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Eyes on the Prize: A Longitudinal Study of Action–State Orientation, Affect, and Academic Self-Regulation

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CHAPTER 15

EYES ON THE PRIZE: A LONGITUDINAL STUDY OF ACTION−STATE ORIENTATION, AFFECT, AND ACADEMIC SELF-REGULATION

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ABSTRACT

Action−state orientation (ASO) describes the ability to plan, initiate, and complete intended activities. Action-oriented *individuals, compared to* state-oriented*, are better able to focus their efforts and therefore move toward goals. While* Kuhl (1994) *posits that affect mediates the relationship between personality traits like ASO and successful self-regulation, ASO scholarship rarely examines the role of affect, and no ASO studies have examined self-regulation over time. We address these limitations by examining students' academic self-regulation over a semester. HLM analyses show that action- versus state-oriented people*

exhibit better academic self-regulation as expected. However, we found no support for affect as a mediator.

INTRODUCTION

… Nothing [is] so fatiguing as the eternal hanging on of an uncompleted task.
—James (1886/2012)

Initiating action and sustaining a consistent, focused motivation to work is easier for some people than others. The individual difference of action versus state orientation (ASO) describes this ability to plan, initiate, and complete intended activities, and to effectively cope with demanding situations (Jostmann & Koole, 2010; Kuhl, 1984, 1994). Action-oriented individuals, compared to state-oriented individuals, quickly adjust to demanding situations and tend to be able to self-regulate optimally under high demands (Jostmann & Koole, 2010; Kuhl, 1994). Action-oriented people are better able to control their emotions and behaviors (Koole & Fockenberg, 2011; Koole & Kuhl, 2007; Kuhl, 2000), which contributes to their success in organizational contexts. For example, research demonstrates that action-oriented employees receive better task performance ratings due to their ability to meet deadlines, persist with goals, and allocate resources appropriately (Diefendorff, Hall, Lord, & Strean, 2000).

ASO was originally described in the context of personality systems interactions (PSI) theory (Kuhl, 1994, 2000), which posits that the successful down-regulation of negative affect is a critical mediating process that enables behavioral self-regulation and successful goal pursuit. Specifically, action-oriented people are hypothesized to experience lower negative affect when confronted with self-regulatory challenges, which subsequently contributes to their perseverance in goal pursuit. However, despite some preliminary evidence that ASO is associated with better affect control (e.g., Koole & Fockenberg, 2011), this mediated relationship that resides at the core of PSI theory has received surprisingly little empirical attention. Further, the vast majority of scholarship on ASO is cross-sectional in nature, and no studies to date have examined how ASO shapes self-regulation using longitudinal, repeated-measures designs. This is a critical limitation

of the current literature; ASO specifically concerns one's ability to remain focused on tasks and self-regulate *over time*, and cross-sectional studies may not allow for a strong test of these effects.

The purpose of the present study is to begin to address these limitations by studying self-regulation in an academic context over the course of a complete semester. We employ experience-sampling methodology (ESM) (Beal & Weiss, 2003; Csikszentmihalyi & Larson, 1987) and hierarchical linear modeling (HLM) (Raudenbush & Bryk, 2002) to test a model that examines how trait ASO affects weekly academic self-regulation through-out the semester. We further examine how trait and state negative affect mediate this relationship as posited by PSI theory (see Fig. 1). Our primary contributions are therefore to offer the first tests of (1) how ASO shapes self-regulation in a longitudinal context, and (2) how the experience of negative affect mediates this relationship, as predicted by Kuhl's (1994) PSI theory. Globally, the present chapter therefore fits within this text by pro-viding a new way of studying ASO and emotional experiences. Specifically, we examine how trait and state negative affect mediate the effect of an important, under-studied individual difference on self-regulation.

