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**“Perceived parental autonomy support as a predictor of psychological needs and academic motivation in Greek and Dutch students: A cross-cultural comparison based on the Self-Determination theory.**

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## Abstract

**Aim** According to the Self-Determination Theory (SDT) Perceived parental autonomy support predicts adolescent need satisfaction (autonomy, competence, relatedness) and intrinsic academic motivation. The current study aimed to examine whether perceived parental autonomy support predicts need satisfaction and intrinsic academic motivation for both Greek and Dutch students. Cross-cultural scholars claim that parental autonomy support may be at odds with the values of collectivism, which entails hierarchy and parental dominance. Greece is considered a more traditionally collectivistic society than the Netherlands. Thus, we investigated how cultural differences in terms of collectivism-individualism between groups would predict parental autonomy support, need satisfaction, and intrinsic motivation. **Method** The sample consists of 129 students from which 107 are Greek students and 22 Dutch students (68% girls,  $M_{age} = 17,27$  years,  $SD_{age} = 0,70$ ). The following questionnaires were given to the participants: 1) Perception of Parents scale (POPS), 2) Self-regulation Questionnaire-Academic Domain (SRQ-A), 3) The basic psychological need satisfaction and frustration scale, 4) The Individualism and Collectivism scale. **Results** ANOVA revealed no statistical differences between Greek and Dutch students in perceived parental autonomy support and need satisfaction. The most remarkable difference between the two groups was found in the subscales: vertical collectivism, horizontal collectivism, intrinsic motivation, identification and introjection in which Greek participants scored higher. Regression analysis indicated that vertical collectivism predicts maternal and paternal autonomy support, but only maternal autonomy support predicts autonomy satisfaction. No significant effects were found between parental autonomy support, competence, relatedness and intrinsic academic motivation. Only paternal autonomy support has a negative effect on introjected and external regulation. **Discussion.** The results echo the proposal of SDT that the need for autonomy is universal and its satisfaction is essential to individual's optimal functioning across cultures. The results showed that parents have a differentiating effect on adolescent's need satisfaction and motivation. Intervention parenting programs could gain from the results by taking into consideration the parental differences for future implementation on their intervention program.

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*Key words:* Self-determination theory, parental autonomy support, needs satisfaction, intrinsic academic motivation, collectivism, individualism

## Introduction

Adolescence is a period in which several changes and challenges emerge. First, adolescents physically and emotionally distance themselves from their parents, claiming their autonomy (Soenens et al., 2007). At the same time, the sense of relatedness with their peers and parents becomes increasingly important, playing a significant role in the development of their identity (Kroger, 2000). Also, their school performance becomes important for their sense of competence. Several studies have indicated the positive association between academic achievement and intrinsic motivation (Zhou, Ma & Deci, 2009; Froiland, 2010; Katz, Kaplan & Buzukashvily, 2011). Furthermore, in order for adolescents to be intrinsically motivated in school requires from their social context and especially their parents to provide them with their need for autonomy. A great deal of studies have shown the positive relation between perceived parental autonomy support with intrinsic academic motivation and adolescents' need satisfaction for autonomy, competence and relatedness (Cordeiro, Paixão, & Lens, 2015; Inguglia et al., 2015).

Although the relation between parental autonomy support and need satisfaction appears robust, it may vary across cultures. Culture holds a significant impact on adolescents' perceptions and interpretations of parental behavior, in terms of being perceived autonomy supportive or more controlling. (Lekes, Gingras, Philippe, Koestner & Fang, 2009). Therefore, the aim of this study is to examine the role of culture, between two different culturally oriented countries (Greece and Netherlands) on adolescents' parental behaviors, need satisfaction and motivation.

The present study is based on the Self-Determination Theory (SDT), a macro theory of human motivation concerned with the development and functioning of personality within social contexts. Central to SDT is the satisfaction of three psychological needs: autonomy, competence and relatedness. In SDT these needs are considered universal nutrients that must be satisfied for effective functioning and well-being. When exposed to controlling, critical or rejecting social contexts, people experience a feeling of need frustration, while supportive environments provide an experience of need satisfaction (Costa, Gugliandolo, Barberis, Cuzzocrea & Liga, 2018).

In SDT, parents are considered an important contextual source for adolescents' autonomy experiences and subsequent psychosocial adjustment. According to SDT, perceived parental autonomy-support is beneficial for adolescents' development because it is conducive to their psychological needs for autonomy, competence and relatedness (Soenens et al., 2018; Cordeiro, Paixão, & Lens, 2015). Therefore, the first aim of this study is to examine the relationship between perceived parental autonomy support with need satisfaction.

