Action control and dispositional hope: An examination of their effect on self-regulated learning

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Abstract

Introduction. The present study examined the effect of action control (i.e., disengagement, initiative, and persistence) and dispositional hope (i.e., pathways thought, and agency thinking) on self-regulated learning strategy use (i.e., cognitive, metacognitive, and resource management) and course achievement.

Method. A total of 275 undergraduate students at School of Education participated in the study. Data were collected during a psychology course. The participants were asked to respond to the Action Control Scale (ACS-90) and the Adult Dispositional Hope Scale (ADHS). They also completed the Learning Strategies Scales of the MSLQ. Examination grades were used as the measure of course achievement.

Results. The results from path analysis suggest that the two components of dispositional hope influenced the use of almost all the learning strategies. Disengagement and initiative were found to influence mainly time and study environment management and effort regulation. Persistence and pathways thought made an independent contribution to the variance of course achievement, whereas metacognition and time and study environment management mediated the effects of disengagement, initiative and agency thinking.

Discussion and **Conclusion:** In conclusion, the main contribution of the present study is the identification of the impact that trait-like characteristics, such as action control and dispositional hope, might have on university students' self-regulated learning strategy use and course achievement.

Keywords: action control; course achievement; dispositional hope; self-regulated learning strategies.

Control de la acción y disposición de espera: un estudio de su incidencia en la autorregulación del aprendizaje

Resumen

Introducción. La presente investigación examinó el efecto del control acción (i.e., liberación, iniciativa, y persistencia) y la disposición de espera (i.e., vias de pensamiento, y pensamiento de la agencia) sobre el uso de estrategias de aprendizaje autorregulado (i.e., cognitiva, meta-cognitiva, y gestión de recursos) y el logro académico.

Método. En total 275 estudiantes de pregrado en Escuelas de Educación participaron en la investigación. Los datos se han recogido durante una asignatura de Psicología. Los participantes fueron invitados a contestar la Escala de Control de Acción (ACS-90) y la Escala de Disposición de Espera en Adultos (ADHS). También cumplimentaron las Escalas de Estrategias de Aprendizaje de MSLQ. Las calificaciones académicas fueron utilizadas como medida de logro académico.

Resultados. Los resultados del análisis muestran que los dos componentes de la disposición de espera ha influido el uso de casi todas las estrategias de aprendizaje. La separación y la iniciativa influyen sobre todo en el tiempo y la gestión del ambiente de estudio, y sobre la regulación del esfuerzo. La persistencia y las vias de pensamiento han hecho una contribución independiente en la diferencia del logro académico, visto que metacognición, tiempo y gestión del ambiente de estudio mediaron los efectos de separación, iniciativa y control del pensamiento.

Discusión y **Conclusión.** La contribución del presente estudio es la identificación de las características, como el control de la acción y la esperanza disposicional, como recursos del aprendizaje autorregulado en los estudiantes de la universidad.

Palabras Clave: rendimiento académico, control de acción, disposición de espera, estrategias de autorregulación.

Introduction

The last 20 years, considerable progress has been made as regards the concept of self-regulated learning, its constituents and its functioning (Pintrich, 2000; see Torrano & Gonzalez, 2004). The process of self-regulation refers to the persons' monitoring and controlling of their performance, cognition, and affect as well as their environment in order to achieve their goals (Efklides, Niemivirta, & Yamauchi, 2002; Pintrich, 2000). The importance of self-regulated learning is well established, particularly in secondary or college students, since it has been shown that self-regulated learners' attributes are positively related to academic achievement and to quality of learning and performance (Boekaerts, 1997; Pintrich & De-Groot, 1990; Schunk & Zimmerman, 1994).

In general, two ideas are widely endorsed in the research of self-regulated learning. First, the idea that self-regulation incorporates different systems and processes that monitor and control behavior, such as attention, metacognition, motivation, emotion, and action control (e.g., Kuhl & Fuhrmann, 1998; Zimmerman, 1999). Second, the idea that it is important for researchers on self-regulation to study the actual use of self-regulated learning strategies in academic settings (Zimmerman, 1999). Under the second idea's framework, self-regulation in academic setting has been conceived of as a set of skills that can be developed, rather than unchangeable or genetically rooted (Pintrich, 1995). As a result, various aspects of self-regulated learning have been often conceptually treated as situational, context dependent variables, while little attention has been devoted to the connection between self-regulated learning and individual trait-like characteristics (Bartels, Magun-Jackson, & Kemp, 2009; Bidjerano & Dai, 2007; Hong & O'Neil, 2001). Although individuals' predispositions to develop and exercise self-regulatory skills may be a less recognized source of self-regulated learning, in his action control theory of self-regulation, Kuhl (1985) identified action-state orientation as an individual difference perspective on stylistic differences regarding self-regulation of action.

Since one of the unanswered questions as regards the concept of self-regulated learning is to what extent it is associated with stable personality dispositions, this study is about a set of self-regulated learning strategies, identified in previous research as being core elements of the self-regulated learning processes, and their relationship with two goal-related dispositions, namely action control and dispositional hope.

Self-regulated learning strategies

Researchers have identified a number of different self-regulatory processes that explain the complexity and variability in students' efforts to learn on their own. The interest in this study was in self-regulation in terms of the proposed by Pintrich (1999) model of self-regulated learning comprising three general categories of strategies: cognitive learning strategies, metacognitive control or self-regulatory strategies, and resource management strategies like managing and controlling one's own time, effort, study environment etc.