In the following sections, we begin by discussing the theoretical structure of action versus state orientation and its position in PSI theory. We then
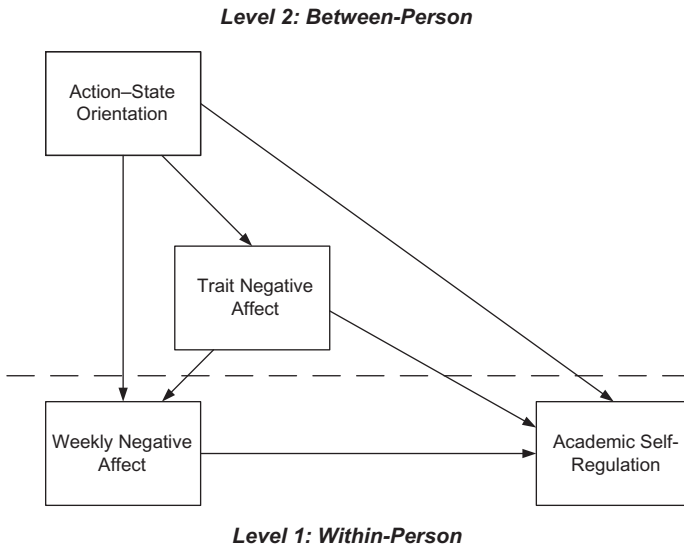

Level 2: Between-Person

Level 1: Within-Person

Fig. 1. Conceptual Model Based on Person System Interaction Theory.

provide a brief review of the empirical literature on ASO. Finally, we introduce the present study to empirically examine the relationships between ASO, state and trait negative affect, and academic self-regulation as illustrated in Fig. 1.

LITERATURE REVIEW

The Construct of Action−State Orientation

ASO refers to a person's ability to initiate and maintain intentions, including making timely decisions, avoiding procrastination, and handling multiple competing demands (Diefendorff et al., 2000; Jostmann & Koole, 2010). Research on ASO demonstrates that action-oriented individuals shield themselves better than state-oriented individuals against the psychological costs of high demands in cognition, affect, and behavior (Jostmann & Koole, 2010). Individuals with strong action orientation are able to devote their cognitive resources to present tasks, which enable them to move toward goals. Meanwhile, those who are state-oriented tend to have ruminative thoughts about alternative goals or affective states, reducing their cognitive resources available to work toward goals (Diefendorff et al., 2000).

ASO is a multidimensional construct that consists of three components: hesitation, preoccupation, and volatility (Diefendorff et al., 2000; Kuhl & Beckman, 1994). Each of these components of ASO relates to different facets of the goal-striving process (Jostmann & Koole, 2010). First, the *hesitation* dimension, with opposing poles of hesitation (state-oriented) versus initiative (action-oriented), refers to the degree of difficulty that individuals have initiating goal-directed activity. While action-oriented people are able to easily initiate work on tasks, state-oriented people lack the behavioral capacity to initiate action (Diefendorff et al., 2000; Kuhl, 1994). For example, a person with high hesitation might be expected to put off the beginning of an undesirable work task, which contributes to later difficulties when this procrastination results in insufficient time to finish his or her work.

Second, the *preoccupation* dimension contains opposing poles of preoccupation (state-oriented) versus disengagement (action-oriented). Individuals who are action-oriented on this dimension are able to disengage from thoughts of alternative goals or undesirable events that may interfere

with progress on the task at hand (Diefendorff et al., 2000; Kuhl, 1994). In contrast, those who are state-oriented on this dimension have impaired effectiveness due to their prolonged rumination regarding real or simulated, unpleasant experiences (Diefendorff et al., 2000). For example, a person high in preoccupation might ruminate extensively on setbacks or mistakes experienced earlier in the goal-striving process, rather than focusing on the demands of the present and future that can still be controlled.

Finally, the *volatility* dimension contains opposing poles of volatility (state-oriented) versus persistence (action-oriented). This dimension refers to the ability to stay in the action-oriented mode when necessary. Individuals who are more action-oriented on this dimension effectively maintain focus on an intention until the task is complete, while state-oriented individuals are easily distracted and pulled off-task (Diefendorff et al., 2000; Kuhl, 1994). For example, a person high in volatility is likely to flit between a wide set of goals that are all halfway accomplished rather than picking a single goal and persevering with focus until it is finished.

