3-2011

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Patrick Pössel
University of Louisville

S. Denise Thomas
University of Louisville

Cognitive Triad as mediator in the Hopelessness model? A three-wave longitudinal study

Patrick Pössel

Department of Clinical and Developmental Psychology, Eberhard-Karls-University, Tübingen,

Germany

S. Denise Thomas

Department of Educational and Counseling Psychology, University of Louisville, Louisville,

KY, USA

Abstract

Several authors proposed that all elements of Beck's cognitive triad (1976) mediate the associations between inference style as described in the hopelessness model (Abramson, Alloy, & Metalsky, 1989) and depressive symptoms. Results of a 3-wave longitudinal study indicate only a partial mediation model with all elements of the cognitive triad being associated with all inference styles, with depressive symptoms fitting the data best. Controlling for direct and indirect effects, no individual element of the cognitive triad mediates the association between inference styles and depressive symptoms. The partial mediation model is not stable across sex or clinical vs subclinical samples. In general, the data supports the integration of all three elements of the cognitive triad into the hopelessness model.

Keywords: depression; cognitive theory; hopelessness model; cognitive triad.

Over the past several decades, two major cognitive theories which explain the development and maintenance of depression have been developed and empirically tested, and have gained widespread popularity: The hopelessness model (Abramson, Alloy, & Metalsky, 1989) and Beck's cognitive theory (Beck, 1976). These models gained importance for different reasons: First, they provide a theoretical basis for mechanisms underlying the development and maintenance of depression. Second, both cognitive models are supported by empirical research (see for a review Abramson, Alloy, Hankin, Haeffel, MacCoon, & Gibb, 2002). Finally, some of the most effective interventions for depression have been developed based on these models (Abramson et al., 1989; Beck, 1976).

The *hopelessness model* (Abramson et al., 1989) features inference style as the distal and hopelessness as the proximal causes of depression. In this model, hopelessness is defined as expecting a negative outcome for future events. Inference style is described as the tendency to make negative inferences about (1) the stability and (2) globality of causes, (3) consequences, and (4) characteristics of the self (self worth, personal abilities, personality, desirability, ect.) following a negative event. When an individual repeatedly infers a negative event in this way he or she develops the expectation of hopelessness, which is interpreted as being a proximal cause for the symptoms of depression. In other words, hopelessness mediates the effects of the tendency to make negative inferences on depression. In addition, (5) attributing a negative event as being caused internally is thought to lead to low self-esteem. The internal attribution is unique from the previously mentioned inferences in two regards. First, having internal attribution for negative events is not a cause of depression but of low self-esteem alone. Second, its effect on self-esteem is not mediated by hopelessness.

In *Beck's cognitive model* (1976), schemata, cognitive errors, cognitive triad, and automatic thoughts are central to the development and maintenance of depression. Schemata are relatively enduring, organizing structures that guide situational information processing. Depressogenic schemata are negative in content and consist of immature, absolute, and rigid attitudes about the self and its relation to the world. When activated by stress, depressogenic schemata lead to cognitive errors, the next step in the causal pathway to depression. Cognitive errors cause our perception and thinking to be unrealistic, extreme, and distorted in a negative way. As a result, a depressed individual tends to (a) make long-range projections, anticipating that current difficulties or suffering will continue indefinitely (negative view of the future); (b) attribute negative events to personal psychological, moral, or physical defect (negative view of the self); and (c) see the world as making exorbitant demands and/or presenting insuperable obstacles to reaching life goals (negative view of the world). Collectively these three cognitive views are known as the cognitive triad (Beck, Rush, Shaw, & Emery, 1979). Following Beck (1976), the cognitive triad finds its expression in negative automatic thoughts. Automatic thoughts are understood as temporary, non-emotional mental events, which are subjectively plausible in certain situations (Beck, 1976). These automatic thoughts can be interpreted as the most proximal cause for the emotional, somatic, and motivational symptoms of depression. In an update to his traditional theory, Beck (1996) introduced the concept of *modes*. Modes represent a network of cognitive, affective, motivational, and behavioral components that are designed to deal with specific demands or problems. Based on this update, all variables in Beck's cognitive theory are directly associated with each other, suggesting only partial mediation of depressive symptoms. Empirical studies have confirmed this prediction (Kwon & Oei, 1992; Pössel, 2010a).

Both cognitive models show similarities. The most obvious similarity between these

models is their classification as cognitive vulnerability-stress models, in the sense that the

interactions between cognitive vulnerabilities and activating negative events are used to explain

why some individuals develop depression while others do not show this psychopathology.

Beyond this somewhat crude classification, there are further obvious theoretical similarities

between the cognitive constructs of these theories. While inference style and schemata are

distinguishable constructs (Hankin, Lakdawalla, Latchis Carter, Abela, & Adams, 2007; Pössel

& Knopf, 2010) and consistently demonstrate different associations with depressive symptoms

(Haeffel et al., 2003), Abramson et al.'s concept of hopelessness (1989) and Beck's negative

view of the future as elements of the cognitive triad (1976) are essentially the same (Spangler,

Simons, Monroe, & Thase, 1997). This notion is shared by the authors of the hopelessness

model. Abramson, Alloy, and Metalsky (1988) hypothesize that the proximal causes (i.e.,

hopelessness and negative cognitive triad) and the symptom profiles described by the two

models largely overlap. Specifically, the hypothesis that hopelessness overlaps with the negative

cognitive triad is partially supported by a longitudinal study with college students (Metalsky &

Joiner, 1992). In that study, hopelessness only partially mediates the association of inference

styles about causes (combined stability and globality), consequences, and characteristics of the

self with symptoms of hoplessness depression. Therefore, the authors suggest that it is not

hopelessness, but rather all three elements of Beck's cognitive triad that mediate these

associations.

Specific hypotheses concerning the cognitive triad as mediator between specific parts of

the inference style and depressive symptoms can be dereived from theoretical articles written by

the authors of the hopelessness model. For example, Abramson, Seligman, and Teasdale (1978)

propose not only that individuals who make stable *or* global inferences will expect their own

future to "look black" (p. 59), but they also hypothesize that stable attributions are likely to be

related to a negative view of the self. Abramson et al. (1989) further point out the association

between inferences about the characteristics of the self and a negative view of the self (e.g.,

"patient tends to attribute his unpleasant experiences to a psychological, moral, or physical

defect in himself", p. 11, Beck et al., 1979) as proposed by Beck are logically connected. No

further associations between parts of the inference style and the cognitive triad are proposed by

the authors of the hopelessness model or by Beck. Nevertheless, as none of the refered articles

had the aim to discuss all possible associations between parts of the inference style and the

cognitive triad, it can not be excluded that additional associations exist. In addition, neither the

negative view of the self nor the negative view of the world from Beck's cognitive model (1976)

are tested as possible mediators between the parts of the inference style and symptoms of

depression. Thus, the goal of this three-wave longitudinal study is to help close this gap within

the empirical literature by comparing the original hopelessness model (with only the negative

view of the future as mediator), with a model including all proposed paths, and a more

explorative model in that all three elements of the cognitive triad are mediators between all

inference styles and depressive symptoms.