Cognitive strategies (including rehearsal, elaboration, organization, and critical thinking) are ways that learners manipulate information in response to task requirements, such as choosing between main and trivial information and focusing of attention (Pintrich, 1999; Pintrich & DeGroot, 1990). Cognitive strategies may or may not reflect a deep level of processing (Pintrich, 1999). Rehearsal, the most basic learning strategy for processing of information, represents a verbal repetition of a material with the goal of memorization. Elaboration, a higher order learning skill, is operationally defined as paraphrasing and summarizing. Organization includes strategies such as outlining, taking notes and connecting different aspects of the material studied. The learning strategy of Critical Thinking consists of critical evaluations of ideas and application of knowledge to new situations (Pintrich, Smith, Garcia, & McKeachie, 1991).

Metacognitive strategies (i.e., planning, monitoring, and regulating), often considered the main aspect of self-regulated learning, represent executive functions designed to assess and control the use of cognitive strategies (Pintrich *et al.*, 1991). Planning involves setting educational goals and outcomes as well as task analysis. Self-regulated learners set specific learning or performance outcomes, and then monitor the effectiveness of their learning methods or strategies and respond to their evaluations. Monitoring is essential in enhancing learning. It helps students focus their attention on and discriminate between effective and ineffective performance and reveals inadequate learning strategies. It improves time management as well.

Resource Management strategies (the effective use of time and study environment, effort regulation, peer learning, and help seeking) seek to establish conditions that facilitate learning (Pintrich *et al.*, 1991). Management of Study Environment requires locating a place

that is quiet and relatively free of visual and auditory distractions and allows the student to concentrate. Time Management involves scheduling, planning, and managing one's study time. The strategy of Effort Regulation is close in meaning to volition and can be viewed as an action control strategy (Kuhl, 1985). In terms of modern volition theory, it reflects a commitment to completing one's study goals by directing and controlling one's energy toward them, and by dealing with seatbacks and failure in the process of learning; allocating more effort to unsuccessfully performed tasks. In an academic situation, effort regulation can be used to build learning skills gradually and to help students handle many distractions in and outside of schools (Chen, 2002). Peer Learning is using a study group or friends to help learn (Pintrich *et al.*, 1991). Help Seeking refers to looking for help from others – peers and instructors - in event of encountered learning difficulties (Pintrich *et al.*, 1991). Seeking assistance from others is a proactive, self-regulated learning strategy that can provide the foundation for autonomous achievement.

In sum, it has been shown that self-regulated learners' attributes, such as organizing and transforming information, monitoring the effectiveness of their learning methods, and utilizing environmental resources, seem to be positively related to and directly implicated in performance, and successful adaptation to school.

Action control, self-regulated learning strategies, and performance

Action-state orientation is a global personality construct that concerns individual differences in the ability to regulate emotions, cognitions and behaviors to accomplish intentional actions (e.g., Kuhl, 1994b). The action-state orientation construct is measured on a continuum with two polar ends: action-orientation and state-orientation.

Because of its focus on the dynamic, process-oriented issues of goal-striving, action-state orientation may be useful in understanding why two individuals who have similar goals, knowledge, ability, and desire to perform well nevertheless fail to achieve the same level of performance. Although individuals likely fall in a continuum of action-state orientation, it is helpful to contrast those individuals who are more action-oriented versus those who are more state-oriented. Individuals with a strong action orientation are able to devote their cognitive resources to the task at hand, thus enabling them to expediently move from a present goal state to some desired future goal state. These individuals flexibly allocate their attention for

the purpose of task execution and goal attainment. Persons who are more action oriented are characterized by enhanced performance efficiency (Kuhl, 1994b) and the ability to complete tasks after minor failures or setbacks. Alternatively, individuals with more of a state orientation tend to have persistent, ruminative thoughts about alternative goals or affective states, which reduce the cognitive resources available for goal-striving. This reduction of available resources impairs state-oriented individuals' ability to initiate activities and to follow tasks through to completion, especially when the activities are difficult, nonroutine, or both (Brunstein & Olbrich, 1985; Kuhl, 1994b). In addition to the general notion of action-state orientation, Kuhl (e.g., Kuhl & Beckmann, 1994) further suggests that three separate aspects or dimensions can be distinguished: Preoccupation (versus Disengagement), Hesitation (versus Initiative), and Volatility (versus Persistence).

Preoccupation (vs. Disengagement) dimension. This dimension, with opposing poles of preoccupation versus disengagement, indicates the degree to which individuals explicitly process information related to some past, present, or future state. The action-oriented pole of this dimension (disengagement) refers to the ability to detach from thoughts about alternative goals or undesirable events that may interfere with progress on the task at hand. In contrast, the state-oriented pole is associated with impaired effectiveness due to the perseveration of thoughts related to some unpleasant experience (real or simulated), often involving failure (see Diefendorff, Hall, Lord, & Strean, 2000; Kuhl, 1994a).

Hesitation (vs. Initiative) dimension. This dimension, with opposing poles of hesitation versus initiative, refers to the degree to which individuals have difficulty initiating intended goal-directed activities. Action-oriented individuals on this dimension (initiative pole) are able to easily initiate work on tasks. Although both the initiative and the disengagement dimensions are similar in their focus on the ability to move forward with tasks and to escape from state-oriented processing when necessary, they have different bases. Specifically, the disengagement dimension is concerned with whether distracting thoughts interfere with initiating action, whereas the initiative dimension emphasizes the behavioral capacity to initiate action (see Diefendorff *et al.*, 2000; Kuhl, 1994a).

Volatility (vs. Persistence) dimension. This dimension with opposing poles of volatility versus persistence is concerned with the ability to stay in the action-oriented mode when necessary. It refers to the degree to which individuals become distracted when working on an

interesting or necessary task. More action-oriented individuals (persistence pole) are able to effectively maintain focus on an intention until the task is complete, whereas more state-oriented individuals are easily pulled off-task, impairing their overall performance. State-oriented processing associated with the volatility dimension may be due to an overactivity of the action initiation system (and hence a tendency to inappropriately initiate new tasks), rather than the underactivity of this system seen in the state-oriented poles of the preoccupation and hesitation dimensions (see Diefendorff *et al.*, 2000; Kuhl, 1994a).