Action Control in Personality Systems Interactions Theory

ASO was originally developed as part of Kuhl's action control theory (ACT) (Jostmann & Koole, 2010; Kuhl, 1984), which was later incorporated in the broader PSI theory (Kuhl, 2000). The term *action control* relates to the psychological processes that lead to the formation and implementation (or disengagement) of intentions. ACT proposes that reactions under high demands depend on whether people are in a metastatic (change-promoting) or catastatic (change-preventing) regulatory mode (Jostmann & Koole, 2010). With a metastatic mode of control, one has ability to facilitate the enactment of intentions and activate an action orientation. In contrast, with a catastatic mode of control, people operate with a state orientation (Jostmann & Koole, 2010; Kuhl, 1984, 1994). However, these shifts between catastatic and metastatic control are momentary changes; these state transitions should not be confused with the individual difference of ASO, which describes one's overall, trait propensity to be action versus state-oriented (Jostmann & Koole, 2010).

ACT is a sub-set of Kuhl's broader PSI theory (Kuhl, 2000; Kuhl & Koole, 2004). PSI theory assumes that a hierarchy of regulatory systems mediates the relationship between motivation and personality, and therefore volitional action depends on the interplay between these regulatory functions (Koole, Kuhl, Jostmann, & Vohs, 2005; Kuhl, Kazen, & Koole,

2006). More simply, this theory attempts to explain how emotions and personality interact to affect cognition and behavior. According to PSI theory, the coordination process of goal enactment depends on affect. Specifically, being able to down-regulate negative affect allows for on-demand shifting and balance between intuitive, automatic self-regulation, and effortful, controlled self-regulation. Affect regulation thus plays a vital role in the volitional regulation of behavior through the lens of PSI theory (Koole et al., 2005; Kuhl et al., 2006).

The trait of ASO is important within PSI theory because it explains how people tend to cope with their initial affective responses (Koole & Jostmann, 2004). Under stressful conditions, action-oriented individuals engage in implicit down-regulation of negative affect. If successful, these individuals will exhibit better moods and facilitated self-regulation. Yet under the same stressful conditions, state-oriented individuals will either refrain from affect regulation or engage in relatively ineffective forms of affect regulation. This tendency leads to persistent negative affect, rumination, and inhibited self-regulation among the state-oriented. Consequently, the differences in action- versus state-oriented people may be most exacerbated under stressful conditions when extreme negative affect would be expected to occur (Koole & Jostmann, 2004). Thus, based on PSI theory, it is likely that the relationship between ASO and goal progress is mediated by affective experiences; action-oriented people are better able to self-regulate their behaviors because they are able to effectively down-regulate their experiences of negative affect and focus on the task at hand.

Empirical Studies of Action−State Orientation

Although much has been written about PSI theory, there has been considerably less empirical research on ASO since its development. The lack of empirical research on this topic is partly attributable to measurement difficulties. Kuhl (1985) created the first self-report measure of ASO, the Action Control Scale (ACS), which was later revised by Kuhl and Beckmann (1994). Diefendorff et al. (2000) examined the factor structure and construct validity of the revised 1994 scale and found it lacking; consequently, they further modified the ACS measure beyond the edits made by Kuhl and Beckmann (1994). Most subsequent research on ASO uses the Diefendorff et al. (2000) version of the ACS.

Although ASO seems conceptually similar to other personality traits, several studies have shown that ASO is empirically distinct from traits like rumination, dispositional affect, goal orientation, self-efficacy, and attentional focus (Diefendorff, 2004; Diefendorff et al., 2000; Kuhl, 1994).

Further, ASO predicts many important outcomes. For example, in the workplace, action orientation is positively related to work attitudes and supervisor ratings of job performance (Diefendorff et al., 2000), and negatively related to job search intentions (Van Hooft, Born, Taris, Van der Flier, & Blonk, 2005). The hesitation dimension of ASO in particular is predictive of self-management at work, although job satisfaction and job involvement appear to moderate this relationship (Diefendorff, Richard, & Gosserand, 2006). Specifically, individuals low in hesitation performed better when routineness, satisfaction, or involvement was low when compared to those high in hesitation. ASO has received less attention in academic contexts, but one study found that the hesitation and volatility subscales of ASO related to academic effort (Jaramillo & Spector, 2004). In the decision-making literature, ASO predicts choices after a missed attractive opportunity (Van Putten, Zeelenberg, & Van Dijk, 2009) and the tendency to hold on to failing projects after experiencing a loss in money, effort, or time (Van Putten, Zeelenberg, & Van Dijk, 2010). Action-oriented individuals also demonstrate better cognitive control than state-oriented individuals under highly demanding conditions (Jostmann & Koole, 2007).