According to the SDT, there is a continuum of motivational orientations for activities ranging from extrinsic/controlled regulation (engagement out of coercion or for achieving a reward), to intrinsic/ autonomous motivation (engagement out of pleasure, interest and enjoyment). Research results are quite consistent in suggesting that the more autonomous the motivation is the higher the quality of engagement and the well-being of the student (Katz, Kaplan & Buzukashvily, 2011). A great deal of research has shown that parental autonomy support is related to higher intrinsic academic motivation and many other psychological and educational benefits associated with autonomous forms of motivation (Li, Deng, Wang & Tang, 2018; Froiland, 2010; Soenens & Vansteenkiste, 2005). Overall, in the light of these findings it is important to ask: "How do parents, as key significant others in the lives of adolescents influence their motivation? (Chew & Wang, 2010).

Several studies have shown that adolescents in a collectivistic culture experience more parental control than in individualistic cultures. More specifically, studies conducted with Eastern collectivistic cultures (Russia and China) indicated that adolescents perceived their parents as more controlling than U.S.A adolescents (Chirkov & Ryan, 2001, Vansteenkiste, Zhou, Lens & Soenens, 2005). In this study our comparison would be between Greek and Dutch students because we want to test the aforementioned findings between two European countries which are different in terms of cultural orientation. More specifically, we choose Greece because is considered as a more collectivist society than the Netherlands (Pouliasi & Verkuyten, 2010). Overall, this study aims to gain more insight into the micro-processes involved in the role of culture in autonomy-relevant parenting. Therefore we hypothesize that differences would emerge between countries that differ in cultural orientation with regard to perceived parental autonomy-support and in terms of academic motivation

(intrinsic versus extrinsic) and we estimate that these contextual differences would have an impact on adolescents' fulfillment of the basic psychological needs.

### 1.1 Types of motivation in SDT

SDT has been applied broadly in education to explain motivational development and academic functioning ( Taylor et al., 2014; Vansteenkiste, Lens & Deci, 2006). According to SDT theory, there is a continuum of motivational orientations for activities ranging from extrinsic/controlled regulation, to intrinsic/autonomous motivation (Katz, Kaplan & Buzukashvily, 2011). When experiencing autonomous motivation, people are generally self-determined and are willing to engage in certain behaviors. Intrinsic motivation involves the experience of volition and choice and is considered autonomous by nature (Li, Deng, Wang & Tang, 2018; Vansteenkiste, Lens & Deci, 2006)

In contrast to intrinsic motivation, the SDT distinguishes several types of extrinsic motivation which can vary greatly in the degree to which it is autonomous. Extrinsic motivation motivates behaviors deemed valuable by social regulations and refrains from behaviors deemed problematic albeit enjoyable. The least autonomous is *external regulation*. In this case, the behavior is prompted by external reasons, such as rewards and punishments and the reasons for performing the behavior are not internalized at all. A second type of extrinsic motivation is *introjected regulation*. Introjection describes a type of behavior in which people engage in an activity to comply with internal pressure, which is based either in the pursuit of self-aggrandizement and self-worth or in the avoidance of feelings of guilt and shame. *Identification* refers to the process of identifying with the value of an activity. Identification represents a fuller form of internalization that is characterized by an internal perceived locus of causality. Although still extrinsic in nature, identified regulation is relatively volitional and approximates intrinsic motivation (Li, Deng, Wang & Tang, 2018; Vansteenkiste, Lens & Deci, 2006).

## **1.2 Basic psychological needs**

Central to SDT is the satisfaction of three psychological needs: autonomy, competence and relatedness. In SDT these needs are considered universal nutrients that must be satisfied for effective functioning and well-being. When the need for autonomy is satisfied people act with a sense of volition and experience that their behavior is freely chosen and coherent with their values. When the need for autonomy is frustrated people experience a sense of pressure and coercion (Costa, Gugliandolo, Barberis, Cuzzocrea & Liga, 2018).

When the need of relatedness is satisfied, people feel connected to others who care for them. When frustrated, people have experiences of social alienation and loneliness. Finally, when the need for competence is satisfied, people feel effective and skillful in the activities they undertake. When frustrated, people feel inferior and inadequate in their daily activities (Costa, Soenens, Gugliandolo, Cuzzocrea & Larcen, 2014). Self-determination theory highlights the role of social contexts, which can either facilitate or undermine the satisfaction of the psychological needs. A great body of research has shown that need supportive parental behaviors ( e.g autonomy support) would facilitate satisfaction of basic psychological needs, while need thwarting parental behaviors (e.g, parental psychological control) would forestall satisfaction (Soenens & Vansteenkiste, 2010; Soenens et al., 2018).