Thus, the three action-orientation dimensions relate to different facets of the goal-striving process. Action-oriented individuals flexibly disengage from irrelevant concerns (disengagement), effectively initiate required actions (initiative), and stay focused until tasks are completed (persistence).

Implied to the above statement is the notion that an action orientation is more adaptive than a state orientation during performance and selection of effective problem solving strategies (e.g., Brunstein & Olbrich, 1985; Kuhl, 1994b), although reviews of the literature (Kuhl & Fuhrmann, 1998) have revealed that a state orientation is not always dysfunctional. Perry, Hladkyj, Pekrun, and Pelletier (2001) examined action control using only the Preoccupation subscale, cognitive elaboration and metacognitive self-monitoring strategies using the scales adapted from MSLQ, note taking using a single item and academic achievement using final course grade. They found that students who were high in failure preoccupation took more notes during lectures and had better final grades. Students' use of elaboration and metacognitive strategies was not significantly correlated to failure preoccupation. Bembenutty, Karabenick, McKeachie, and Lin (1998) examined action control using a scale based on the behavioral component of the more extended action control scale of Kuhl (1985). They also assessed students' academic performance and learning strategy use using a modified version of MSLQ. Action control was found to be positively correlated to students' use of all of the cognitive, metacognitive and self-regulatory strategies, except for critical thinking, attention and peer learning. Papantoniou (2002) examined the effect of action control on learning strategy use and cognitive performance. Action orientation (disengagement, initiative and persistence) was measured using Kuhl's (1994b) 36-item ACS-90. She assessed self-regulation through two categories of strategies: 1) deep strategies, and 2) learning techniques. Path analyses showed that initiative and persistence facilitate cognitive performance (on text comprehension and spatial orientation) via regulating students' learning strategy use. Jaramillo and Spector

(2004) examined the effect of action control on effort and academic performance. Action orientation (disengagement, initiative and persistence) was measured using Diefendorff *et al.*'s (2000) 22-item scale, which is based on Kuhl's (1994b) 36-item scale. According to their model, initiative and persistence are positively related to effort, which is an important antecedent of academic performance. Diefendorff (2004) examined the role of action-state orientation in predicting task-specific motivation and performance in an academic context. Action orientation (disengagement and initiative) was measured using the respective subscales of Diefendorff *et al.*'s (2000) 22-item scale. The results of his study showed that disengagement and initiative predicted performance independent of goal orientation, cognitive ability, self-efficacy and self-set goals. Roy, Vezeau, and Bouffard (2008) examined action control using only the Preoccupation and the Hesitation subscales. They assessed self-regulation through four categories of strategies: 1) planning and organization, 2) efforts to understand further, 3) engagement, and 4) perseverance. They found that failure preoccupation only barely links to self-regulation. Roy, Vezeau, and Bouffard (2008) also found that students' use of all self-regulatory strategies was negatively correlated to hesitation. In sum, the recent empirical evidence illustrates an inconsistent pattern of action control relationships to self-regulated learning strategies and performance variables.

Dispositional hope and performance

Similarly to action control, hope seems to have considerable promise as a goal-related construct: one of the ways through which people manage their goals and adapt to everyday life challenges is hope. Hope contributes to one's life fulfilment and longevity, and for this reason is identified in positive psychology as a human strength (Danner, Snowdon, & Friesen, 2001; Kashdan, Pelham, Lang, Hoza, Jacob, Jennings, Blumenthal, & Gnagy, 2002).

Over the past decade, hope has become well established as an essential coping strategy across a variety of domains including academics (see Snyder, 2000). Although it is common to equate hope with wishful thinking (as in "hope for the best"), Snyder and his colleagues (Snyder, Harris, Anderson, Holleran, Irving, Sigmon, Yoshinobu, Gibb, Langelle, & Harney, 1991) have defined hope with a precise, operational meaning. In this study, hope is conceptualized in terms of the theory of Snyder *et al.* (1991; see also Snyder, 2000) as a goal-directed disposition, which consists of two interrelated but distinct components: (a) Waypower or pathways thought, which reflects the perceived ability to produce alternative paths – i.e., cognitive

strategies toward desired or valued goals - as well as to talk positively to the self about being able to find these paths. (b) Willpower or agency thinking, which reflects the motivational dimension of hope. It refers to the perceived ability to endorse agency self-talk. Agency thinking takes on special significance when people encounter impediments. In such situations agency thinking and self-talk help the person to direct the required motivation to the best pathway (Snyder, Rand, & Sigmon, 2002). Put in another way, people who are high in hope have both the "ways" and the "will" to achieve their goals. According to the theory, pathways thought and agency thinking work in concert; they are "reciprocal, additive, and positively related" (Snyder *et al.*, 1991, p. 370). This duality of the agency and pathways components of hope is what clearly distinguishes hope from self-efficacy. Self-efficacy, a belief in one's capabilities to organize and execute courses of action (Bandura, 1997), shares some similarity to the agency (willpower) component of hope, but it differs from hope in that it does not incorporate the pathways component.

Research has shown that hope in both its trait and state forms is an effective predictor of various performance-related behaviors (Snyder, 2000). Curry, Snyder, Cook, Ruby, and Rehm (1997) found that among athletes, state hope mediated the relationship between trait hope and athletic performance. Peterson, Gerhardt, and Rode (2006) tested and found partial support for a model of relationships among trait hope, state hope, learning goal orientation, verbal cues, and task performance. As regards hope variables, they found that a learning goal orientation had a significant positive relationship to trait hope and that trait hope was positively related to performance on an anagram task through the mediating variable of state hope.

