. A meta-analysis of 207 studies showed that psychological interventions changed personality "between one-fifth to one-third of a standard deviation" (Roberts et al., 2017). The largest effects were in traits Neuroticism and Extraversion.

The literature on personality traits as predictors of psychotherapy treatment outcomes may be grouped into two approaches: the static approach and the dynamic approach. The *static approach* adopts a static definition of personality and examines personality at baseline as predictors of progress. Extraversion (Zuckerman et al., 1981), Neuroticism, and Openness (Quilty et al., 2008) have been predictive of responsiveness to treatment, treatment outcomes, and social adjustment post-treatment. A meta-analysis across 99 studies showed that baseline personality predicted treatment progress in the theoretically congruent directions: a negative association with Neuroticism and positive associations with the other four traits (Bucher, Suzuki, & Samuel, 2019). The *dynamic approach* relates changes in personality to changes in symptomatic distress. In particular, changes in Neuroticism were strongly related to changes in

depressive symptoms (Chow & Roberts, 2014). Dynamic research is much more lacking in the literature compared to the dominant static approach.

Current Study

The current research incorporated both the static and dynamic approaches and treat personality as stable yet dynamic variables in our prediction models, in which we addressed variability in symptomatic distress as a function of personality and attitude variables. We tested three hypotheses: 1) Personality and attitudes would change positively during psychotherapy; 2) Personality and attitudes at baseline (static approach) would predict treatment progress; and 3) Changes in personality and attitudes (dynamic approach) would predict symptom reduction during the course of psychotherapy.

We predicted the most amount of change in Extraversion, Emotional Stability, and Working Alliance during psychotherapy, and the strongest dynamic effects in Agreeableness, Extraversion, Emotional Stability, and Working Alliance: Extraversion, Agreeableness, and Working Alliance directly relate to the interpersonal therapist-client relationship; Emotional Stability directly relate to the target of psychotherapy.

Method

Participants

Longitudinal data were collected on 91 adult therapy clients ($N_{\text{observations}} = 2,860$). The mean age at the start of therapy was 33.72 years old ($SD = 12.41$). Of the 91 clients, 51 were female. 45 clients identified as Caucasian, 15 as Hispanic or Latino, and 7 for each category of Black/African American, Asian, mixed, or “other.” At baseline, 75% endorsed anxiety, 55% endorsed depression, and 20% endorsed having social problems. 59% reported that difficulties began over a year prior to treatment. The median length of therapy was 48 weeks ($M = 65.29$, SD

= 60.92), with a wide range from 3 to 320 weeks. There was a variety of diagnoses, including Major Depressive Disorder, Generalized Anxiety Disorder, Posttraumatic Stress Disorder, and Borderline Personality Disorder.

Procedures

The research team is located at a university-based community mental health training clinic. 97% of the clinic's services were provided to members of the community and 3% to students typically served by the university counseling center. Data were collected as a part of their treatment at the clinic. The research program was approved by the Institutional Review Board to use dual-consent forms for treatment and for research purposes. The treatment fee was determined on a sliding scale based on income. All clients at the center first completed a preliminary screening phone interview with a doctoral fellow, when basic demographic information and symptoms were collected. Clients who endorsed active suicide ideation, acute psychosis, severe eating disorders, or substance abuse, were referred to appropriate facilities.

All therapy was provided by doctoral-level clinical students, who were supervised by licensed psychologists conducting evidence-based interventions. Student therapists had a caseload ranging from one to three clients at any given time. When a student transitioned to internship, their cases were transferred to a different student. Thus, in this longitudinal data of 91 clients, there were as many, if not more, therapists and some of the clients had more than one therapist during their course of treatment. Although we recognize therapist effects in psychotherapy and the analytic approaches to address them (Walwyn & Roberts, 2010), such analyses were not appropriate for our dataset.