Similarly, the empirical literature exploring the associations between cognitive variables

and depressive symptoms as they relate to differences in sex or between clinically depressed

individuals and nonclinically depressed individuals is very limited. Research has indicated that

women are about twice as likely to develop depression as men (Angst, Gamma, Gastpar, Lépine,

Mendlewicz, & Tylee, 2002). However, while differences in cognitive variables between the

sexes has been well studied (see for a review Nolen-Hoeksema, 2006), there are only a few

studies about possible differences in the associations between cognitive variables as proposed by

Beck's cognitive theory Beck (1976; 1996) or the hopelessness model (Abramson et al., 1989)

and depressive symptoms (Goldstein, 2006; Stone, Gibb, & Coles, 2010). While neither of the

two cognitive theories studied here predict sex differences in the associations between cognitive

variables and depressive symptoms, both studies found that the association between stable and

global attribution of negative events and depressive symptoms was significant in women but not

in men. In addition, the interaction between inferences and life events was not significantly

associated with depressive symptoms in women in either study, or in men in Goldstein's (2006)

study. However, we are not aware of any research about sex differences in the associations

between inference style and hopelessness (negative view of the future). Thus, the possibility of

the existence of sex differences in the associations between inference style, cognitive triad, and

depressive symptoms can not be excluded.

Regarding possible differences in the associations of cognitive variables and depressive

symptoms between clinically depressed individuals and nonclinically depressed individuals,

neither of the two cognitive theories predicts differences in the associations of cognitive

variables with depressive symptoms (Abramson et al., 1989; Beck, 1976, 1996). Furthermore, in

their theoretical article which addresses the functions of cognitive constructs in Beck's cognitive

model (1976) in the development, maintenance, and recovery phase of a depressive episode,

Kwon and Oei (1994) have proposed that the different variables have different functions.

However, the sequential order of the cognitive variables in relation to each phase of depression

are equivalent to Kwon and Oei's proposition. Nevertheless, we are unaware of any study

researching this issue and possible differences in the associations between inference style,

cognitive triad and depressive symptoms can not be excluded.

Following Abramson et al. (1978, 1989) and Beck et al. (1979), it is expected that the effect of each part of the inference style is partially mediated by a negative view of the future, and that the effect of negative inferences about stability and about the characteristics of the self is partially mediated by the negative view of the self but not by the negative view of the world. Effects of negative inferences about globality and about the consequences of a negative event should not be mediated by the negative view of the self or of the world. Finally, it is predicted that all parts of the inference style continue to show direct effects on depressive symptoms at a later assessment wave. Consistent with the cognitive theories, sex differences or differences between clinically and nonclinically depressed individuals are not expected with regard to possible differences in the associations between inference style, cognitive triad, and depressive symptoms.

Methods

Participants

The sample was derived from 398 psychology students of a university in the southwest of Germany (319 women). Their ages ranged from 18 to 52 years with a mean of 23.27 years and a standard deviation of 6.57 years. Of the participating students 90 (22.6%) reported depressive symptoms above the cut-off score for clinical significant symptoms in a self-report measure (Hautzinger & Bailer, 1993). From the first to the second wave 61 students (47 women) dropped out. From the first to the third wave 87 students (66 women) droped out. There were no differences between the dropouts and remaining students in sex, $\chi^2(1) = 1.13$, $p = .287$ or depressive symptoms, $t(387) = -0.69$, $p = .494$. However, dropouts were significantly older, $t(396) = -2.02$, $p = .044$, than the remaining students.

Measures

Center for Epidemiological Studies – Depression Scale (CES – D). The CES-D (Radloff, 1977; German version: Hautzinger & Bailer, 1993) consists of 20 items and is developed as a quickly administered, economic screening instrument able to measure depressive symptoms based on self-report. Both the original version and the German version were developed based on samples of the general population and psychiatric patients (Radloff, 1977; Hautzinger & Bailer, 1993). Frequency of symptoms is rated on a four-point scale with higher numbers indicating higher frequency of occurrence. Following the German norming sample, a score of ≥ 23 represented clinical significant depressive symptoms (Hautzinger & Bailer, 1993).

Different studies compared the CES-D with the BDI/BDI-II in general, finding neither instrument to be superior. Fountoulakis et al. (2007), for example, found neither the CES-D nor the BDI (Beck et al., 1979) being superior regarding reliability, validity, and correlations to anxiety in depressed and normal samples. Similar the results in a study comparing the CES-D and BDI-II (Beck, Steer, & Brown, 1996) regarding levels of specificity and positive predictive value for current, past-year, and lifetime depressive disorder in a college sample (Shean & Baldwin, 2008). Finally, Santor, Zuroff, Ramsay, Cervantes, and Palacios (1995) found the CES-D being more discriminating than the BDI in both college students and depressed outpatients. Based on these results and the higher acceptability of the CES-D in nonclinical samples (Hautzinger & Bailer, 1993) guided our decision to use the CES-D.

All inferential statistical analyses were calculated without the CES-D items which overlap with the cognitive triad (Item 4, 8, 9, 15). This shortened CES-D still represents the factors depressed affect, positive affect, somatic/retarded activity, and interpersonal of the CES-D (Radloff, 1977).

Cognitive Style Questionnaire (CSQ). The CSQ (Abramson, Metalsky, & Alloy, 2000) measures inferences about causal attributions, consequences, and the self in relation to negative events. The CSQ consists of 24 hypothetical event scenarios which includes six interpersonal and six achievement scenarios for both the negative and positive events . The respondent is presented with the hypothetical event and is asked to write down one cause for the event. Respondents then rate the degree to which the cause of the hypothetical event was (a) internal, (b) stable, and (c) global (negative inferences for causal attributions). Next, they rate the likelihood that further negative consequences will result from the event (negative inferences of consequences). Finally, they rate the degree to which the occurrence of the event means that the self is flawed (negative inferences of the self). Each rating uses a 7-point Likert scale with higher scores representing a more depressive inference style.