Although a solid understanding of the role of hope in task performance will lend insight into the relative effectiveness of hope as a performance-enhancing construct, to our knowledge, the degree to which hope relates to self-regulated learning and graded performance has not yet been adequately explored.

Aim - Hypotheses

Therefore, the present study aimed at examining the effect of action control (i.e., disengagement, initiative, and persistence) and dispositional hope (i.e., pathways thought, and agency thinking) on self-regulated learning strategy use (i.e., cognitive, metacognitive, and resource management) and course achievement.

Since recent studies have generally shown that action control can be correlated to self-regulated learning strategies, we hypothesized that action orientation can be associated with the use of cognitive, metacognitive and self-regulatory strategies (Hypothesis 1). Specifically, based on the studies of Bembenutty *et al.* (1998), Jaramillo and Spector (2004), Papantoniou (2002), and Roy, Vezeau, and Bouffard (2008) we hypothesized that initiative and persistence can be positively associated with the learning strategy use (Hypothesis 1a), while, based on Perry *et al.* (2001) findings, we expected negative associations between disengagement and self-regulated learning strategies (Hypothesis 1b).

Although relationships between dispositional hope and specific self-regulation learning skills have not been established, we hypothesized that the concept of hope as one's perceived ability to (1) clearly conceptualize goals, (2) develop the specific strategies to reach the goals (pathways thought), and (3) initiate and sustain the motivation for using these strategies (agency thinking) (Snyder, 2000; Snyder *et al.*, 2002) can be associated with the use of self-regulation learning skills (Hypothesis 2).

Since trait individual differences are more distal from performance than are learning strategy use individual differences, we hypothesized that the relationships of action control and dispositional hope with graded performance should be indirect through self-regulation learning skills. Specifically, since several studies (Bidjerano & Dai, 2007; Chen, 2002; see Bandalos, Finney, & Geske, 2003) have shown that metacognitive strategies along with resource management strategies emerged as good predictors of performance, action control and trait hope were expected to have an indirect effect on course achievement by virtue of metacognitive and resource management strategies (Hypothesis 3).

Method

Participants

The total sample consisted of 275 volunteer undergraduate students (11 male, 264 female, mean age = 20.4 years, *SD* = 2.8, age-range = 18-39 years) attending either the School of Education, at the Universities of Ioannina and Thessaly, or the School of Psychology, at the Aristotle University of Thessaloniki, in Greece.

Instruments

The Action Control Scale (ACS-90). In order to assess differences in action-state orientation, Kuhl (1985) developed the Action Control Scale, ACS (German version is the HAKEMP), which is a self-report instrument. Since its original development, the ACS has gone through three revisions, the most recent version being the ACS-90 (see Diefendorff *et al.*, 2000). The ACS-90 consists of 36 items, divided equally into three subscales measuring failure-related, decision-related and performance-related action orientation (Kuhl & Beck-mann, 1994).

The items of the scale depict brief scenarios that occur in every day life and require selection of one of two options that indicate what the participant would do. One of the options is indicative of action orientation and the other of state orientation. For scoring the test values, using the action-oriented answers is recommended by the constructor. A score of one is assigned to responses that correspond to action orientation and zero to state orientation responses. Scores are added for each of the three subscales with larger scores denoting a higher action orientation. Example items are the following: for the Preoccupation Scale "If I had just bought a new piece of equipment (for example, a tape deck) and it accidentally fell on the floor and was damaged beyond repair: A. I would manage to get over it quickly. B. It would take me a long time to get over it."; for the Hesitation Scale "When I know I must finish something soon: A. I have to push my self to get started. B. I find it easy to get it done and over with."; for the Volatility Scale "When I read something I find interesting: A. I sometimes still want to put the article down and do something else. B. I will sit and read the article for a long time."

Previous empirical and theoretical works have implied several a priori competing models for the ACS factor structure. The first and most parsimonious of these models is a one-factor model, which is consistent with the idea of a global, unitary action-state orientation construct. The second model, a two-factor model, suggests that there are two latent constructs influencing ACS responses – the ability to escape the state-oriented mode of processing (assessed by preoccupation and hesitation items) and the ability to stay in the action-oriented mode of processing (assessed by volatility items). The third a priori model, a three-factor model, is implied by most previous empirical and theoretical work with the ACS measure, and suggests that preoccupation, hesitation, and volatility are separate constructs.

In an attempt to improve the ACS, Diefendorff *et al.* (2000) examined the factor structure of the ACS-90 performing confirmatory factor analyses and comparing the above mentioned three models. Initial confirmatory factor analyses of three models showed poor fit with the data. Items that did not perform well were dropped, and the three models were retested, resulting in a support for a three-factor solution corresponding to the failure-related (AOF), decision-related (AOD) and performance-related (AOP) action orientation subscales. The revised Action Control Scale retained 8 from the original 12 AOF subscale's items, 8 from the original 12 AOD subscale's items, and 6 from the original 12 AOP subscale's items.

For the purposes of a previous study the ACS-90 has been translated into Greek by the first author and back translated by one independent bilingual psychologist (see Papantoniou 2002; Papantoniou & Efklides, 2004). The back-translated questionnaire was then compared to the original and a few minor modifications were applied.