## **1.3 Perceived parental autonomy support and need satisfaction**

As we mentioned before, according to Self-determination theory, human beings are endowed with innate tendencies that seek to satisfy the three basic psychological needs of autonomy, competence and relatedness. The social contexts play an important part in that it can either facilitate or impede the satisfaction of the psychological needs. Social contexts that enable the satisfaction of these needs are theorized to promote optimal health and well-being. In Self-determination theory parents are key significant others in the lives of adolescents and therefore play a critical role in the process by supporting autonomy and providing interpersonal involvement and warmth (Chew &Wang, 2010; Soenens et al., 2018). Therefore, one of the critical roles of parents is to facilitate the fulfillment of these needs (Costa, Gugliandolo, Barberis, Cuzzocrea & Liga, 2018; Chew &Wang, 2010).

Autonomy supportive parenting is one important dimension of a need-supportive parenting style. Autonomy-supportive parenting is defined as a parental style that fosters a sense of volition in children, for instance, taking the child's frame of reference, providing meaningful choices, encouraging initiative and providing a relevant rationale when introducing rules (Costa, Cuzzocrea, Gugliandolo & Larcan, 2015). In addition, autonomy-supportive parents try to display interest towards their child's feelings and thoughts, even when adolescents express negative emotions or display resistance against parental authority (Soenens et al., 2018).

In contrast to parental autonomy support, parental psychological control is a need thwarting parental behavior which forestalls the satisfaction of psychological needs. Psychologically controlling parents rely on intrusive and manipulating strategies such as guilt induction, disappointment, shaming, isolation, personal attacks and love withdrawal in order to make the child comply with their rules and expectations (Costa, Cuzzocrea, Gugliandolo & Larcan, 2015). Several studies have found that need frustration was strongly associated with psychological control (Soenens & Vansteenkiste, 2010; Costa, Soenens, Gugliandolo, Cuzzocrea & Larcan, 2014).

In contrast to psychological control, several researchers have found that higher satisfaction of the basic psychological needs is derived from parents who were perceived to be autonomy supportive, more involved and warm (Cordeiro, Paixão, & Lens, 2015; Inguglia et al., 2015). Furthermore, it has been shown that autonomy supportive parenting is a strong predictor of adolescents' well-being, social adjustment and achievement (Soenens et al., 2018). Overall, the research based on SDT has constantly demonstrated that parental autonomy support promotes growth, intrinsic motivation and psychological well-being via the experience of need satisfaction, whereas parental psychological control relates to maladjustment, ill-being and psychopathology through the experience of need frustration (Cordeiro, Paixão, & Lens, 2015).

#### **1.4 Perceived parental autonomy support and academic motivation**

Self-Determination theory has also been applied to educational settings. As we mentioned in the previous section, SDT highlights the role of parents, who either facilitate or undermine children's intrinsic motivation and internalization. Both intrinsic motivation and internalization are likely to function optimally when children's need for autonomy is supported. Thus, parents have a great impact on fostering adolescents' intrinsic academic motivation.

Academic motivation is a cognitive form which is linked to students' persistence. It is the degree to which students feel invested in academic pursuits and their willingness to take part in learning. Students who feel academically motivated are more likely to attend university by choice and to derive pleasure and satisfaction from their involvement in educational activities (Pedersen, 2017). A great body of research on students' academic motivation has converged on the finding that children who are intrinsically motivated to learn appreciate learning opportunities and find learning meaningful or relevant to meeting psychological needs such as gaining competence, seeing the beauty in knowledge, achieve higher grades and manifest higher well-being. In contrast, children who are extrinsically motivated may study in order to please others, to avoid feeling incapable or avoid punishments (Froiland, 2010; Katz, Kaplan & Buzukashvily, 2011).

Studies of parental influences are relatively few compared with those of teachers. Parental autonomy support is a key component in elevating children's intrinsic motivation to learn. Empirical evidence repeatedly shows that socialized practices derived from parental autonomy support are related to higher intrinsic academic motivation and many other psychological and educational benefits associated with autonomous forms of motivation (Li, Deng, Wang & Tang, 2018; Froiland, 2010; Soenens & Vansteenkiste, 2005).



### **1.5 Autonomy supportive parenting considering through a cross cultural lens- Greece versus Netherlands.**

As the field of cross-cultural psychology has burgeoned, there has been an increased awareness that many concepts central to western psychology may not be applicable within other cultures. In particular, there have been many debates concerning the cross-cultural relevance of autonomy. Several cross-cultural studies have argued that the experience of autonomy is less congruent with eastern cultures that embrace collectivist values and have an interdependent view of self. This stands in contrast with the SDT point of view that autonomy is a basic psychological need, the satisfaction of which is essential across cultures (Zhou, Ma & Deci, 2009; Rothbaum & Trommsdorff, 2007).