Measures

The primary outcome measure was the Outcome Questionnaire – 45 items (OQ-45; Lambert et al., 1996) – a self-report scale designed to monitor progress in psychotherapy. The items capture common symptoms in psychiatric disorders (e.g., “I feel no interest in things”). It was administered to adult clients at baseline and bi-weekly intervals to track progress.

Personality traits were measured by the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003). Attitude scales included Hope (Snyder et al., 1996), Gratitude (McCullough, Emmons, & Tsang, 2002), Quality of Life (The Whoqol Group, 1998), Therapeutic Motivation (Pelletier, Tuson, & Haddad, 1997), and Therapeutic Working Alliance (Duncan et al., 2003).

Data Preparation, Analysis, and Statistical Power

When these measures were introduced to the clinic, they were given to all clients, including those who had been participating in psychotherapy for a long time. Because much of the critical change in psychotherapy occurs early in the process (Owen et al., 2015), we only included participants whose first measures were completed within ten weeks of their first appointment. We used Hierarchical Linear Modeling to account for individual and aggregated patterns in the data. Due to the numerous measured variables and associated tests, alpha is set at .01 to determine statistical significance. The dataset, dictionary, SPSS syntax and outputs are accessible at the OSF repository¹. This research was not preregistered.

Given that the data used for these analyses come from an existing dataset, we conducted a sensitivity analysis to determine our statistical power given the sample size, a small (.10), moderate (.30), and large (.50) population effect size expressed as a correlation, and our conservative two-tailed Type I error rate of .01. The effective sample size was conservatively

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based on the number of clients (91), not the total number of observations (2860) used in the analyses. Given these parameters, we had an achieved power of .05 for a small effect, .63 for a moderate effect, and .99 for a large effect.

These power estimates suggested that the minimal detectable effects would be at least moderate in size. Because both the static and dynamic hypotheses concerned moderator effects that are generally small due to their conditional nature, non-significant findings should not be taken as indicating the absence of any effect, but as the absence of a large effect. On the other hand, the more direct tests of change in personality and attitudes (hypothesis 1) are more likely to have effects in the moderate range and thus the associated analyses had somewhat greater power. We do not anticipate any of the effects implied by our hypotheses to be large.

Results

Personality and Attitude Change

Personality and attitude scores were regressed on time, which was measured as the number of weeks since the first psychotherapy appointment (Table 1). Three of the five attitude measures showed positive changes: Hope ($\beta = .46 \pm .27^2$, $t_{(52.08)} = 4.54$, $p < .001$), Gratitude ($\beta = .20 \pm .17$, $t_{(37.80)} = 3.44$, $p = .001$), and Motivation ($\beta = .26 \pm .18$, $t_{(43.67)} = 3.98$, $p < .001$). Emotional Stability (reversed Neuroticism) was the only personality trait to show positive change ($\beta = .25 \pm .19$, $t_{(18.66)} = 3.73$, $p = .001$).

² This denotes the 99% confidence interval of the parameter estimate.

	Max Decrease	Max Increase	Average Change (β)
Hope	-0.71	2.03	0.46 [.19, .73] **
Gratitude	-0.36	1.02	0.20 [.04, .37] **
Motivation	-0.17	1.09	0.26 [.08, .43] **
Quality of Life	-0.59	0.99	0.16 [-.03, .36] *
Working Alliance	-1.23	2.05	0.17 [-.11, .45]
Agreeableness	-0.40	0.52	0.09 [-.06, .25]
Conscientiousness	-1.10	1.39	0.07 [-.17, .30]
Emotional Stability	-0.46	0.64	0.25 [.06, .44] **
Extraversion	-0.58	0.99	0.18 [-.02, .38] *
Openness	-0.59	0.73	0.12 [-.07, .32]

Table 1. Change in standardized attitude and personality scores for each increase of a standard deviation in weeks since the first appointment – maximum decrease, maximum increase, and average change (Beta) with 99% confidence intervals. * $p < 0.05$, ** $p < 0.01$.