We examined the factor structure of the Greek version of the Action Control Scale, using confirmatory factor analyses[1] to compare the three a priori factor structures, implied by previous theory and empirical research, but none of the models fit the data especially well (Papantoniou, Moraitou, Dinou, & Katsadima, submitted). Consequently, a second set of confirmatory factor analyses of the three models was performed, using a revised item set of the three ACS-90 subscales. In the revised item set, we excluded 14 items which were proposed by Diefendorff *et al.* (2000) as poorly performing. Four items were excluded from the AOF subscale (Items 1, 7, 16, & 25) and the AOD subscale (Items 14, 17, 23, & 32). Six items were eliminated from the AOP subscale (Items 6, 9, 12, 18, 27, & 30). The models using the revised item set yielded a noticeably better fit to the data than did the first set of analyses. Thus, on the basis of the chi-square difference tests, comparisons of CFI, and the low value of its RMSEA and SRMR, the best-fitting model was unambiguously the three-factor model with interrelations between the latent factors, $\chi^2(206, N = 323) = 259.90$, $p = .006$, $\chi^2/df = 1.26$, CFI $= .921$, SRMR $= .051$, RMSEA $= .029$ (CI$_{90\%}$ .020 to .039) (Papantoniou *et al.*, submitted). Moreover, this model also has the advantage of previous theoretical and empirical validation (see Diefendorff *et al.*, 2000).

As shown in Table 1, confirmatory factor analysis verified the three-factor structure of the revised ACS-90 for this sample, namely Failure-related, Decision-related, and Perfor-

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[1] For all confirmatory factor analyses EQS 6.1 (Benler, 2005) was used.

mance-related action orientation, $\chi^2(206, N = 275) = 277.7$, $p < .001$, $\chi^2/df = 1.01$, CFI = .894 (marginal), SRMR = .055, RMSEA = .036 (CI$_{90\%}$ .024 to .046) (see Brown, 2006). Cronbach's α values have been .70 for the Preoccupation Scale, .68 for the Hesitation Scale, and .58 for the Volatility Scale. In previous work, either on the original and revised English version (Diefendorff *et al.*, 2000; Jaramillo & Spector, 2004; Kuhl, 1994b) or on the original Greek version (Papantoniou, 2002), Cronbach's α coefficients, for the three subscales, were ranged from .51 to .78. In this study, as well as in previous studies, the internal consistency of the three subscales of the ACS-90 tend to be slightly low, probably because its estimates based on alpha are likely underestimates given that the items are dichotomous and do not meet the tau-equivalence conditions (Cortina, 1993, p.101).

Table 1. The structure of the revised Action Control Scale (standardized solution), in the test sample

Items	Factors				
	AOF (F1)	AOD (F2)	AOP (F3)	E	R^2
AOF4	.470			.883	.221
AOF10	.525			.851	.275
AOF13	.371			.929	.138
AOF19	.453			.891	.205
AOF22	.445			.896	.198
AOF28	.474			.880	.225
AOF31	.591			.807	.349
AOF34	.468			.884	.219
AOD2		.375		.927	.140
AOD5		.385		.923	.148
AOD8		.440		.898	.194
AOD11		.423		.906	.179
AOD20		.565		.825	.319
AOD26		.514		.858	.264
AOD29		.536		.844	.287
AOD35		.417		.909	.174
AOP3			.198	.980	.039
AOP15			.632	.775	.399
AOP21			.230	.973	.053
AOP24			.474	.881	.224
AOP33			.673	.739	.453
AOP36			.333	.943	.111
Factor Correlations					
F2 (AOD) – F1 (AOF)	.495				
F3 (AOP) – F1 (AOF)	.088				
F3 (AOP) – F2 (AOD)	.335				

Note: AOF = The Failure-related Action Orientation factor; AOD = The Decision-related Action Orientation factor; AOP = The Performance-related Action Orientation factor.

The Adult Dispositional Hope Scale (ADHS). The Snyder *et al.* (1991) ADHS is a 12-item scale designed to tap dispositional hope in adults. Four of its items refer to pathways thought and four of its items to agency thinking. Example items are the following: for the pathways though "There are lots of ways around any problem"; for the agency thinking "My past experiences have prepared me well for my future". Finally, four items are distracters (e.g., "I feel tired most of the time"). The data gathered by these last four items were not included in the analysis.

For the purposes of a previous study the ADHS was translated into Greek by the second author (Moraitou, Kolovou, Papasozomenou, & Paschoula, 2006). Participants had to answer whether each of the 12 items was true for themselves, on a 5-point Likert-type scale from 1 (not true at all) to 5 (very true) and not on the 8-point-scale proposed by Snyder *et al.* (1991; see also Moraitou *et al.*, 2006). Confirmatory factor analysis verified the two-factor structure of ADHS for this sample, namely Waypower or 'Pathways Thought' and Willpower or 'Agency Thinking', $\chi^2(19, N = 275) = 60.30$, $p < .001$, $\chi^2/df = 3.44$, CFI = .907, SRMR = .065, RMSEA = .089 (CI$_{90\%}$ .064 to .115), (see Brown, 2006). The internal consistency for the factors was: Cronbach's $\alpha = .74$ and .61, respectively.

The Motivated Strategies for Learning Questionnaire (MSLQ). The MSLQ was developed by Pintrich *et al.* (1991) as a measure of self-regulated learning. Two sections comprise the MSLQ, a motivational section and a learning strategies section. In this study the learning strategies section was used to assess college students' use of different learning strategies in college courses. The learning strategies section of the MSLQ consists of 50 items, divided into nine subscales measuring: rehearsal, elaboration, organization, and critical thinking (representing the cognitive aspect of the self-regulated learning); metacognition (representing the metacognitive construct of self-regulation); and environment and time management, effort regulation, peer learning, and help seeking (representing the management component of self-regulation). Responses are provided on a 7-point Likert type scale anchored by 1 (not at all true of me) and 7 (very true of me). An example from the subscale used to measure elaboration is "When reading for this class, I try to relate the material to what I already know". An example from the subscale used to measure metacognition is "When I study for this class, I set goals for myself in order to direct my activities in each study period". An example from the subscale used to measure study environment management is "I usually study in a place where I can concentrate on my course work".