As we mentioned above, several studies have indicated that parents play a significant role fostering their children's need for autonomy, which is significantly linked to intrinsic motivation and need satisfaction (Cordeiro, Paixaõ, & Lens, 2015; Inguglia et al., 2015). Research increasingly demonstrates that associations between autonomy parenting and adolescents' need satisfaction and intrinsic motivation generalize across cultures. In particular, some cross-cultural scholars have raised doubts about whether the effects of parental autonomy support are indeed universal and also play an adaptive role in the development of adolescents raised in a collectivistic cultural setting. Autonomy supportive parenting may seem to be particularly at odds with collectivism, which entails hierarchical parent-child relationships and parental dominance (Soenens et al., 2018). Hence, the aim of this study is to gain more insight into the micro-processes involved in the role of culture in autonomy-parenting.

Culture holds a significant impact on adolescents' perceptions and interpretation of parental behavior, in terms of being perceived as autonomy supportive or more controlling. Several cross-cultural studies have indicated the cultural differences between individualistic and collectivistic cultures in terms of perceive parental autonomy support. In particular, the study of Lokes, Gingras, Philippe et al., (2009) with North American and Chinese adolescents showed that North American adolescents perceived their parents as being more autonomy – supportive than the Chinese adolescents. Furthermore, previously researchers have

shown that youth in the United States tend to rate their parents as more autonomy supportive compared to youth in Russia (which is considered a traditionally collectivistic and authoritarian country compared to USA) who perceived their parents as more controlling (Chirkov & Ryan, 2001).

In this study our comparison will be between Greek and Dutch students. Greece and Netherlands were chosen for this study due to their cultural and contextual differences in terms of collectivism and individualism. Greece is regarded as a more collectivist society than the Netherlands (Pouliasi & Verkuyten, 2010). Hence, on the light of the above mentioned findings and given the backdrop of strong cultural influence on adolescents appraisals of parental behavior that is, in their perceptions of parents as being autonomy-supportive or more controlling, we hypothesize that differences between perceived parental autonomy support, needs satisfaction and intrinsic academic motivation will emerge within our sample, in terms of cultural and contextual differences.

## Method

### Participants

The sample is consisted in total of 129 participants aged 16-18 years old. There were on average 17,27 years old ( $SD=0,70$ ). From our total sample boys hold the 30,23% and girls the 70%. The majority of the participants are born in big cities (68,22%). Most of the adolescents parents was born in big cities (fathers= 47,29%, mothers=44,19%). Most adolescent's parents had medium SES-average salary (fathers=51 %, mothers=54%)

Of the whole sample, 107 were Greek adolescents. There were on average 17, 27 years old (  $SD= 0,70$ ). Most Greek adolescents were female (71%) and boys (29%). The majority of the Greek sample was born in Athens ( 68,22%). The majority of parents was born in Athens also (fathers=44%, mothers=44,19%). The majority of Greek adolescent's parents are well educated (reported University studies the 36,43% for both mothers and fathers). Most Greek adolescents' parents had medium SES-average salary (fathers=51%, mothers=54,26%).

Dutch participants were 22 (14 females, 6 males) in total. There were on average 17,41 years old (  $SD= 0,67$ ). The majority of the participants were born in small cities (Leiden, Delft= 59%). Also the majority of their parents were born in small cities (Leiden, Delft= 59%). Most Dutch adolescents' parents were well educated (fahers\_HBO=22,73%, mothers\_HBO =45,50%). Most Dutch parents had medium SES-average salary ( 45%).

### Procedure

The data collection took place through social media for both samples. We created two distinct questionnaires in Google forms, one for the Dutch students and one for the Greek students. Because the adolescents were age 16 or older, no explicit permission was obtained through informed consents from parents. All questionnaires were provided in English for both samples. Furthermore, it was made clear to adolescents that their participation was voluntary and that they could withdraw any time. Students were also told that their data would be treated confidentially. The procedure completing the questionnaires took approximately 15 minutes.

### Demographic variables

Participants also provided data about their parent's educational attainment, job status, birth place and education level.

### Measures

**Perceptions of parents scale:** The students' perception of parental-autonomy support, involvement and warmth are measured using the Perception of Parents Scale developed by Robbins (1994). The scale is a self-report questionnaire consisting of 42 items: 21 for mothers and 21 for fathers, that are rated on 7-point Likert scale (1 = *not at all true*; 7 = *very true*). The reliability coefficient for perceptions of maternal autonomy-support, ( $\alpha = .82$ ) and for perceptions of paternal autonomy-support, ( $\alpha = .81$ ) were satisfactory (Chew & Wang, 2008). We excluded the subscales maternal and paternal warmth and involvement and used only the subscales for autonomy support. Cronbach's alpha for the maternal autonomy support was .83 and for paternal autonomy support was .84 indicating good reliability.