Despite the theorized role of affect in PSI theory, much has been left unexplored regarding ASO and affect. Of the small body of research that has empirically investigated this connection, some studies have found that action-oriented individuals are faster at regulating emotions. For example, action-oriented participants were found to be more efficient at down-regulating implicit negative affect compared to state-oriented people (Koole & Fockenberg, 2011). Similarly, another study found state-oriented individuals to have longer latencies in intention initiation under low-positive affect conditions compared to action-oriented individuals (Krazen, Kaschel, & Kuhl, 2008). ASO also relates to recognizing positive emotion, as action-oriented individuals were quicker in detecting happy faces among angry crowds (Koole & Jostmann, 2004). While studies like these have begun to investigate the direct interplay between ASO and affect, none have examined the indirect effect of ASO on *behavioral* self-regulation via affective states. Further, no studies have examined the relationship between ASO, affect, and behavioral self-regulation longitudinally. This is an important oversight because of the within-person variance that can appear over time in studies of affective experiences and goal pursuit. Put simply, we know very little about how ASO relates to emotional experiences and self-regulation over time, especially in people's natural environments.

THE PRESENT STUDY

The present study aims to broaden our understanding of ASO and its effects on individuals over time. To this end, we studied a sample of students enrolled in an Organizational Psychology course in fall 2013. Student participants completed a baseline survey of individual differences, including trait ASO and trait negative affect, during the first week of classes (level 2; between-person measurements). For each subsequent week, they responded to a survey to report on weekly affective experiences and academic self-regulation pertaining to the course (level 1; within-person measurements). Academic self-regulation in this context was operationalized as the participant's estimation of the percentage of assigned reading and work for the course that he or she had successfully completed. We selected this criterion because weekly assignments are very concrete, clearly communicated goals that would be common to all students participating in the study, and the frequent measurements would allow the participants to recall with high accuracy their very recent productivity (Beal & Weiss, 2003). This process repeated each week for 14 weeks until the semester ended.

Consistent with ACT, we first expect that individuals with higher action versus state orientation will exhibit better within-person academic self-regulation. ACT posits that people with greater trait action orientation will more frequently operate in a metastatic self-regulatory mode, which should improve behavioral self-regulation (Jostmann & Koole, 2010). Consequently, we hypothesize a cross-level direct effect of trait ASO (level 2) on weekly academic self-regulation (level 1).

Hypothesis 1. Trait action orientation (level 2) is positively related to students' weekly self-regulation (level 1).

As noted previously, ACT is a more specific theory that is nested within the broader PSI theory. A central proposition of PSI theory is that the down-regulation of negative affect is critical to successful behavioral self-regulation (Koole et al., 2005; Kuhl et al., 2006). Action orientation enables behavioral self-regulation because action-oriented people are more able to down-regulate their negative affect, which allows them to initiate goal-directed action, disengage from bothersome rumination, and avoid distracting alternative behaviors (Diefendorff et al., 2000; Kuhl, 1994). Thus, the theory implies that ASO has a positive, indirect effect on behavioral self-regulation because action orientation reduces negative affect that would otherwise reduce self-regulatory success.

Based on PSI theory, we examine this mediated relationship at two levels of analysis, as shown in Fig. 1: overall trait negative affectivity measured as a between-person difference (i.e., a level-2 mediator, yielding a 2-2-1 pattern of mediation; Zhang, Zyphur, & Preacher, 2009) versus weekly state negative affectivity measured within-person (i.e., a level-1 mediator, yielding a 2-1-1 pattern of mediation; Zhang et al., 2009). We expect that action orientation should be negatively related to both trait and state negative affectivity given the propositions of PSI theory. Trait and state negative affectivity, in turn, should be negatively related to academic self-regulation, yielding positive indirect effects.