The MSLQ instrument has been used widely in investigating students' motivation and learning strategies in many countries, such as Arabia, Australia, Canada, China, Japan, and Taiwan (see Chen, 2002). For the purposes of this study the learning strategies section of MSLQ was translated into Greek by two of the authors and an independent bilingual person. The two versions of the translated questionnaire were then compared and the modifications suggested by the bilingual person were applied to the translated by the authors' version of the questionnaire. Confirmatory factor analysis verified the nine-factor structure of the learning strategies section of the MSLQ for this sample, in terms of some fit indices that were found to be comparable to those used by Pintrich *et al.* (1991), in order to confirm the nine-factor structure: $\chi^2(1139, N = 275) = 2635.4$, $p < .001$, $\chi^2/df = 2.31$, LISREL GFI = .71, SRMR = .09 (Pintrich *et al.*, 1991: $\chi^2/df = 2.26$, LISREL GFI = .78, SRMR = .08). Based on the aforementioned indices, Pintrich *et al.* (1991, p. 79-80) claimed: "While the goodness of fit indices is not stellar, they are, nevertheless, quite reasonable values, given the fact that we are spanning a broad range of courses and subject domains. Motivational attitudes and deployment of the various learning strategies may differ depending upon course characteristics, teacher demands, and individual student characteristics. Overall, the models show sound structures, and one can reasonably claim factor validity for the MSLQ scales".

Cronbach's alpha internal consistency estimates, obtained in the present study, were also found to be comparable to those obtained by Pintrich *et al.* (1991): $\alpha = .66$ (Pintrich *et al.*, 1991: $\alpha = .69$) for rehearsal, $\alpha = .71$ (Pintrich *et al.*, 1991: $\alpha = .76$) for elaboration, $\alpha = .82$ (Pintrich *et al.*, 1991: $\alpha = .64$) for organization, $\alpha = .67$ (Pintrich *et al.*, 1991: $\alpha = .80$) for critical thinking, $\alpha = .59$ (Pintrich *et al.*, 1991: $\alpha = .79$) for metacognition, $\alpha = .72$ (Pintrich *et al.*, 1991: $\alpha = .76$) for environment and time management, $\alpha = .70$ (Pintrich *et al.*, 1991: $\alpha = .69$) for effort regulation, $\alpha = .64$ (Pintrich *et al.*, 1991: $\alpha = .76$) for peer learning, and $\alpha = .53$ (Pintrich *et al.*, 1991: $\alpha = .52$) for help seeking.

Course achievement. Course achievement was measured by student's final course grade, which was converted to a 10-point scale ($M = 6.52$; $SD = 2.33$). Final course grade was assessed with (a) a 3-point essay, which involved the production of original prose on topics assigned by the instructor, and (b) a 7-point exam, which required recall of information from textbooks and was administered at the end of the semester.

Procedure

Prior to conducting the study, institutional permission for conducting research with human subjects was obtained. The survey was administered to students in four introductory courses in psychology (including mainly topics of educational, cognitive and developmental psychology). Although the courses were taught by two different instructors (a post doctoral student and a lecturer), some textbooks and similar class assignments were utilized across the four different courses. Questionnaires were administered in the classroom. The ACS-90 and the ADHS were administered at the beginning of the semester. Participants answered in writing the two questionnaires which were presented in random order. They also provided demographic information, including age, gender, and class level prior to completing the questionnaires. The MSLQ was administered during a second session at the end of the semester. Participation in the study was voluntary and participants were informed that all results were confidential.

Statistical Analysis

Considering that path analysis –a structural equation modeling (SEM) technique for analyzing structural models with observed variables, is adequate for examining relationships among multiple constructs measured using summated scales (Jaramillo & Spector, 2004) and has been widely used in the self-regulated learning literature, we proceeded with this analysis. Specifically, to examine the relationships between the dimensions of action orientation, dispositional hope, self-regulated learning strategies and course achievement, a path analysis with manifest variables was computed. Because of the relatively small sample size, analysis was not run at the item level. Instead, the covariance matrix was based on total scores for disengagement, initiative, persistence, pathways thought, agency thinking, rehearsal, elaboration, organization, critical thinking, metacognition, environment and time management, effort regulation, peer learning, help seeking and course achievement. The graded performance and the nine self-regulated learning strategies were defined as endogenous variables. The three dimensions of action orientation as well as the two components of dispositional hope were defined as exogenous variables.

Path analysis was conducted in EQS Version 6.1 and performed on covariance matrix using the Maximum Likelihood estimation procedure (Bentler, 2005). Starting from the covariance matrix, different models were computing using Maximum Likelihood estimates. Ini-

tially, in the structural part of the model, the three action control and the two dispositional hope independent variables incorporated in the path model were allowed to correlate and predict the nine latent variables of self-regulated learning strategies and the dependent variable of course achievement. Simultaneously, the latent self-regulation learning strategies variables were allowed to correlate and predict the dependent variable of course achievement as well. Several iterations, which included suggested modifications, indicated by Lagrange Multiplier and Wald tests, resulted in the final model. The Wald test was used to test the need for these regressions and to suggest a more restricted model.

A non-statistical significance of the χ^2-test indicates that the implied theoretical model significantly reproduces the sample variance-covariance relationships in the matrix. Since this test is sensitive to sample size, model fit was also evaluated by using the root mean squared error of approximation (RMSEA). The RMSEA tests how well the model would fit the population covariance matrix. A rule of thumb is that RMSEA $\leq$ .05 indicates close approximate fit and values between .05 and .08 suggest reasonable error of approximation (Kline, 2005). The Comparative Fit Index (CFI) which is one of the indexes assessing the relative improvement in fit of the researcher's model compared with a baseline model was also used. A rule of thumb for the CFI is that values greater than .90 may indicate reasonably good fit of the researcher's model (Kline, 2005). In addition, model fit was evaluated by using the standardized root mean squared residual (SRMR). The SRMR is a measure of the mean absolute correlation residual, the overall difference between the observed and the predicted correlations. Values of the SRMR less than .10 are generally considered favourable (Kline, 2005).