### Academic Motivation

The *Self-Regulation Questionnaire-Academic Domain* (SRQ-A; Ryan&Connell, 1989) is used to test the academic motivation among pupils and students' reason for doing school work along a dimension from little or no volition to very high volition. The SRQ- A consists of 32 questions, each question was rated on 4-point Likert scale as being 1=very true, 2= sort of true, 3=not very true and 4= not at all true. Specifically, the SRQ- A assesses four types of reasons for academic work: external regulation ( e.g "*Because I would get in trouble if I don't*"), introjected regulation ( e.g "*Because I would be ashamed of myself if I didn't*"), identified regulation ( e.g "*Because I think school work is important*") and intrinsic motivation (e.g "*Because it is interesting to me*"). Internal consistency estimates for each category ranged from  $\alpha = .62$  to  $\alpha = .82$ , indicating moderate to high levels of internal consistency. For this study the Cronbach's alpha for each category ranged from  $\alpha = .70$  to  $\alpha = .83$  indicating satisfactory levels of internal consistency.

### **Basic psychological need satisfaction and frustration scale**

*The basic psychological need satisfaction and frustration scale* (Chen et al., 2015) is a self-report questionnaire is used to assess both the satisfaction and frustration of the psychological needs for autonomy, competence and relatedness. It consists of 24 items , which are measured in a 5point-likert scale from 1=not true at all to 5=completely true. For example, the satisfaction of autonomy is measured by the question “ *I feel a sense of choice and freedom in the things I undertake*” and the frustration of autonomy by the item: “*Most of the things I do feel like I have to do*”. The satisfaction of relatedness is assessed by the item: “ *I feel the people I care about also care about me*” and the frustration by the item: “*I feel excluded from the group I want to belong*”. Lastly, satisfaction of competence is assessed by the item: “*I feel confident that I can do things well*” and frustration by the item: “*I have serious doubts about whether I can do things well*”. In this study we didn't include the frustration subscales in our statistical analysis, only the satisfaction subscales. The internal consistency is good, ranging between  $\alpha = 0.70$  to  $\alpha = 0.77$ .

### **Individualism and Collectivism Scale**

*The Individualism and Collectivism scale* (Triandis & Gelfand, 1998) is a self-report questionnaire consisting of 16 items which is designed to measure four dimensions of collectivism and individualism (Vertical Collectivism, Vertical Individualism, Horizontal Collectivism, Horizontal Individualism). All items are answered on a 9-point scale (1= never or definitely no and 9 = always or definitely yes). For example, Horizontal individualism (seeing the self as fully autonomous and believing that the equality between individuals is the ideal) is measured by the question “ *I would rather depend on myself than others*”. An example of item concerning the measurement of Vertical Individualism (seeing the self as fully autonomous but recognizing that inequality will exist among individuals and that accepting this inequality) is “ *It is important that I do my job better than the others*”. Horizontal Collectivism (seeing the self as part of a collective but perceiving all the members of that collective as equal) one question is “ *To me, pleasure is spending time with friends*” and the last dimension of Vertical Collectivism (seeing the self as a part of a collective and being willing to accept hierarchy and inequality within that collective) is assessed for example with the question “ *Parents and children must stay*

*together as much as possible*". The internal consistency is satisfactory, ranging from  $\alpha=.63$  to  $\alpha=.74$ .

## Results

### Descriptive statistics

**Chi square:** The matching process of the two samples was accomplished by selecting 22 Greek participants from the 107 in total who had the similar demographics characteristics to the 22 Dutch participants. This process led to the complete identification of the two samples in terms of gender, age as well as in terms of the educational and job status of the parents. Chi square analysis was used in order to investigate differences between the 22 selected Greeks and the 22 Dutch participants. The analysis indicated that only the financial level of the fathers' was statistically significant (see appendix).

### Reliability Analysis

In table 1 the Cronbach's alpha index is been presented for all the scales of the questionnaires used in this study. As it can be seen the majority of the values are above the value .7. This indicates a satisfactory level of internal consistency. Also, some of the values between .6 and .7 are considered acceptable.