Hypothesis 2. The relationship between action orientation (level 2) and academic self-regulation (level 1) will be mediated by trait negative affectivity (level 2), yielding a positive indirect effect.

Hypothesis 3. The relationship between action orientation (level 2) and academic self-regulation (level 1) will be mediated by state negative affectivity (level 1), yielding a positive indirect effect.

METHOD

Participants and Procedure

Participants were 41 students enrolled in an Organizational Psychology course taught in fall 2013 at a small, competitive college in the Mid-Atlantic region of the United States. The participants voluntarily opted into the study, which was one of a variety of means of earning extra credit that was offered by the course instructor, who is the first author. Participants completed a baseline survey online during the first week of classes containing the level-2, between-person measurements of individual differences (ASO and trait negative affect). Each week, the participants were sent a follow-up online survey on Friday afternoon to measure the level-1, within-person measurements of state variables (weekly state affect and academic self-regulation). Responses to the weekly survey were time-stamped and due by Sunday afternoon; any late responses that fell in the following week were discarded. Because the first author was the course instructor, data collection for the weekly surveys concerning academic self-regulation was managed by the third author, a student collaborator and peer of the participants. The first author did not have access to this data

until final grades had been submitted. This procedure was transparently explained to the student participants at the beginning of data collection to ensure that they felt safe when honestly reporting poor academic self-regulation. Further, the instructions for the weekly survey reminded participants of this data collection strategy.

Ultimately, two participants dropped out of the study after withdrawing from the course early in the semester. The remaining 39 respondents could provide a maximum of 546 measurements of the level-1 variables over 14 weeks. At the end of the semester, we found that all participants had provided between 10 and 14 weekly responses for a total of 531 measurements (i.e., 97.3% of the maximum possible total).

The final sample reported a mean age of 19.6 years ($SD = 0.99$) and was 66.7% female. With respect to class rank, the sample consisted of 15.4% freshmen, 38.5% sophomores, 28.2% juniors, and 17.9% seniors. Psychology majors accounted for the majority of the sample (64.1%) and participants reported a mean GPA of 3.42 ($SD = 0.38$). Participants' final grades in the focal course ranged 76−97%.

Measures

Action−State Orientation (level 2). The individual difference of ASO was measured using the revised ACS (Diefendorff et al., 2000). This 22-item measure consists of question stems followed by two response options: one action-oriented, and one state-oriented. The presentation order of the options is randomized across questions. A sample item reads, "When I know I must finish something soon …" with response options of "… I have to push myself to get started" (state-oriented) or "… I find it easy to get it done and over with" (action-oriented). The scale is scored such that higher scores indicate a greater *state* orientation, which reflects greater self-regulatory dysfunction. Diefendorff and colleagues have reported extensive validity evidence for this revised measure (Diefendorff, 2004; Diefendorff et al., 2000, 2006). We found that $\alpha = .71$ for the overall scale, and that $\alpha = .72$ for the volatility subscale, .75 for the hesitation subscale, and .71 for the preoccupation subscale.

Trait Negative Affectivity (level 2). We measured trait negative affect with the 10 adjective items from the Positive and Negative Affect Scale (PANAS) (Watson, Clark, & Tellegen, 1988). We asked respondents to indicate the way that they generally tend to feel across situations to capture an overall trait measurement. Sample items include "upset" and "distressed," and responses are made on a five-point scale where 1 = "strongly

disagree" to 5 = "strongly agree." Higher scores indicate greater trait negative affectivity. The PANAS is the most widely-used measure of dispositional affectivity, and it has consistently demonstrated strong psychometric properties across hundreds of published studies (Tuccitto, Giacobbi, & Leite, 2010). We found that $\alpha = .84$ in this study.