Static Approach and Dynamic Approach

At baseline, symptomatic distress negatively correlated with Hope ($r = -.53, p < .001$), Gratitude ($r = -.53, p < .001$), Quality of Life ($r = -.64, p < .001$), Extraversion ($r = -.32, p = .002$), Conscientiousness ($r = -.39, p < .001$), and Emotional Stability ($r = -.46, p < .001$).

Total OQ scores were regressed on time as measured by weeks since the first appointment, with centered baseline personality and attitude scores as moderators. Overall, clients showed symptom reduction over the course of psychotherapy ($\beta = -.47 \pm .30, t_{(38.56)} = -4.30, p < .001$). Our results did not show any interaction effect using the static approach; that is, personality and attitudes at baseline were not related to rates of improvement.

In the dynamic approach of personality change as a predictor of treatment outcomes, individual slopes and intercepts for each personality and attitude scores were computed from mixed effects analyses of personality/attitude change. OQ scores were regressed on time as measured by weeks since the first appointment, with personality and attitude slopes as

moderators (Table 2). There was a negative time x slope interaction for Hope ($\beta = -.70 \pm .38$, $t_{(31.71)} = -5.12$, $p < .001$), Gratitude ($\beta = -1.17 \pm .91$, $t_{(28.82)} = -3.57$, $p = .001$), Quality of Life ($\beta = -1.03 \pm .60$, $t_{(28.96)} = -4.77$, $p < .001$), and Emotional Stability ($\beta = -1.23 \pm 1.21$, $t_{(32.45)} = -2.79$, $p = .009$). An increase in these variables over time was associated with a decrease in distress.

	Standardized Beta (β)	99% C.I.	P-Value
Hope	-0.70	[-1.08, -0.33]	<.001**
Gratitude	-1.17	[-2.08, -0.26]	.001**
Motivation	-0.36	[-1.57, 0.85]	.420
Quality of Life	-1.03	[-1.62, -0.43]	<.001**
Working Alliance	-0.22	[-0.77, 0.33]	.284
Agreeableness	-0.49	[-2.61, 1.64]	.561
Conscientiousness	-0.47	[-1.08, 0.15]	.046*
Emotional Stability	-1.23	[-2.44, -0.02]	.009**
Extraversion	-0.70	[-1.57, 0.18]	.037*
Openness	-0.22	[-1.36, 0.91]	.596

Table 2. Personality and attitude change as predictor of treatment progress. A negative Beta estimate indicates that an increase in this variable was related to a decrease in symptomatic distress. * $p < 0.05$, ** $p < 0.01$.

Discussions

Personality and Attitude Change

Our results provided some evidence for personality trait change during psychotherapy. As predicted, Emotional Stability showed the most amount of change, followed by Extraversion, and was the only personality variable to reach statistical significance. Notably, however, Emotional Stability and Extraversion are both strongly related to many diagnostic groups for internalizing or affective disorders, particularly with a pattern of high Neuroticism – low Emotional Stability (Clark, 2005). In other words, our sample showed no evidence of personality

change during psychotherapy beyond those traits with strong established links with the disorders targeted by treatment. Nonetheless, we expect that change in personality is a longer-term process than symptomatic change. Furthermore, we adopted a wide baseline period spanning ten weeks and did not have access to personality and attitude data prior to symptom development. Thus, our failure to find change should not be viewed as definitive.

We found more consistent support for attitude change, with Hope, Gratitude, and Motivation showing positive change. These results are consistent with the notion that personality traits are relatively stable across situation and time, even in the presence of a significant life event such as psychotherapy. In contrast, attitudes may be more variable and flexible to situational and longitudinal change. However, changes in Quality of Life and Working Alliance with the therapist did not reach statistical significance ($ps = .03$ and $.105$). We thus failed to affirm the intuitive notion that clients would indicate higher cooperation with further psychotherapy sessions.