Table 1

#### *Reliability Analysis*

	Cronbach's alpha (n = 129, Dutch & Greek)	Cronbach's alpha (n = 107, Greek)	Cronbach's alpha (n = 22, Dutch)
Mother Autonomy Support	.83	.83	.84
Father Autonomy Support	.84	.83	.92
Autonomy satisfaction	.70	.66	.88

Autonomy frustration	.77	.75	.84
Relatedness satisfaction	.77	.77	.81
Relatedness frustration	.68	.66	.77
Competence satisfaction	.73	.71	.86
Competence frustration	.81	.87	.81
<b>SQR Questionnaire</b>	.83	.83	.80
External Regulation	.76	.77	.76
Introjected Regulation	.70	.71	.41
Identified Regulation	.74	.74	.67
Intrinsic Motivation	.83	.85	.74
<b>COS Questionnaire</b>	.75	.73	.78
Horizontal individualism	.63	.58	.82
Vertical individualism	.74	.71	.85
Horizontal collectivism	.69	.69	.73
Vertical collectivism	.63	.61	.61

## ANOVA

One-way analysis of variance (ANOVA) were conducted to examine whether significant differences existed between Greek and Dutch students in ratings of parental autonomy support, intrinsic motivation, need satisfaction and collectivism-individualism. The tables 2 and 3 it can be observed that Greek participants ( $N = 107$ ) exhibit higher level of vertical collectivism towards Dutch participants ( $M_G = 2.83$ ,  $SD_G = .51$  vs  $M_D = 2.52$ ,  $SD_D = .35$ ). The same result was true for the matched Greek sample against the Dutch sample ( $M_G = 2.85$ ,  $SD_G = .43$  vs  $M_D = 2.52$ ,  $SD_D = .35$ ). Furthermore, Greek participants ( $N = 107$ ) exhibited higher level of introjected Regulation towards Dutch participants ( $M_G = 27.09$ ,  $SD_G = 5.14$  vs  $M_D = 23.18$ ,  $SD_D = 4.86$ ). The same result was true for the matched Greek sample against the Dutch sample ( $M_G = 27.36$ ,  $SD_G = 5.59$  vs  $M_D = 23.18$ ,  $SD_D = 4.86$ ). In addition, Greek participants ( $N = 22$ ) exhibited higher level of identified regulation ( $M_G = 3.40$ ,  $SD_G = .43$  vs  $M_D = 3.06$ ,  $SD_D = .43$ ), intrinsic motivation ( $M_G = 2.74$ ,  $SD_G = .56$  vs  $M_D$

= 2.40,  $SD_D = .55$ ) and horizontal collectivism ( $M_G = 30.77$ ,  $SD_G = 3.01$  vs  $M_D = 28.05$ ,  $SD_D = 4.76$ ) towards Dutch participants.

Table 2

*Mean values and standard deviations for the Greek and Dutch sample*

	Whole sample (N=129)		Greek (N=107) (1)		Dutch (N=22) (2)		Greek matched (N=22) (3)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1 Maternal autonomy support	5.28	.95	5.23	.97	5.54	.78	5.33	.97
2 Paternal autonomy support	5.03	1.13	5.00	1.11	5.20	1.23	5.01	1.30
3 External regulation	2.46	.58	2.48	.59	2.39	.53	2.43	.67
4 Introjected regulation	2.78	.50	2.83	.51	2.52	.35	2.85	.43
5 Identified regulation	3.22	.51	3.25	.52	3.06	.43	3.40	.43
6 Intrinsic motivation	2.50	.64	2.52	.66	2.40	.55	2.74	.56
7 Autonomy satisfaction	3.83	.75	3.85	.73	3.70	.84	3.86	.88
8 Relatedness satisfaction	4.28	.61	4.30	.61	4.23	.62	4.42	.47
9 Competence satisfaction	3.82	.75	3.80	.76	3.88	.69	3.91	.70
10 Horizontal individualism	27.28	5.43	27.39	5.28	26.73	6.20	28.59	5.43
11 Vertical individualism	21.20	6.55	21.70	6.20	18.77	7.75	20.95	6.67
12 Horizontal collectivism	28.80	4.47	28.95	4.41	28.05	4.76	30.77	3.01
13 Vertical collectivism	26.43	5.28	27.09	5.14	23.18	4.86	27.36	5.59

Note: numbers 1, 2 and 3 represent samples 1 (Greek, N = 127), 2 (Dutch, N = 22) and 3 (Matched Greek, N = 22)



Table 3

*One Way Anova for the differences on parental support, collective orientation, need satisfaction and self-regulation between the Greek and Dutch sample*