State Negative Affectivity (level 1). Following typical practice (e.g., Beal & Weiss, 2003), we utilized shorter measurements for our within-person, level-1 measurements. Shorter measures are necessary in repeated-measures studies to minimize participant fatigue and to ensure attentiveness when completing the same measurements many times throughout the study (i.e., 14 times in this study). Accordingly, we measured state negative affect with a shortened, five-item measure made of items from the PANAS (i.e., afraid, nervous, upset, ashamed, hostile). However, we modified the instructions to ask participants to respond only with respect to their feelings during the last week. Responses are made on a five-point scale where 1 = "strongly disagree" and 5 = "strongly agree." Higher scores indicate greater weekly negative affectivity. We found that $\alpha = .79$ in this study.

Academic Self-Regulation (level 1). As noted previously, we operationalized academic self-regulation as the percentage of the weekly assigned work that the student had completed in the focal course. Responses were made on a slider scale from 0% to 100%. Responses ranged along the entire response scale from 0% to 100% ($M = 90.1\%$, $SD = 19.62\%$).

RESULTS

Preliminary Analyses

Table 1 reports correlations and descriptive statistics for level-2, between-person variables. As shown in the table, some interesting and unexpected relationships emerged between the variables. First, we found that ASO was unrelated to trait negative affect ($r = .24$, $p = .14$), although the relationship trended in the expected direction. Second, although the subscales of ASO (preoccupation, hesitation, and volatility) were unrelated to the final course grade, we observed that overall GPA was related to preoccupation and hesitation. Although hesitation was negatively related to GPA, preoccupation curiously exhibited a positive relationship ($r = .42$, $p < .05$). Hesitation-related

Table 1. Correlations and Descriptive Statistics for Level-2, between-Person Variables.

	M	SD	1	2	3	4	5	6	7	8	9
1. Gender	–	–	–								
2. Final grade	90.02	5.01	−.18	–							
3. Academic rank	–	–	−.09	−.30	–						
4. Overall GPA	3.42	0.38	−.01	.69**	−.09	–					
5. Overall ASO	8.56	3.68	−.19	−.08	−.07	−.07	–				
6. Preoccupation subscale	4.44	2.02	−.15	.25	−.38*	.42*	.46**	–			
7. Hesitation subscale	2.97	2.31	−.13	−.23	.12	−.39*	.73**	−.14	–		
8. Volatility subscale	1.15	1.51	−.07	−.19	.15	−.17	.69**	.00	.45**	–	
9. Negative affect	2.37	0.63	−.20	−.16	−.08	−.41*	.24	.00	.21	.27	–

Note: Gender is code such that 1 = male, 2 = female.

**p < .01; *p < .05.

inability to initiate work is seemingly detrimental to overall academic performance, but preoccupied rumination seems to facilitate academic performance.

Tests of Hypotheses

Because we collected multilevel data with weekly responses nested within individual students, we tested our hypotheses using HLM (Raudenbush & Bryk, 2002). We began by running an unconditional, intercept-only model to evaluate the variability in the level-1 academic self-regulation criterion with an intraclass correlation. Results indicated that 71.68% of the variability in student academic self-regulation was within-person, whereas the remaining 28.32% of variability was between-person (i.e., variability due to individual differences). Thus, there is a substantial amount of variability in academic self-regulation both between and within people that justifies the use of a multilevel analysis strategy.

Our model in Fig. 1 specifies that ASO will have a direct, positive cross-level effect on academic self-regulation (Hypothesis 1). This effect will also be mediated by trait negative affect (Hypothesis 2) and state negative affect (Hypothesis 3). We also included in our model a monotonically increasing variable that represented the week of the semester in which each response occurred. This variable allowed us to model the effect of time on academic self-regulation (Beal & Weiss, 2003), which is important given that (1) a few participants missed the occasional week of data collection, and (2) academic self-regulation might be expected to naturally fluctuate over the course of a long semester. We conducted a random-coefficient regression model (Raudenbush & Bryk, 2002) in which the level-1 variable of time (i.e., week of the semester) predicted academic self-regulation. Results indicated that time was negatively related to academic self-regulation ($\gamma_{10} = -0.75$, $p < .01$), indicating that participants completed less of the assigned work per week as the semester progressed, presumably due to overload and fatigue. Consequently, we retained this control variable in all analyses that follow.