A review of the original CSQ provides support for the reliability and construct validity of the CSQ (Haeffel et al., 2008). Internal consistencies of (a) a combined attribution style (globality and stability), (b) the negative inference about consequences and (c) the negative inference about the self scales reported in this review range from .83 to .91. These internal consistencies are numerical similar to the ones found in our sample (Table 1). Regarding construct validity, multiple studies found that the CSQ predicts depressive symptoms, an association mediated by hopelessness (Haeffel et al., 2008). A series of confirmatory factor analyses with our sample revealed a 4-factor model which includes only positive items fits the data better than any other tested model[1]. Thus, consistent with these confirmatory factor analyses, Abramson et al. (1989), and Metalsky and Joiner (1992), only the negative event scenarios were used in this study. Futhermore, the internal dimension of causal attributions were not included in the analysis.

Cognitive Triad Instrument (CTI). The CTI (Beckham, Leber, Watkins, Boyer, & Cook, 1986; German version: Pössel, 2010b) consists of 36, 7-point Likert items which measure positive (4 items) and negative views of the self (6 items), positive and negative views of the world (5 items each), and positive and negative views of the future (5 items each). The remaining six items are filler items that are not scored. The internal consistencies of our study (Table 1) are comparable to the ones of the German evaluation study (Pössel, 2010b). In addition, both the original and the German CTI demonstrated significant concurrent and predictive validity, respectively, in correlations with different measures of depressive symptoms (Beckham et al., 1986; Pössel, 2010b).

Procedures

Participants completed questionnaire batteries in groups of 8 to 15 at the beginning (wave 1), middle (wave 2), and end (wave 3) of the fall semester (each being 4 weeks apart). The order of the questionnaires was counterbalanced across the sample following the latin square design. Informed consent was obtained and each participant received credit for participation.

Data Analysis

In order to test the hypothesized mediation model, we used a three step approach. First, (a) the original hopelessness model with only negative view of the future mediating the associations between inference styles and depressive symptoms, (b) the proposed model, and (c) a model with all three elements of the cognitive triad mediating the associations between all inference styles and depressive symptoms, all with and without partial mediation were calculated and compared using the total sample. In order to test which model fits the data best, Cole and Maxwell's (2003) approach for multi-wave studies using structure equation models was used.

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[1] The results of these analyses can be requested by the first author.

This step of analyses was conducted with the maximum likelihood method using AMOS 18.0 to calculate structural equation models (Arbuckle, 1999). Goodness of fit of the models was tested with χ^2, χ^2/df, root mean squared of the residuals (RMSEA; Steiger & Lind, 1980), Comparative Fit Index (CFI; Bentler, 1990), and Akaike Information Criterion (AIC; Akaike, 1974). Nested models were compared by subtracting the χ^2 values as well as the *df*s of the models from each other (χ^2 difference tests). When $\Delta\chi^2$ is significant for Δdf, the models are seen as significantly different from each other.

Second, although this study was not designed for subsample analyses, we felt it would be informative for future research to test the stablility of the final model across different groups (women vs. men, nonclinical vs. clinical) was tested. To do this, multigroup analysis conducting the maximum likelihood method using AMOS 18.0 were calculated. First, the final model was run with no between-group constraints. This model was used to test for equivalence across groups when additional cross-group constraints are imposed. Then, a series of chi-square tests were conducted comparing the unconstrained model to subsequent models with increasing numbers of constraints. The constraints were applied in the following order: measurement weights, measurement intercepts, structural weights, structural covariances, structural residuals, and measurement residuals. If the chi-square change between the unconstrained model and the final model with all cross-group constraints imposed is not statistically significant, then equivalence between groups is supported. According to Byrne (2001), invariance between groups means that the groups should be analyzed together. For each model, we first report results from the multigroup analyses. Second, we report parameter estimates for the both groups from the unconstrained model as well as the paths which are significantly different between both groups in the unconstrained model.

Third, in order to test the hypothesized multiple mediators in each model, we followed

the approach of Preacher and Hayes' (2008) and calculated 95% bootstrapping confidence

intervals (CI) using the bias-corrected percentile method. Finally, to evaluate the importance of

each individual element of the cognitive triad as mediators, the contribution for each individual

mediator was tested with the product method using PRODCLIN (MacKinnon, Fritz, Williams, &

Lockwood, 2007) for the significant multiple mediators. A statistically significant individual

mediation effect exists when the confidence limits do not contain zero.

Results

Descriptive data, internal consistency, and correlations for all instruments at all three

waves are presented in Table 1. All measures are correlated with each other. Nevertheless, z-

tests comparing correlations between the three CTI subscales at wave 1 reveal that the

correlation between the negative self and negative world subscales are significantly higher than

the correlation between the negative future and negative world subscales ($z = 3.21$; $p = .001$) and

are marginally higher than the correlation between the negative self and negative world subscales

($z = 1.38$; $p = .084$). The correlation between the negative self and negative future subscales are

significantly higher than the correlation between the future and world subscales ($z = 1.82$; $p =$

.034).

Identificantion of the best Model (Using the Total Sample). To identify the model

that fits the data best, different models each allowing for direct associations of the parts of the

inference styles at wave 1 and depressive symptoms at wave 3 (partial mediation models) were

tested and compared with identical models that do not allow for these direct associations (full

mediation models) (Table 2). These models are (a) the original hopelessness model with only

negative view of the future at wave 2 mediating the associations between all inference styles at

wave 1 and depressive symptoms at wave 3, (b) the prosposed model, and (c) a model with all

three elements of the cognitive triad at wave 2 mediating the associations between all inference

styles at wave 1 and depressive symptoms at wave 3. Comparing the partial and full mediation

models reveals that each partial mediation model fits the data better than the corresponding mode

with full mediation. Furthermore, the direct associations of the parts of the inference styles at

wave 1 and depressive symptoms at wave 3 contribute equally to the improvement of the model,

independent of the other associations in the model (Table 2). Next, the proposed model was

compared with the original hopelessness model, revealing that the proposed model fits the data

significantly better than the original hopelessness model ($\Delta\chi^2$ (2, N = 398) = 10.25, p = .01).

Finally, the proposed model was compared with the model in that all three elements of the

cognitive triad mediate the associations between all inference styles and depressive symptoms

($\Delta\chi^2$ (6, N = 398) = 18.00, p = .01). The latter model fits the data better than the proposed

model. The standardized parameter estimates of these partial mediation models are presented in

Tables 3 and 4.