	Comparison 1 with 2	Comparison 2 with 3
1	$F(1, 126) = 1.92, p = .168, \eta^2 = .015, power = .280$	$F(1, 41) = .60, p = .443, \eta^2 = .014, power = .118$
2	$F(1, 125) = .52, p = .468, \eta^2 = .004, power = .112$	$F(1, 41) = .23, p = .629, \eta^2 = .006, power = .076$
3	$F(1, 127) = .37, p = .543, \eta^2 = .003, power = .093$	$F(1, 42) = .03, p = .848, \eta^2 = .001, power = .054$
4	<b><math>F(1, 127) = 7.55, p = .007, \eta^2 = .056, power = .778^{**}</math></b>	<b><math>F(1, 42) = 7.91, p = .007, \eta^2 = .159, power = .785^{**}</math></b>
5	$F(1, 127) = 2.39, p = .124, \eta^2 = .018, power = .336$	<b><math>F(1, 42) = 6.88, p = .012, \eta^2 = .141, power = .727^*</math></b>
6	$F(1, 127) = .592, p = .443, \eta^2 = .005, power = .119$	<b><math>F(1, 42) = 4.13, p = .048, \eta^2 = .090, power = .511^*</math></b>
7	$F(1, 127) = .708, p = .402, \eta^2 = .006, power = .133$	$F(1, 42) = .37, p = .544, \eta^2 = .009, power = .092$
8	$F(1, 127) = .23, p = .630, \eta^2 = .002, power = .077$	$F(1, 42) = 1.34, p = .252, \eta^2 = .031, power = .206$
9	$F(1, 127) = .16, p = .685, \eta^2 = .001, power = .069$	$F(1, 42) = .02, p = .872, \eta^2 = .001, power = .053$
10	$F(1, 127) = .27, p = .602, \eta^2 = .002, power = .081$	$F(1, 42) = 1.12, p = .295, \eta^2 = .026, power = .179$
11	$F(1, 127) = 3.72, p = .056, \eta^2 = .029, power = .483$	$F(1, 42) = 1.00, p = .322, \eta^2 = .023, power = .165$
12	$F(1, 127) = .752, p = .387, \eta^2 = .006, power = .138$	<b><math>F(1, 42) = 5.16, p = .028, \eta^2 = .110, power = .603^*</math></b>
13	<b><math>F(1, 127) = 10.77, p = .001, \eta^2 = .078, power = .903^{**}</math></b>	<b><math>F(1, 42) = 7.01, p = .011, \eta^2 = .143, power = .735^*</math></b>

Note: numbers 1, 2 and 3 represent samples 1 (Greek, N = 127), 2 (Dutch, N = 22) and 3 (Matched Greek, N = 22), \* p <.05,

\*\*p<.0

### Hierarchical Regression analysis

**Parental autonomy support-need satisfaction:** A hierarchical regression analysis was conducted in order to examine whether parental autonomy support (separately for maternal and paternal) predicts need satisfaction. In table 4 a regression model with autonomy satisfaction as the dependent variable and as independent variables the maternal autonomy support, the paternal autonomy support and the culture. In model 1, in which is depicted the comparison between the 107 Greek students and 22 Dutch students, only the maternal autonomy support is statistical significant ( $\beta = .199, p = .031$ ) which means that it has a positive effect on the autonomy satisfaction for both Greek and Dutch students. Model 2, in which is depicted the comparison between the 22 Greeks (matched) with the 22 Dutch students is not statistical significant. In the regression model 1 with relatedness satisfaction as dependent variable it can be seen that maternal autonomy support ( $\beta = .171, p = .058$ ) and paternal autonomy support ( $\beta = .171, p = .058$ ) are marginal statistical significant predictors of relatedness satisfaction. In model 2 maternal autonomy support ( $\beta = .307, p = .054$ ) is a marginal statistical significant predictor of relatedness satisfaction.

In the regression model with competence as dependent variable there was not a significant predictor.

Table 4

*Hierarchical Linear Regression Coefficients (Need satisfaction)*

	Model I: Greek, N = 107, Dutch, N= 22				Model II: Greek, N = 22, Dutch, N= 22			
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>T</i>	<i>p</i> ( $\beta$ )
Autonomy satisfaction								
<b>First step</b>								
Constant	3.819	.074	51.511	.000	3.655	.183	19.946	.000
Culture	.077	.170	.455	.650	.274	.259	1.057	.297
<b>Second step</b>								
Constant	2.797	.426	6.564	.000	2.353	.933	2.522	.016
Culture	.075	.167	.450	.653	.312	.258	1.208	.235
Mother Autonomy Support	.157	.072	2.180	<b>.031*</b>	.259	.152	1.706	.096
Father Autonomy Support	.039	.060	.645	.520	-.024	.104	-.227	.822
F(3, 122) = 2.17, <i>p</i> = .094, <i>R</i> <sup>2</sup> = .051				F(3, 38) = 1.35, <i>p</i> = .272, <i>R</i> <sup>2</sup> = .096				
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>T</i>	<i>p</i> ( $\beta$ )
Relatedness satisfaction								
<b>First step</b>								
Constant	4.265	.060	70.518	.000	4.274	.118	36.367	.000
Culture	.173	.139	1.247	.215	.167	.166	1.003	.322
<b>Second step</b>								
Constant	3.215	.343	9.378	.000	3.142	.589	5.339	.000
Culture	.173	.134	1.284	.201	.201	.163	1.237	.224
Mother Autonomy Support	.111	.058	1.914	<b>.058</b>	.190	.096	1.987	<b>.054</b>
Father Autonomy Support	.092	.048	1.912	<b>.058</b>	.016	.065	.251	.803
F(3, 122) = 3.83, <i>p</i> = .011, <i>R</i> <sup>2</sup> = .086				F(3, 38) = 1.78, <i>p</i> = .166, <i>R</i> <sup>2</sup> = .124				
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>T</i>	<i>p</i> ( $\beta$ )
Competence satisfaction								
<b>First step</b>								
Constant	3.784	.074	51.315	.000	3.845	.148	25.931	.000
Culture	.153	.169	.907	.366	.119	.210	.568	.573
<b>Second step</b>								