As regards the sample size requirements, for SEM techniques, it is recommended as a rule of thumb that there be at least five observations per estimated parameter (Hair, Anderson, Tatham, & Black, 1998). A total of 15 parameters were estimated in path model. Hence, the sample size for path model had to exceed 75. Thus, the sample size exceeded the minimum recommended level for performing path analysis.

Results

Path analysis. The structural part of the final model is displayed in Table 2 and the correlations among independent variables of the model are displayed in Table 3. The overall

fit of this model was good, $\chi^2(30, N = 275) = 33.05$, $p = .321$, $\chi^2/df = 1.10$. Results indicate that SRMR is .044, and RMSEA is .019 ($CI_{90\%}$ .000 to .051), suggesting a good fit the data (see Brown, 2006). Also, CFI (.997) exceed the .90 threshold, indicating an adequate fit (see Brown, 2006).

Table 2. Path model displaying relationships among action control, dispositional hope, self-regulated learning strategies and course achievement

Dependent Variables	Independent Variables								
	AOF	AOD	AOP	HOWI	HOWAY	Metac	TSEM	E	R^2
Rehearsal	-.171			.287				.950	.098
Elaboration				.244	.107			.951	.095
Organization				.229				.973	.053
Critical Thinking				.170	.123			.968	.064
Metacognition		.126		.269				.941	.114
TSE Management	-.141	.258		.332	-.092			.897	.195
Effort Regulation	-.147	.205		.286				.917	.158
Course Achievement			-.171		-.141	.139	.287	.915	.163

Note: AOF = The Failure-related Action Orientation variable; AOD = The Decision-related Action Orientation variable; AOP = The Performance-related Action Orientation variable; HOWI = The Hope Willpower variable; HOWAY = The Hope Waypower variable.
Only significant independent variables' effects are presented in the table.

As hypothesized in H1 and H3, we found that two dimensions of action orientation, disengagement and initiative, were related to the use of some cognitive, metacognitive and self-regulatory strategies. Specifically, initiative was positively related to metacognitive, time and study environment management, and effort regulation strategies. It seems that a student's capacity to initiate intended actions explains metacognitive and time and study environment management strategy use, which in turn is translated into greater graded performance. Disengagement was found to be negatively related to rehearsal, time and study environment management and effort regulation. Since time and study environment management is related positively with course achievement, a student's ability to stop thinking about alternative goals or undesirable events that may interfere with progress on the task at hand as well as the ability to not get stuck at an initial state of goal attainment could inhibit achievement via regulating inappropriately time and study environment management.

Table 3. Correlations among independent variables of the path model displayed in Table 2

Correlations among Independent Variables	
HOWI – HOWAY	.466
AOF – HOWAY	.217
AOD – HOWAY	.323
AOP – HOWAY	.153
AOF – HOWI	.140
AOD – HOWI	.387
AOP – HOWI	.276
AOD – AOF	.337
AOP –AOD	.237
Elaboration – Rehearsal	.487
Organization – Rehearsal	.666
Critical Thinking – Rehearsal	.173
Metacognition – Rehearsal	.498
TSE Management – Rehearsal	.522
Effort Regulation – Rehearsal	.315
Organization – Elaboration	.540
Critical Thinking – Elaboration	.467
Metacognition – Elaboration	.564
TSE Management – Elaboration	.257
Effort Regulation – Elaboration	.236
Critical Thinking – Organization	.268
Metacognition – Organization	.481
TSE Management – Organization	.380
Effort Regulation – Organization	.242
Metacognition – Critical Thinking	.403
TSE Management – Metacognition	.427
Effort Regulation – Metacognition	.386
Effort Regulation – TSE Management	.555

Note: AOF = The Failure-related Action Orientation variable; AOD = The Decision-related Action Orientation variable; AOP = The Performance-related Action Orientation variable; HOWI = The Hope Willpower variable; HOWAY = The Hope Waypower variable.
Only significant correlations are presented in the table.

Contrary to H3, however, we found that persistence is directly and negatively related to graded performance. Unexpectedly, it seems that a student's capacity to remain focused on goal-related activities until completion is translated into lower course achievement during a typical, rather easy, and routine introductory psychology course examination. Another unexpected finding, by contrast with H1a, was the lack of relationships between persistence and self-regulated learning strategies.

As hypothesized in H2 and H3, we found that the two components of dispositional hope, agency thinking and pathways thought, were related to the use of several cognitive, me-

tacognitive and self-regulatory strategies. Specifically, agency thinking was positively related to the use of all of the cognitive, metacognitive and self-regulatory strategies, except for peer learning and help seeking. Since metacognition and time and study environment management are related positively with course achievement, a student's perceived ability to endorse agency self-talk when he encounters impediments facilitates course achievement via regulating effectively metacognitive and time and study environment management strategy use.

Pathways thought was found to be positively related to the cognitive strategies of elaboration and critical thinking. However, it was also found to inhibit course achievement via regulating inappropriately time and study environment management. Finally, contrary to H3, pathways thought was found to be directly and negatively related to course achievement. It indicates that a student's perceived ability to produce alternative cognitive strategies toward valued goals and to talk positively to the self about being able to find these strategies impedes graded performance either directly or indirectly via inappropriate regulation of resource management strategy use.

Discussion

The main aim of this study was to examine the relationships between action control and dispositional hope, on the one hand, and learning strategy use and course achievement, on the other.