We proceeded through a series of analyses in HLM to test our hypotheses. Fig. 1 and our mediation hypotheses imply that we have two dependent variables: state negative affectivity and academic self-regulation. First, we built on the unconditional model to test a slopes-and-intercepts-as-outcomes model of academic self-regulation, which adds level-1 variables (week of semester, state negative affect) and level-2 variables (ASO, trait negative affect) as predictors of academic self-regulation. All level-2 predictors were grand-mean centered, and all level-1 predictors were

group-mean centered as recommended by Enders and Tofighi (2007). This model tests the cross-level effect of ASO on academic self-regulation (Hypothesis 1). It also tests the direct effects of trait and state negative affect on academic self-regulation, which are prerequisites for these variables to mediate the relationship between ASO and academic self-regulation (Hypotheses 2 and 3).

The results of this analysis are shown in Table 2. As reported in this table, ASO had a significant, negative cross-level effect on academic self-regulation in support of Hypothesis 1 ($\gamma_{02} = -1.09$, $p < .05$); as state orientation increased, average academic self-regulation over the course of the semester decreased. The control variable, time of the semester, retained a significant negative effect on academic self-regulation at level 1 as well, but neither trait nor state negative affectivity had significant effects on academic self-regulation. Because the negative affectivity mediator variables were unrelated to the criterion variable, Hypotheses 2 and 3 concerning mediation could not be supported.

We then followed the same procedures to test a slopes-and-intercepts-as-outcomes model of state negative affect, which adds the level-1 control variable (week of semester) and level-2 variables (ASO, trait negative affect) as predictors of state negative affect. As shown in Table 3, none of these variables were significant predictors of state negative affectivity, contrary to our expectations in Hypotheses 2 and 3. As a further supplemental test, we re-ran these analyses using the subscales of the ASO measure (i.e., preoccupation, hesitation, and volatility), but found no further support for any dimensions predicting state negative affectivity.

Table 2. Slopes and Intercepts as Outcomes Model for Academic Self-Regulation.

Predictor Variable	b	SE	T
For intercept 1, β_0			
Intercept 2, γ_{00}	90.01	1.69	53.20***
Trait negative affectivity, γ_{01}	1.61	1.96	0.82
Action–state orientation, γ_{02}	−1.09	0.44	−2.49*
For week of semester (control), β_1			
Intercept 2, γ_{10}	−0.71	0.26	−2.76**
For state negative affectivity, β_2			
Intercept 2, γ_{20}	0.54	1.49	0.36

Note: Robust standard errors reported.
*$p < .05$; **$p < .01$; ***$p < .001$.

Table 3. Slopes and Intercepts as Outcomes Model for State Negative Affectivity.

Predictor Variable	b	SE	T
For intercept 1, β_0			
Intercept 2, γ_{00}	1.74	0.07	25.58***
Trait negative affectivity, γ_{01}	0.09	0.13	0.72
Action−state orientation, γ_{02}	0.02	0.02	0.76
For week of semester (control), β_1			
Intercept 2, γ_{10}	0.00	0.01	−0.02

Note: Robust standard errors reported.
***$p < .001$.

DISCUSSION

PSI theory states that ASO and affect are important determinants of behavioral self-regulation, but no empirical research to date has examined their effects with a repeated-measures longitudinal design. The present study hypothesized that individuals higher in action orientation would exhibit better academic self-regulation over the course of a semester, and that trait and state negative affect would mediate this effect. The results of this study demonstrate that ASO does predict students' average academic self-regulation, with action-oriented people completing a greater percentage of their assigned work throughout the semester. This finding is consistent with ACT (Jostmann & Koole, 2010; Kuhl, 1984) and demonstrates in a naturalistic setting how individuals who are chronically able to adopt a metastatic self-regulatory mode exhibit better behavioral control. This is an important finding, as no previous research has studied the benefits of action orientation over time.