   Multigroup Analyses. Multigroup analyses comparing women (n = 319) and men (n =

78) indicate a partial mediation model in that all three elements of the cognitive triad at wave 2

mediate the associations between all inference styles at wave 1 and depressive symptoms at wave

3 are not stable across both sexes ($\chi^2_{\text{unconstrained}}$ (22) = 16.36, p = .798, χ^2/df = 0.74, CFI (1.00),

RMSEA (<0.01), AIC (388.36); $\chi^2_{\text{fully constrained}}$ (115) = 141.84, p = .045, χ^2/df = 1.23, CFI (0.99),

RMSEA (0.02), AIC (327.84); $\Delta\chi^2$(93) = 125.48, p = .014). However, only 2 of 33 paths across

different waves are significantly different between the female and the male subsample. The

regression weights for the paths between negative inferences about consequences of a negative

event at wave 1 and the negative view of the world at wave 2 and the path between the negative

view of the future at wave 1 and the negative view of the self at wave 2 are significantly higher

in men than in women. In addition, both paths are significant in the male subsample but not in

the female subsample (Tables 3 and 4).

Multigroup analyses comparing clinically depressed ($n = 90$) and nonclinically depressed

individuals ($n = 308$) supports the partial mediation model in that all three elements of the

cognitive triad at wave 2 mediate the associations between all inference styles at wave 1 and

depressive symptoms at wave 3 are not stable across these groups ($\chi^2_{unconstrained}$ (22) = 27.12, $p =$

.207, $\chi^2/df = 1.23$, CFI (1.00), RMSEA (0.02), AIC (399.12); $\chi^2_{fully\ constrained}$ (115) = 557.96, $p <$

.001, $\chi^2/df = 4.85$, CFI (0.77), RMSEA (0.10), AIC (743.96); $\Delta\chi^2$(93) = 530.84, $p < .001$.

Nevertheless, only 1 of 33 paths across different waves is significantly different between the

clinically depressed and the nonclinically depressed subsample. The regression weight for the

path between negative inferences about characteristics of the self at wave 1 and depressive

symptoms at wave 2 is significantly higher in clinically depressed compared to nonclinically

depressed individuals. In addition, this path is significant only in the clinically depressed

subsample but not in the nonclinically depressed subsample (Tables 3 and 4).

Tests for Mediation. In order to test for multiple mediation effects, 95% bootstrapping

confidence intervals (CI) using the bias-corrected percentile method were calculated for the total

sample and for each subsample (women, men, nonclinically depressed, clinically depressed)

separated. The results of these analyses reveal that for both the total sample and for the female

subsample, the elements of the cognitive triad at wave 2 significantly mediate the association of

negative inferences about consequences of a negative event at wave 1 depressive symptoms at

wave 3 (Table 5). Further, the cognitive triad marginally mediates the association of inferences

about consequences of a negative event with depressive symptoms in the total sample and the

female subsample. The cognitive triad does not mediate any other association between inference styles at wave 1 and depressive symptoms at wave 3 (Table 5).

Finally, to estimate the importance of the negative view of the self and the world as mediators in the hopelessness model, the individual contribution of each element of the cognitive triad while controlling for all other possible direct and indirect effects was tested for the significant or marginally significant multiple mediation effects. The results of this last step of the analyses revealed no significant effect of any individual mediator (Table 6).

Discussion

Following Abramson et al. (1978, 1989) and Beck et al. (1979), it was proposed that the effect of each part of the inference style is partially mediated by a negative view of the future, and that the effect of negative inferences about stability and about the characteristics of the self is in addition partially mediated by the negative view of the self. Furthermore, it was predicted that all parts of the inference style continue to show direct effects on depressive symptoms eight weeks later. Regarding possible differences in the associations between inference style, cognitive triad, and depressive symptoms, no sex differences or differences between clinically depressed and nonclinically depressed individuals were expected.

The study reveals several important findings with regard to these hypotheses: First, a partial mediation model with all three elements of the cognitive triad at wave 2 being associated with all inference styles at wave 1 and depressive symptoms at wave 3 but not with depressive symptoms at wave 1 fits the data better than any other tested model. Second, the details of this model are not stable across different subsamples (women vs. men, nonclinical vs. clinical). Third, no individual element of the cognitive triad at wave 2 mediated the associations between

inference styles at wave 1 and depressive symptoms at wave 3 while controlling for all other

possible mediation effects within the model.

Inspecting the significant and marginally significant paths within the partial mediation

model in that all three elements of the cognitive triad at wave 2 are associated with all inference

styles at wave 1 and depressive symptoms at wave 3 in the total sample reveals some expected

and some unexpected results. As predicted (Abramson et al., 1978, 1989), the negative view of

the future is associated with most parts of the inference style 4 weeks earlier. Unexpectedly, the

inference about the stability of the cause of a negative event does not affect the negative view of

the future. The inference about characteristics of the self is associated with the negative view of

the self as expected (Abramson et al., 1989), but inferences about the stability of the cause of a

negative event does not affect the negative view of the self. Instead, inferences about the stability

of the cause, about consequences of a negative event, and about characteristics of the self affect

the negative view of the world. Finally, contrary to the expectations, depressive symptoms do

not affect elements of the cognitive triad at an earlier wave.

The most surprising result is probably the failture to find a significant association

between the inference about the stability of the cause of a negative event with the negative view

of the future four weeks later. Nevertheless, only one study tested for associations between these

two constructs. Most studies researching the associations between inference styles and the

negative view of the future integrate the inferences about stability and globality of causes into

one score (Alloy & Clements, 1998; Metalsky & Joiner, 1992). The only exception testing for

association between the inference about the stability of the cause of a negative event with the

negative view of the future did not find a significant relation in patients with rheumatoid arthritis

(McEvoy DeVellis & Blalock, 1992).   While the lack of a significant association between the

inference about the stability of the cause of a negative event with the negative view of the future

might seem conceptually difficult, it is not inconsistent with the hopelessness model. Abramson

et al. (1989) propose that many factors, none of which is necessary or sufficient, may lead to a

negative view of the future. In addition, Abramson et al (1978) propose that individuals that

make stable *or* global inferences will expect their own future to be negative. Thus, it is possible

that significant associations in previous studies are driven by inferences about the globality of the

causes of negative events. Further research separating inferences about stability and globality of

causes of negative events is necessary to test this hypothesis.