Personality/Attitude and Level of Distress at Baseline

There were strong associations between personality/attitudes and distress at baseline. Clients who were higher in positive attitudes – particularly Hope, Gratitude, and Quality of Life – reported less distress at the start of treatment compared to those with more negative outlooks ($ps < .001$). For personality traits, clients high in Conscientiousness, Emotional Stability, and Extraversion were relatively lower on distress at baseline ($ps \leq .002$). These effects ought not to be directly interpreted as an inverse relationship between traits and psychological distress. It is important to consider the possible factors that may contribute to a decision to seek out psychotherapy – an active support network, for instance – that may be facilitated by being an extraverted and agreeable individual who is open to new experiences. Conscientious individuals

may also address their psychological distress before it reaches the same level as their less conscientious peers.

Static Approach: Personality and Attitude at Baseline

The nature of psychotherapy, particularly of Cognitive-Behavioral Therapy, primarily targets maladaptive thought patterns (Beck, 2011). It is then reasonable to expect that clients who started with positive attitudes would have less room for improvement and not benefit as quickly from psychotherapy compared to those with more negative outlooks and maladaptive traits at the beginning. However, we did not find any interaction effect between improvement rates and baseline personality/attitude before psychotherapy began. Thus, the results did not provide support for a ceiling effect in clients who started with adaptive attitudes and personality profiles.

Dynamic Approach: Personality and Attitude Slopes

As we predicted, positive changes in attitudes, specifically for Hope, Gratitude, and Quality of Life, were associated with faster treatment progress during psychotherapy ($ps \leq .001$). Contrary to the static model, this result reinforces the relationship between positive thought patterns and the process of Cognitive-Behavioral Therapy. We did not find this effect for Working Alliance and Motivation ($ps = .284$ and $.420$), which were counter-intuitive because of the inherent connection between these attitudes and psychotherapy, whereas Hope, Gratitude, and Quality of Life were more general life attitudes.

Emotional Stability was the only personality trait whose change was related to treatment progress – an increase in Emotional Stability was associated with a faster rate of improvement ($p = .009$). This suggests, as per the TIPI items, that reportedly becoming calmer and more emotionally stable led to a more rapid decrease of symptomatic distress during psychotherapy. Conscientiousness and Extraversion also showed the same directional effect but failed to reach

significance (p s = .046 and .037). The lack of an effect for Agreeableness (p = .561) contradicted our hypotheses, which predicted that its interpersonal aspect, similar to that of Extraversion, would be especially beneficial to psychotherapy. Notably, however, the natures of these facets are inherently different. Whereas Extraversion's talkativeness and enthusiasm suggest an outward self-expression, Agreeableness's sympathy and harmony are more related to compliance. In the psychotherapy context, a tendency to speak one's mind is very different, and perhaps much more beneficial, than an inclination to avoid conflicts and disagreements.

Strengths and Limitations

Our research program is based in a community clinic and thus benefited greatly from the diverse sample of clients for whom psychotherapy might not have otherwise been accessible. The longitudinal approach of biweekly data collection allowed us to sensitively capture the trajectory of symptomatic change. In addition, the inclusion criteria – which included only clients whose first measures were collected within their first ten weeks – increased the chances that we captured the critical period of change at the beginning of psychotherapy. Unlike the majority of existing literature, we did not focus on a single disorder, but rather the effect of psychotherapy as a whole.

On the other hand, our sample size (91 participants) was greatly reduced as a result of implementing our inclusion criteria in a real-life, uncontrolled clinical setting, in which different measures were introduced at various time-points during psychotherapy. Clients may also stop participating without notice or attend sessions sparingly. This resulted in a dataset without uniformed waves of data-collection and a potential loss of valuable data due to attrition. Conducting research in an operating clinic also dictated that we did not intrude upon the therapeutic process. This resulted in short measures, such as the TIPI. Although the TIPI has

demonstrated strong predictive validity in various settings (Burns et al., 2017), the two items per variable resulted in higher measurement error and variables that were less sensitive to change, which might explain our failure to detect some hypothesized effects. However, we sacrificed some measurement reliability to gather our data in an externally valid, naturalistic, clinical setting. Whereas this may affect our ability to detect effects, it also allowed us to examine this change in a real-life intensive longitudinal dataset.