However, we found no support for the proposed mediating mechanism of negative affect. PSI theory states that action-oriented people exhibit better behavioral control because they down-regulate negative affect, which results in greater ability to exercise self-regulation (Koole et al., 2005; Kuhl et al., 2006). Contrary to the theory, our results indicate that ASO was unrelated to either state or trait levels of negative affect, and that state and trait negative affect were unrelated to academic self-regulation. The observed direct effect of ASO on academic self-regulation occurred independently of negative affect. Consequently, our mediation hypotheses were unsupported.

Why did we find little support for the effects of negative affectivity? Several possibilities are evident. For example, the effects of ASO on affect

regulation may be evident only in severely stressful situations (Koole & Jostmann, 2004). Stressful situations elicit higher levels of negative affect, and the benefits of action orientation in controlling this negative affect may be most observable in these extreme conditions. Everyday academic life for students may not elicit such strong negative emotional reactions that would allow us to observe an effect of ASO on weekly state negative affectivity. Alternatively, our small sample size at level 2 ($N = 39$) may have left us under-powered to detect a cross-level effect of trait negative affectivity on weekly academic self-regulation, although we note that we had a large within-person sample size ($N = 531$) for detecting any possible level-1 effects of state negative affectivity on academic self-regulation.

Future Research Directions and Limitations

Our findings point to the need for much more research to examine ASO with longitudinal designs and in naturalistic settings using methodological approaches like ESM (Beal & Weiss, 2003). Only a small body of research has examined the effects of ASO in the workplace (e.g., Diefendorff et al., 2000), despite the importance of everyday self-regulation to successful job performance. The effects of ASO are likely to be especially strong in work contexts, where decisions involve high stakes (which might prompt extensive hesitation and preoccupation about choices) and where multiple work goals are simultaneously in play (which creates distractions for volatile individuals).

We also note that future research might integrate ACT and PSI with other prominent theories of self-regulation. For example, self-determination theory (SDT) (Ryan & Deci, 2000) concerns the distinction between intrinsic and extrinsic goals. We suspect that action orientation has weaker effects on self-regulation when the goals in question are intrinsic rather than extrinsic. Intrinsic goals arise from within the self and are typically pursued out of satisfaction, which should result in less need for the down-regulation of negative affect that is theorized to help action-oriented individuals maintain their focus. Thus, future studies of ASO and self-regulation might consider the extent to which the goals being self-regulated have become internalized and are self-versus externally determined.

Our findings also raise questions about the dimensions of ASO that should be studied in future research on academic self-regulation. Specifically, we observed that the preoccupation dimension was associated with *greater* academic performance (GPA) in our initial correlational

analyses, which runs contrary to ACT theory. It may be the case that academic performance is enhanced by frequent rumination about academic obligations, although this same preoccupation may exert costs in the form of heightened stress and diminished well-being. Future research should attempt to replicate this finding and explore the implications of ASO for academic performance and adjustment in greater detail (Jaramillo & Spector, 2004).

Future research should also address some limitations that we must acknowledge in our design. First, we note that we studied self-regulation within a very narrow context (i.e., regulation of academic workload for a particular course), and our results might not generalize to other performance domains. Second, our between-person sample size is small, which yields low statistical power for detecting level-2 effects. Replication with larger sample sizes would consequently be beneficial. Third, our mean level of academic self-regulation was considerably high, likely because the study was conducted at a competitive institution with well-prepared, traditional college students. Replication among a more variable population of students might result in less restriction in this criterion and the observation of effects that were not significant in this study. Lastly, it is possible that student participants engaged in impression management despite our efforts to communicate that the course instructor would be blind to their responses. Students may have over-reported their academic self-regulation and under-reported their state negative affect out of concern about how they might be appraised by the instructor. In future replication, it might be beneficial to collect data from a class taught by an instructor who is entirely blind to the study and who will never have access to the data.

CONCLUSION

Initiating and maintaining goal-focused self-regulation is challenging at times for virtually everyone. Research on ASO provides insight into the individual differences and within-person dynamics that result in greater ability to self-regulate in important performance domains, like school and work. The results of this study provide the first evidence that ASO has longitudinal benefits on academic self-regulation, providing important support for ACT. However, much more research is needed to test PSI theory and examine the possible role of affect as a mediator of this effect given our unsupported hypotheses in this study.

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