One possible explanation for the unexpected associations between the negative view of

the world with inferences about the stability of the cause and negative consequences of an event

in the male subsample might be the stability of consequences of events and the world as

anticipated by the individual. Particularly for depressed individuals, characteristics of the world

rarely seem to change (Townsend Carlson, 2001). In addition, 8 of 10 items of the CTI world

subscale describe trait-like issues (e.g., "The world is a very hostile place."). Thus, it can be

concluded that an individual makes more stable inferences and inferences about consequences of

an event when the event was expected to be caused by outside factors (negative view of the

world). To test the hypothesis it is necessary to include the anticipated main causes of a

particular event in future research.

A close inspection of the CTI world subscale might also provide an explanation for the

association between inferences about negative characteristics of the self with a negative view of

the world. Of the 10 items in the CTI world subscale 3 items focused on internal issues of the

individual (e.g., "I am faced with many difficulties."). In addition, 4 items described behaviors

of other people who are connected with the individual in some manner (e.g., "My family doesn't

care what happens to me."). It can not be excluded that the participants interpreted these items in

a way that the described issues in these items are their own fault. For example, it is possible that

the participants believe they are to blame when their family do not seem to be interested in their

fate. This is consistent with the depressive bias to attribute the responsibility for negative events

to oneself as described by both cognitive theories studied in this research (Abramson et al., 1989;

Beck, 1976, 1979). Based on this hypothesis, higher correlations between the CTI self and world

subscales than between these subscales and the future subscale are to be expected. Analyses

finding the expected differences between the correlations provided evidence for the hypothesis

that the association between inferences about negative characteristics of the self and the negative

view of the world are likely to be caused by psychometric problems with the CTI items. As

there is currently no other instrument to measure the cognitive triad, more research which

focuses on the psychometric properties of the CTI items or the development of a new instrument

to measure the cognitive triad is needed.

Before exploring the differences in the model between women and men as well as

between nonclinical and clinical depressed subsamples, it should be pointed out that the present

study was not designed for these subanalyses. Thus, the male and the clinical subsample are

both only about 20% of the total sample. Therefore, all differences might be an artifact of

having low power to study the details of the final model in these subsamples. Having said this,

an inspection of the differences between women and men revealed that only 2 of 33 paths

between different waves are significantly different between both sexes. However, six of seven

significant or marginally significant associations between parts of the inference style and the

cognitive triad four weeks later are solely based on the female subsample. While the sex

differences are not consistent with Beck's cognitive theory (Beck, 1976; 1996) and the

hopelessness model (Abramson et al., 1989), these results are consistent with previous empirical

publications (Goldstein, 2006; Stone et al., 2010). Both studies found consistent associations

between inference styles and depressive symptoms in female samples but not in male samples.

In addition, the interaction between inferences and life events was not significantly associated

with depressive symptoms in women in both studies but in men in Stone's (2010) study. Thus,

our results and previous empirical studies demonstrate that the cognitive models are consistent

with a vulnerability model in women, but more in line with a vulnerability-stress model in men.

Considering the limitations of this study with regard to sex specific analyses and the very limited

number of studies researching for possible sex differences in the associations between cognitive

variables and depressive symptoms, future research is needed to replicate and interpret these

findings.

An inspection of the differences between clinically and nonclinically depressed

participants revealed that only 1 of 33 associations between different waves are significantly

different between both groups. Nevertheless, three of four significant associations between parts

of the inference style at wave 1 and the cognitive triad at wave 2 is solely based on the

subsample that is not clinically depressed. Besides the already mentioned small sample size for

this clinical subsample, this difference might be explainable by changes in the relations between

inference styles and cognitive triad for the development and maintenance of depressive

symptoms. For example, Abramson et al. (1989) propose that negative inference styles need to

be activated by negative events to cause a negative view of the future and depressive symptoms

(development phase). However, after the activation of negative negative styles, no further

negative events are necessary to maintain a negative view of the future. In addition, consistent

with Kwon and Oei (1994), two experimental studies with nonclinically (development) and

clinically depressed (maintenance) individuals demonstrated that schemata influenced automatic thoughts but not the other way around in nonclinically depressed individuals. In clinically depressed individuals, however, schemata and automatic thoughts influenced each other (Pössel & Knopf, 2008). Thus, the differences in the associations between inference styles and cognitive triad between the clinically and nonclinically depressive sample might be caused by real differences in cognitive processing. Nevertheless, until the findings are replicated with bigger sample sizes the differences between the subsamples with clinically depressed and nonclinically depressed participants should be interpreted cautiously.

The next major finding is the failure to establish the elements of the cognitive triad as mediators between inference styles and depressive symptoms. This result is especially surprising as we could not even establish the negative view of future as mediator between inferences and depressive symptoms, one of the central elements of the hopelessness model (Abramson et al., 1989). While contrary to the hopelessness model and some empirical studies (e.g., Alloy & Clements, 1998), this finding is consistent with other studies (Kapçi & Cramer, 2000; McEvoy DeVellis & Blalock, 1992) that did not find the negative view of the future to mediate the relations between inference styles and depressive symptoms. Moreover, it is partially consistent with a third group of studies in that the negative view of the future mediated these associations only partially (Metalsky & Joiner, 1992) or for one sex (Goldstein, 2006; Stone et al., 2010). In addition, it should be considered that all variables measured at one wave are correlated and that we simultaneously tested for mediation effects of all three elements of the cognitive triad. Thus, not only is it possible that the elements of the cognitive triad mediate the association between inference styles and depressive symptoms in ways we did not test for (e.g., inference style at wave 1 to cognitive triad at wave 1 to cognitive triad at wave 2 to depressive symptoms at wave

2/wave 3) but it is also likely that the variance explained by the three elements of the cognitive

triad overlaps. Both issues make the mediation tests in the present study very conservative and

cause an underestimation of the mediation effect.

In addition, a methodological factor that should be considered as possible explanation for

the lack of mediation effects becomes obvious in the fact that the significant paths between the

elements of the cognitive triad and depressive symptoms from wave 1 to wave 2 are different

from the significant associations of the same constructs from wave 2 to wave 3. Both results

might be evidence for nonlinear relations (Cole & Maxwell, 2003) that can be caused by a

violation of the stationarity assumption. Kenny (1979) noted that *stationarity* "refers to an

unchanging causal structure" (p. 232). Applied to the current study, the stationarity assumption

implies, for example, that the degree to which the negative view of the self produces changes in

depressive symptoms remains the same over time. In other words, it is possible that the

differences in significant regressions from wave 1 to wave 2 compared to differences from wave

2 to wave 3 might refer to an acceleration or deceleration of causal relations between the studied

constructs. Another explanation for the differences in significant regressions between the waves

is that the optimal time lag may vary from one part of the model (e.g., inferences style to

cognitive triad) to another part of the same model (e.g., cognitive triad to depressive symptoms)

or between subsamples. Finally, the selected time lag between waves may not be optimal to

represent the full causal effect of one variable on another (Cole & Maxwell, 2003).