As for the predictive efficacy of action control and dispositional hope on self-regulated learning strategies, agency thinking stands out from the other constructs. Specifically, agency thinking was found to positively affect the use of rehearsal, elaboration, organization, critical thinking, metacognition, time and study environment management, and effort regulation. This is in accordance with its definition as "individuals' perceptions regarding their capacities to clearly conceptualize goals and to initiate and sustain the motivation for using the specific strategies to reach those goals" (Snyder *et al.*, 2002). This finding can also be explained taking into account the similarity shared between the agency (willpower) component of hope and self-efficacy, since self-efficacy beliefs are strong predictors of educational outcomes and have been shown to correlate with self-regulatory processes (Bandura, 1997).

Pathways thought appears to influence positively some higher order learning skills, such as elaboration and critical thinking. This finding could be explained on the basis of the complex nature of the aforementioned strategies that is associated to one's ability to view a problem from multiple perspectives. However, waypower as an elaborative pursuit of alternative cognitive strategies seems to impede performance, either directly or indirectly via inappropriate regulation of resource management strategy use, in terms of its "time consuming" and more "creative" than "executive" nature.

Overall, several interesting results are derived from this study as regards the three dimensions of action control. Specifically, initiative was found to positively affect the use of metacognition, time and study environment management, and effort regulation. This finding is consistent with previous research (Bembenutty *et al.*, 1998; Jaramillo & Spector, 2004; Papantoniou, 2002; Roy, Vezeau, & Bouffard, 2008) indicating that, due to their greater ability to get things done, decision-related action oriented individual are willing to monitor the effectiveness of their learning, to manage effectively their time and study environment and to exert a greater effort on leaning abilities, despite potential distractions.

Contrary to decision-related action orientation, failure-related action orientation appears to block rehearsal, time and study environment management and effort regulation. It seems that quick disengagement from failure may lead the person to bypass causal search that adds to effective self-regulation. Since time and study environment management is related positively with course achievement, this finding is consistent with the literature showing that being preoccupied with failure can improve performance (Diefendorff, 2004; Kuhl & Fuhrmann, 1998; Perry *et al.*, 2001). Another finding confirming that state orientation is not always dysfunctional was the negative effect of persistence on course achievement. Research indicates that state-oriented individuals operate at their optimum when they are allowed sufficient time and freedom from pressure, and when they receive explicit instructions on the activities to be completed. Although these conditions are not usual fulfilled during a typical course examination, these findings indicate that students involved in this study experienced friendly examination environment and close guidance. In sum, the results of this study tend to reinforce the inconsistent pattern of action control effects on learning strategy use and performance.

In sum, action control and dispositional hope, as goal-related volitional and motivational constructs respectively, were found to be associated with the use of all of the cognitive, metacognitive and self-regulatory strategies, except for peer learning and help seeking. It is possible that peer learning and help seeking are different from other learning strategies in that they are also social interactions. Therefore, it is likely that social motives will influence the use of these strategies.

In addition, the study uncovered that self-regulated learning strategies, particularly metacognition and time and study environment management, mediate the relationship between disengagement, initiative, pathways thought and agency thinking, on the one hand, and course achievement, on the other. These findings are consistent with previous research indicating that metacognition and time and study environment management are two of the most salient predictors of academic achievement (Bidjerano & Dai, 2007; Chen, 2002; see Bandalos, Finney, & Geske, 2003). Specifically, these results suggest that, students who tend to monitor the effectiveness of their learning and to manage effectively their time and study environment are likely to perform better in an introductory psychology undergraduate course compared to their counterparts lacking these qualities. Taking also into account the negative effects of persistence and pathways thought on graded performance of this course, it seems that students who describe themselves as low in persistence and pathways thought are likely to succeed high course achievement.

Finally, an interesting finding is the association of the action control with the dispositional hope. As both of them are goal-directed constructs, one plausible explanation for this relationship could be the fact that failure-related, decision-related and performance-related action oriented individuals become able to detach from thoughts about alternative goals that may interfere with progress on the task at hand, to easily initiate work on task and to effectively maintain focus on an intention until the task is complete because of their ability to direct the required motivation to the best pathway via agency thinking and self-talk and to produce alternative strategies toward the task.

The present study provides some of students' antecedent characteristics and their potential impact on learning that educators need to be aware of. Specifically, this study found that self-regulated learning strategies and course achievement have important correlates to trait-like characteristics, such as action control and dispositional hope. Without discounting

the assumption that self-regulated learning, in general, is learnable characteristic, the results of the present study suggest that educators should be aware of the personality predispositions each student brings to a specific learning situation (see Bidjerano & Dai, 2007). From an intervention point of view, formal and informal assessment of students' action control and dispositional hope may inform the instructor as to who will naturally develop self-regulatory skills and who may not develop these skills without explicit training. Consequently, with the knowledge of the relationship between these two goal-related constructs and self-regulated learning, teachers will be in a better position to design individualized interventions accordingly.

A limitation of this study is the use of self-reported measures of self-regulatory skills. More rigorous designs are needed to establish the validity of the relationship between academic self-regulation and trait-like characteristics using behavioral and observational measures of self-regulation (i.e., real-time measurements of learning strategies or videotape assessment of strategies) (see Dermitzaki, 2004). The restricted nature of the sample should also be noted, especially with regard to age and gender. It is also unknown if the same pattern of results would be obtained if college students of others Schools, than School of Education, were involved. Future research should further clarify, in different college students groups and in different age groups, how action control and hope predispose individuals to employ self-regulated learning, and how these dispositions interact with learning conditions in developing relevant self-regulated strategies.

In conclusion, the impetus of this study was to bring to attention some deep connections among self-regulated learning, action control and dispositional hope, rather than providing definitive answers. Therefore, the main contribution of the present study is the identification of trait-like characteristics, such as action control and dispositional hope, as a source of university students' self-regulated learning.

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