Furthermore, we did not hypothesize a mechanism of change. Additional mediation analyses, in which we explored changes in attitudes as potential mediators for effects of personality change on treatment outcomes, are reported in appendix A. Because self-report measures were used for all analyses, a change in trait scores may reflect an effect of self-image, which, although still suggestive of positive development in the psychotherapy context, may not reflect substantive personality change. It is our intention that these exploratory findings may serve as the basis for more theoretically grounded confirmatory work in the future.

Conclusions

Clients demonstrated a decline in symptomatic distress and positive change in Emotional Stability, Hope, Motivation, and Gratitude across the duration of psychotherapy. We tested personality and attitude variables as predictors of treatment progress using two approaches: The static approach did not yield fruitful results, showing no association between baseline personality/attitude and treatment progress. Our results supported the dynamic approach which treated personality and attitude variables as malleable, showing a positive effect of changes in general life attitudes – Hope, Gratitude, and Quality of Life – more so than therapy-specific attitudes – Working Alliance and Motivation – on treatment progress. Positive changes in

Emotional Stability, followed by Conscientiousness and Extraversion, were associated with symptom reduction.

This research program aimed to contribute to the literature on personality change and the impacts of these factors on symptomatic change in psychotherapy. Beyond personality at the trait level, we included attitude variables which were more sensitive to change and better predictors of symptomatic change. The contribution is enhanced by intensive waves of longitudinal data collected at a community mental health clinic. Although such data have limitations, these are offset by the frequent data collection, naturalistic setting, and diversity of the client population.

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Appendix A: Mediation Analyses

Mediation models were tested to explore changes in attitudes as potential mediators for effects of personality change on treatment outcomes. Bootstrapping procedures with 5,000 bootstrapped samples tested the significance of these indirect effects using the PROCESS modeling tool version 3.4 for the IBM SPSS Statistics software (Hayes, 2017). We found evidence that changes in attitude (Hope, Gratitude, and Quality of Life), mediated the relation between changes in Emotional Stability and treatment progress. These variables were strongest individual predictors of treatment progress. Although these analyses are premature given the current sample size, we believe that this is a potential future direction to the studies of personality-attitude and treatment progress.

The regression coefficient between Emotional Stability slope and Hope slope was statistically significant ($p < .001$), as was the regression coefficient between Hope slope and treatment progress with Emotional Stability slope in the model ($p < .001$). The bootstrapped unstandardized indirect effect was -22.53, with the 95% confidence interval ranging from -20.62 to -4.52. Because the null was not included in the confidence interval, this indirect effect was statistically significant.

The regression coefficient between Emotional Stability slope and Gratitude slope was statistically significant ($p = .002$), as was the regression coefficient between Gratitude slope and treatment progress with Emotional Stability slope in the model ($p < .001$). The bootstrapped unstandardized indirect effect was -6.78, with the 95% confidence interval ranging from -14.71 to -1.90. Because the null was not included in the confidence interval, this indirect effect was statistically significant.

The regression coefficient between Emotional Stability slope and Quality of Life slope was statistically significant ($p < .001$), as was the regression coefficient between Quality of Life slope and treatment progress with Emotional Stability slope in the model ($p < .001$). The bootstrapped unstandardized indirect effect was -11.25, with the 95% confidence interval ranging from -20.20 to -4.62. Because the null was not included in the confidence interval, this indirect effect was statistically significant.