Nevertheless, it is noteworthy that the fit of the partial mediation model is good. Thus, if a

violation of the stationarity assumption caused the previously described problems, this violation

seems to have limited impact on the model fit.

Considering the optimal lengths of the time lag, there is no previous longitudinal study to integrate all elements of the cognitive triad into the hopelessness model, but other longitudinal studies researching the associations between inference style, negative view of the future (hopelessness) and depressive symptoms with adult samples used time lags of five days to two months (Metalsky & Joiner, 1992; Stone et al., 2010). Further, longitudinal studies evaluating the causal relationships between the constructs in Beck's cognitive theory (Beck, 1976, 1996) used time lags between four weeks and six months (Kwon & Oei, 1992; Oei & Kwon, 2007; Pössel, 2010a). Thus, with a time lag of four weeks, the current study is well within the range established by previous studies. Nevertheless, it should be noted that the most of the cited longitudinal studies were limited to 2-waves (Kwon & Oei, 1992; Oei & Kwon, 2007; Metalsky & Joiner, 1992; Stone et al., 2010); they were thus not able to detect if causal relations even within Beck's cognitive model or the hopelessness model (Abramson et al., 1989) accelerate or decelerate. Thus, future research is needed that uses at least four waves to estimate the optimal time lag between measurements and to test the stationarity assumption. As the time lag between two weeks and six months seems sufficient to successfully measure the effects of most variables included in Beck's cognitive model or the hopelessness model and it is not feasible to measure all variables more often than every two weeks, it can be suggested to measure the constructs of both models every two weeks for six months, if possible.

Summarized, although the results seem contrary to the idea to integrate all three elements of the cognitive triad into the hopelessness model (Abramson et al., 1989), a closer inspection of the results supports such an integration. First, it is important to point out that there were hardly any significant effects of the cognitive triad at wave 2 on depressive symptoms on wave 3. Thus, significant mediation effects of the negative view of the self and the world can barely be

expected. In addition, that the model with all parts of the inference style affecting all three elements of the cognitive triad fits the data better than the model in that the negative view of the future is the only element of the cognitive element provides some support for the importance of the integration of the cognitive triad into the hopelessness model. Finally, significant or marginally significant associations between any part of the inference style at wave 1 and the negative view of the future at wave 2 were found three times in the total sample and four times across the subsamples. However, associations with the negative view of the self were found once in the total sample and twice across the subsamples. Associations with the negative view of the world were found even twice in the total sample and six times across the subsamples. These results emphasis especially the importance of the negative view of the world for the hopelessness model.

Some limitations of the present study need to be addressed. The sole utilization of self-report instruments can be seen as a limitation of the present research. The use of multiple methods (e.g. self-report questionnaires, interview data to measure depressive symptoms, and information processing paradigms) to assess the cognitive constructs and depression would be beneficial for future studies. Problematicaly, information processing paradigms for inference style and for the cognitive triad have yet to be developed. As self-report instruments already exist for all measured constructs, the restriction to their utilization was deemed adequate at this time. Another limitation is the restriction resulting from the utilisation of an university sample with the majority of participants being female. The homogeneity of the sample concerning sex, educational level, age range, and social environment may limit the generalizability of the results to general and clinical populations. Connected with this limitation is the small number of male participants and participants with depressive symptoms in the clinical range. This limitation is

not only a threat to the generability of the results but also to the reliability of the results in these subsamples. Thus, replication studies with large clinical samples and higher numbers of male participants are desirable.

On the other hand, methodological advantages of the research enhance confidence in the findings: A relatively large total sample combined with a 3-wave longitudinal design allowed to test the mediational effect of the cognitive triad. In addition, data analytic methods best suited to test multiple mediators in multiple wave longitudinal designs in general and mediation effects in particular have been utilized (Cole & Maxwell, 2003; Preacher & Hayes, 2008).

The results are not only important from an academic point of view, but also for clinical applications, as the presented research can be seen as a first step to develop a model integrating the hopelessness model (Abramson et al., 1989) and Beck's cognitive theory (Beck, 1976, 1996). Such an integrated cognitive model might allow us to better understand how concepts from various cognitive models interact and how different techniques influence cognitive variables. Beyond the advancement in theory, an integrative model might lead to improvement in the effectiveness of psychotherapies for depression by a theory-driven integration of therapeutic techniques that are based on the different cognitive models.

Summarizing, the presented 3-wave longitudinal study demonstrates that all three elements of the cognitive triad (Beck, 1976, 1996) should be included in the hopelessness model (Abramson et al., 1989). Nevertheless, tested individually none of the elements of the cognitive triad proved to mediate the relations between inference styles and depressive symptoms. Besides methodological issues, the rigorosity of controlling for all other direct and indirect effects might explain this result.

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Table 1

Descriptive Data and Correlations Between All Instruments at all three waves

	CES-Dt1	CES-Dt3	CSQgt1	CSQst1	CSQcot1	CSQset1	CTIst1	CTIwt1	CTIft1	CTIst2	CTIwt2	CTIft2
CES-Dt1	.90											
CES-Dt3	.38	.91										
CSQgt1	.32	.31	.82									
CSQst1	.18	.19	.64	.83								
CSQcot1	.32	.34	.76	.52	.90							
CSQset1	.37	.38	.60	.43	.65	.91						
CTIst1	-.55	-.44	-.47	-.35	-.45	-.52	.82					
CTIwt1	-.50	-.33	-.36	-.24	-.38	-.31	.58	.66				
CTIft1	-.52	-.36	-.29	-.21	-.33	-.33	.50	.38	.48			
CTIst2	-.48	-.45	-.42	-.31	-.45	-.50	.77	.51	.42	.83		
CTIwt2	-.41	-.38	-.33	-.24	-.38	-.36	.48	.70	.38	.60	.65	
CTIft2	-.42	-.44	-.30	-.22	-.36	-.37	.45	.29	.66	.56	.47	.46
Mean	15.59	16.51	37.38	41.20	31.16	29.61	33.32	25.33	26.21	33.86	25.63	26.22
SD	10.01	10.15	10.34	10.41	11.35	13.24	6.14	4.77	3.80	5.95	4.62	3.69

Note. $N = 302$ for all variables. Values in the diagonal represent Cronbach's Alpha. CES-D = CES-D witout 4 items overlapping with the CTI; CSQg = CSQ, negative events general-specific; CSQs = CSQ, stable-unstable; CSQco = CSQ, negative inference about consequences; CSQse = CSQ, negative inference about the self; CTIs = CTI, negative view of the self; CTIw = CTI, negative view of the world; CTIf = CTI, negative view of the future; t1 = assessment at beginning of the semester; t2 = assessment at middle of the semester; t3 = assessment at end of the semester. All correlations are significant at $p < .05$.

Table 2

Indices of Goodness of Fit and Parsimony of the Tested Models as well as Results of the χ^2-Tests Comparing Full and Partial Models (N = 398)

Models	df	χ^2	p-value	χ^2/df	CFI	RMSEA	AIC	Δdf	$\Delta\chi^2$	p-value
Original hopelessness model – full mediation	23	48.81	0.001	2.12	0.99	0.05	210.81			
Original hopelessness model – partial mediation	19	36.24	0.01	1.91	0.99	0.05	206.24	4	12.57	0.05
Proposed model – full mediation	21	38.56	0.011	1.84	0.99	0.05	204.56			
Proposed model – partial mediation	17	25.98	0.075	1.53	0.99	0.04	199.98	4	12.57	0.05
All associations mediated – full mediation	15	20.55	0.152	1.37	0.99	0.03	198.55			
All associations mediated – partial mediation	11	7.98	0.715	0.73	1.00	< .01	193.98	4	12.57	0.05

Note. Original hopelessness model = hopelessness model with only negative view of the future mediating the associations between inference styles and depressive symptoms; bidirectional model = hopelessness model but in addition with depressive symptoms at wave 1 effecting all elements of the cognitive triad at wave 2; all associations mediated = model with all three elements of the cognitive triad at wave 2 mediating the associations between all inference styles at wave 1 and depressive symptoms at wave 3; full mediation = a model not allowing for direct associations of the parts of the inference styles at wave 1 and depressive symptoms at wave 3; partial mediation = a model allowing for direct associations of the parts of the inference styles at wave 1 and depressive symptoms at wave 3.

Table 3

Regression Weights for associations between Waves and Z-Scores for Comparisons Between Subsamples.

	all	female	male	z-score	nonclinically depressed	clinically depressed	z-score
CSQgt1- CTIst2	-.02	.02	-.18	-1.48	-.01	.02	0.22
CSQgt1- CTIwt2	.08	.13+	-.17	1.87	.09	.12	0.20
CSQgt1- CTIft2	.12+	.10	.13	0.18	.11	.12	0.25
CSQgt1- CES-Dt3	-.02	.00	.04	0.16	-.01	-.09	-0.44
CSQst1- CTIst2	-.02	-.02	.02	0.44	.01	-.09	-0.91
CSQst1- CTIwt2	-.10*	-.10+	-.05	0.40	-.12*	-.03	0.63
CSQst1- CTIft2	-.05	-.07	.00	0.46	-.05	-.08	-0.41
CSQst1- CES-Dt3	.00	-.02	-.03	-0.09	.00	.00	0.02
CSQcot1- CTIst2	-.06	-.08	-.04	0.29	-.08	-.09	-0.31
CSQcot1- CTIwt2	-.04	-.10	.26*	2.49*	-.02	-.18	-1.00
CSQcot1- CTIft2	-.12+	-.12+	-.09	0.09	-.09	-.14	-0.51
CSQcot1- CES-Dt3	.07	.09	.03	-0.33	.10	-.02	-0.67
CSQset1- CTIst2	-.11*	-.13*	-.02	0.88	-.13*	-.02	0.78
CSQset1- CTIwt2	-.12*	-.13*	-.17	-0.42	-.12*	-.03	0.80
CSQset1- CTIft2	-.12*	-.10+	-.22+	-1.07	-.08	-.21*	-1.34
CSQset1- CES-Dt3	.16*	.14*	.06	-0.49	.06	.50***	3.33**
CTIst1- CTIst2	.63***	.65***	.52***	-1.08	.54***	.80***	1.87
CTIst1- CTIwt2	.01	.03	-.06	-0.61	-.03	.25+	1.80
CTIst1- CTIft2	.11+	.13+	.08	-0.27	.12+	.03	-0.82

CTIst1- CES-Dt2	-.17**	-.16*	-.20	-0.29	-.10	-.31*	-0.99
CTIwt1- CTIst2	.08*	.04	.21*	1.61	.11*	.01	-0.77
CTIwt1- CTIwt2	.62***	.58***	.67***	0.07	.62***	.46***	-1.60
CTIwt1- CTIft2	-.02	.00	-.12	-0.89	-.02	.04	0.54
CTIwt1- CES-Dt2	-.12*	-.10	-.18	0.38	-.12+	-.12	-0.03
CTIft1- CTIst2	.01	-.01	.17*	1.98*	.04	-.08	-1.32
CTIft1- CTIwt2	.12**	.11*	.13	0.12	.13**	.03	-1.29
CTIft1- CTIft2	.56***	.54***	.61***	0.80	.48***	.62***	0.68
CTIft1- CES-Dt2	-.06	-.08	.05	0.97	-.02	-.15	-0.79
CES-Dt1- CES-Dt2	.31***	.33***	.22+	-0.69	.30***	.17+	-1.51
CTIst2- CES-Dt3	-.07	-.15+	.18	1.92	-.09	.01	0.83
CTIwt2- CES-Dt3	-.03	-.04	-.09	-0.33	-.01	-.15	-1.09
CTIft2- CES-Dt3	-.10	-.08	-.18	-0.58	-.08	-.01	0.61
CES-Dt2- CES-Dt3	.37***	.31***	.59***	1.85	.35***	.42***	0.72

Note. CSQg = CSQ, negative events general-specific; CSQs = CSQ, stable-unstable; CSQco = CSQ, negative inference about consequences; CSQse = CSQ, negative inference about the self; CTIs = CTI, negative view of the self; CTIw = CTI, negative view of the world; CTIf = CTI, negative view of the future; t1 = assessment at beginning of the semester; t2 = assessment at middle of the semester; t3 = assessment at end of the semester. + $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4

Correlations of all Variables at the same Wave.