Appendix B: Bivariate correlations between baseline variables and slopes

Baseline Variables	1	2	3	4	5	6	7	8	9	10
1. OQ										
2. Extraversion	-.32** [-.49, -.12]									
3. Agreeableness	-.16 [-.36, .04]	.07 [-.14, .27]								
4. Conscientiousness	-.39** [-.55, -.20]	.17 [-.04, .37]	.16 [-.05, .35]							
5. Emotional Stability	-.46** [-.61, -.28]	.02 [-.19, .23]	.13 [-.07, .33]	.18 [-.03, .37]						
6. Openness	-.17 [-.36, .04]	.31** [.11, .49]	.13 [-.08, .32]	.09 [-.12, .29]	-.02 [-.22, .19]					
7. Hope	-.53** [-.66, -.36]	.43** [.24, .58]	.20 [-.01, .39]	.52** [.35, .66]	.28** [.07, .46]	.20 [-.01, .39]				
8. Gratitude	-.53** [-.66, -.36]	.27** [.07, .45]	.29** [.08, .47]	.22* [.02, .41]	.15 [-.06, .35]	.13 [-.08, .33]	.43** [.24, .58]			
9. Quality of Life	-.64** [-.75, -.50]	.24* [.04, .43]	.40** [.21, .56]	.54** [.37, .67]	.29** [.09, .47]	.18 [-.03, .37]	.64** [.50, .75]	.62** [.47, .73]		
10. Working Alliance	-.09 [-.48, .34]	.45* [.04, .73]	.41 [-.00, .70]	.05 [-.37, .46]	.11 [-.32, .50]	.22 [-.21, .58]	.16 [-.27, .53]	.35 [-.07, .67]	.27 [-.16, .61]	
11. Motivation	-.24* [-.43, -.03]	.21* [.00, .41]	.07 [-.14, .28]	.07 [-.15, .27]	.08 [-.13, .29]	.07 [-.15, .27]	.12 [-.10, .32]	.34** [.14, .52]	.14 [-.07, .34]	.53* [.13, .78]

Correlation among baseline variables with 95% confidence intervals. * $p < 0.05$, ** $p < 0.01$.

Slopes	1	2	3	4	5	6	7	8	9	10
1. OQ										
2. Extraversion	-.23* [-.42, -.03]									
3. Agreeableness	-.07 [-.28, .14]	.29** [.09, .47]								
4. Conscientiousness	-.22* [-.41, -.01]	.34** [.14, .51]	.21 [-.00, .40]							
5. Emotional Stability	-.31** [-.49, -.10]	.24* [.03, .43]	.17 [-.04, .37]	.28** [.07, .46]						
6. Openness	-.07 [-.27, .15]	.49** [.31, .63]	.50** [.33, .65]	.12 [-.09, .33]	.05 [-.16, .26]					
7. Hope	-.51** [-.65, -.34]	.41** [.22, .57]	.18 [-.04, .37]	.46** [.28, .61]	.38** [.19, .55]	.19 [-.03, .38]				
8. Gratitude	-.39** [-.56, -.20]	.25* [.04, .44]	.20 [-.01, .40]	.22* [.01, .41]	.32** [.12, .50]	.17 [-.04, .37]	.60** [.45, .72]			
9. Quality of Life	-.47** [-.62, -.29]	.30** [.09, .48]	.13 [-.09, .33]	.52** [.35, .66]	.41** [.22, .57]	.17 [-.05, .36]	.65** [.50, .75]	.43** [.24, .58]		
10. Working Alliance	-.12 [-.32, .09]	.13 [-.08, .33]	.29** [.08, .47]	.38** [.19, .55]	.17 [-.04, .37]	.02 [-.19, .23]	.32** [.11, .50]	.39** [.20, .56]	.26* [.06, .45]	
11. Motivation	-.10 [-.30, .11]	.14 [-.07, .34]	.40** [.21, .57]	.15 [-.06, .35]	-.01 [-.22, .20]	.13 [-.08, .33]	.19 [-.02, .39]	.09 [-.13, .29]	.13 [-.08, .33]	.19 [-.03, .38]

Correlation among slopes with 95% confidence intervals. * $p < 0.05$, ** $p < 0.01$.