	all	women	men	nonclinically depressed	clinically depressed
CES-Dt1 – CSQgt1	.31***	.33***	.25*	.18**	-.08
CES-Dt1 – CSQst1	.17**	.17**	.19	.08	-.04
CES-Dt1 – CSQcot1	.31***	.34***	.21+	.17**	-.04
CES-Dt1 – CSQset1	.35***	.35***	.37**	.16**	.10
CES-Dt1 – CTIst1	-.50***	-.52***	-.44***	-.28***	-.25*
CES-Dt1 – CTIwt1	-.48***	-.55***	-.29*	-.33***	-.18
CES-Dt1 – CTIft1	-.49***	-.49***	-.47***	-.24***	-.24*
CSQgt1 – CSQst1	.64***	.64***	.67***	.60***	.72***
CSQgt1 – CSQcot1	.76***	.77***	.71***	.74***	.72***
CSQgt1 – CSQset1	.60***	.59***	.62***	.56***	.53***
CSQgt1 – CTIst1	-.48***	-.49***	-.39**	-.42***	-.39***
CSQgt1 – CTIwt1	-.32***	-.33***	-.29*	-.25***	-.11
CSQgt1 – CTIft1	-.26***	-.32***	-.05	-.16**	-.17
CSQst1 – CSQcot1	.52***	.54***	.41***	.47***	.59***
CSQst1 – CSQset1	.43***	.43***	.43***	.37***	.50***
CSQst1 – CTIst1	-.32***	-.37***	-.25*	-.29***	-.41***
CSQst1 – CTIwt1	-.19***	-.20***	-.18	-.15*	-.10
CSQst1 – CTIft1	-.17***	-.20***	-.05	-.09	-.20+
CSQcot1 – CSQset1	.65***	.64***	.69***	.62***	.57***
CSQcot1 – CTIst1	-.44***	-.48***	-.30*	-.42***	-.28*
CSQcot1 – CTIwt1	-.36***	-.40***	-.23+	-.32***	-.12
CSQcot1 – CTIft1	-.32***	-.37***	-.11	-.16**	-.35**
CSQset1 – CTIst1	-.52***	-.56***	-.37**	-.45***	-.46***
CSQset1 – CTIwt1	-.31***	-.33***	-.30*	-.25***	-.04
CSQset1 – CTIft1	-.32***	-.34***	-.21+	-.18**	-.26*

CTIst1 – CTIwt1	.58***	.58***	.58***	.47***	.54***
CTIst1 – CTIft1	.50***	.52***	.41***	.32***	.48***
CTIft1 – CTIwt1	.38***	.41***	.24*	.19***	.37**
CES-Dt2er – CTIst2er	-.30***	-.32***	-.24+	-.38***	-.04
CES-Dt2er– CTIwt2er	-.29***	-.27***	-.36**	-.32***	-.15
CES-Dt2er – CTIft2er	-.36***	-.37***	-.36**	-.37***	-.38**
CTIst2er – CTIwt2er	.40***	.40***	.33	.44***	.25*
CTIst2er – CTIft2er	.40***	.41***	.41	.40***	.44***
CTIwt2er – CTIft2er	.31***	.33***	.25	.31***	.37**

Note. CSQg = CSQ, negative events general-specific; CSQs = CSQ, stable-unstable; CSQco = CSQ, negative inference about consequences; CSQse = CSQ, negative inference about the self; CTIs = CTI, negative view of the self; CTIw = CTI, negative view of the world; CTIf = CTI, negative view of the future; t1 = assessment at beginning of the semester; t2 = assessment at middle of the semester; t3 = assessment at end of the semester; er = error term. $+ p < .10$; $* p < .05$; $** p < .01$; $*** p < .001$.

Table 5

Confidence Intervals for Multiple Mediation Effects.

		Lower CI	Upper CI
All	CSQgt1 – CES-Dt3	-.046	.007
	CSQst1 – CES-Dt3	-.006	.035
	CSQcot1 – CES-Dt3	.000	.043*
	CSQset1 – CES-Dt3	.000	.037+
Women	CSQgt1 – CES-Dt3	-.056	.007
	CSQst1 – CES-Dt3	-.009	.044
	CSQcot1 – CES-Dt3	.003	.059*
	CSQset1 – CES-Dt3	-.001	.042+
Men	CSQgt1 – CES-Dt3	-.201	.046
	CSQst1 – CES-Dt3	-.080	.069
	CSQcot1 – CES-Dt3	-.149	.079
	CSQset1 – CES-Dt3	-.048	.150
Nonclinically depressed	CSQgt1 – CES-Dt3	-.051	.010
	CSQst1 – CES-Dt3	-.014	.032
	CSQcot1 – CES-Dt3	-.004	.050
	CSQset1 – CES-Dt3	-.005	.037
Clinically depressed	CSQgt1 – CES-Dt3	-.172	.069
	CSQst1 – CES-Dt3	-.064	.079
	CSQcot1 – CES-Dt3	-.029	.151
	CSQset1 – CES-Dt3	-.063	.065

Note. CSQg = CSQ, negative events general-specific; CSQs = CSQ, stable-unstable; CSQco = CSQ, negative inference about consequences; CSQse = CSQ, negative inference about the self; CTIs = CTI, negative view of the self; CTIw = CTI, negative view of the world; CTIf = CTI, negative view of the future; t1 = assessment at beginning of the semester; t2 = assessment at middle of the semester; t3 = assessment at end of the semester. + $p < .10$; * $p < .05$.

Table 6

Confidence Intervals for Individual Mediation Effects of Significant or Marginally Significant
Multiple Mediation Effects while Controlling for all other Direct and Indirect Effects in the
Model.

		Lower CI	Upper CI
All	CSQcot1 – CTIst2 – CES-Dt3	-.004	.020
	CSQcot1 – CTIft2 – CES-Dt3	-.001	.028
	CSQcot1 – CTIwt2 – CES-Dt3	-.004	.008
	CSQset1 – CTIst2 – CES-Dt3	-.002	.013
	CSQset1 – CTIft2 – CES-Dt3	-.0009	.021
	CSQset1 – CTIwt2 – CES-Dt3	-.006	.012
Women	CSQcot1 – CTIst2 – CES-Dt3	-.0003	.037
	CSQcot1 – CTIft2 – CES-Dt3	-.003	.027
	CSQcot1 – CTIwt2 – CES-Dt3	-.007	.016
	CSQset1 – CTIst2 – CES-Dt3	-.001	.023
	CSQset1 – CTIft2 – CES-Dt3	-.002	.018
	CSQset1 – CTIwt2 – CES-Dt3	-.007	.014

Note. CSQco = CSQ, negative inference about consequences; CSQse = CSQ, negative inference
about the self; CTIs = CTI, negative view of the self; CTIw = CTI, negative view of the world;
CTIf = CTI, negative view of the future; t1 = assessment at beginning of the semester; t2 =
assessment at middle of the semester; t3 = assessment at end of the semester.