Constant	2.654	.422	6.293	.000	2.955	.770	3.839	.000
Culture	.153	.165	.926	.356	.148	.213	.695	.491
Mother Autonomy Support	.116	.071	1.627	.106	.119	.125	.946	.350
Father Autonomy Support	.103	.059	1.738	.085	.046	.086	.538	.594
F(3, 122) = 2.83, p = .065, R <sup>2</sup> = .051					F(3, 38) = .570, p = .638, R <sup>2</sup> = .043			

Note: \* p < .05, \*\* p < .01

**Parental autonomy support- Academic motivation:** A hierarchical regression analysis was conducted in order to examine whether parental autonomy support (separately for maternal and paternal) predicts intrinsic academic motivation. In table 5 it can be observed a regression model with dependent variable the intrinsic motivation and independent variables the maternal autonomy support, the paternal autonomy support and the culture. In model 1 and 2 only culture is explain significant ( $\beta = .189$ ,  $p = .035$  for model 1 and  $\beta = .395$ ,  $p = .010$ ) which means that Greek students exhibit higher level of intrinsic motivation than Dutch students. As far as, the regression model with identified regulation as the dependent variable, it can be seen that only culture is significant predictor ( $\beta = .178$ ,  $p = .046$  for model 1 and  $\beta = .360$ ,  $p = .022$  for model 2) which means that Greek students exhibit higher level of identified motivation than Dutch students. In regression model 2 as the dependent variable introjected regulation it can be seen that culture is significant predictor ( $\beta = .401$ ,  $p = .005$ ) which means that Greek students exhibit higher level of introjected motivation. Also, in model 2 it can be seen that the paternal autonomy support is significant ( $\beta = -.358$ ,  $p = .012$ ) which means that the paternal autonomy support has a negative effect on introjected regulation. In regression model with external regulation as the dependent variable only paternal autonomy support ( $\beta = -.346$ ,  $p = .031$ ) is a significant predictor.

Table 5

*Hierarchical Linear Regression Coefficients (self-regulation)*

	Model I: Greek, N = 107, Dutch, N= 22				Model II: Greek, N = 22, Dutch, N= 22			
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>T</i>	<i>p</i> ( $\beta$ )
<b>Intrinsic Motivation</b>								
<b>First step</b>								
Constant	2.437	.062	39.115	.000	2.347	.113	20.755	.000
Culture	.307	.143	2.151	<b>.033*</b>	.429	.160	2.680	.011
<b>Second step</b>								
Constant	2.499	.365	6.847	.000	2.068	.580	3.566	.001
Culture	.305	.143	2.133	<b>.035*</b>	.433	.160	2.704	<b>.010*</b>
Mother Autonomy Support	.044	.062	.710	.479	.117	.094	1.241	.222
Father Autonomy Support	-.058	.051	-1.131	.260	-.070	.064	-1.089	.283
F(3, 122) = 2.02, <i>p</i> = .114, <i>R</i> <sup>2</sup> = .023				F(3, 38) = 3.19, <i>p</i> = .034, <i>R</i> <sup>2</sup> = .201				
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>T</i>	<i>p</i> ( $\beta$ )
<b>Identified Regulation</b>								
<b>First step</b>								
Constant	3.172	.050	62.987	.000	3.061	.095	32.098	.000
Culture	.232	.115	2.015	<b>.046*</b>	.340	.135	2.522	<b>.016*</b>
<b>Second step</b>								
Constant	2.732	.294	9.293	.000	3.355	.501	6.690	.000
Culture	.232	.115	2.016	<b>.046*</b>	.331	.139	2.388	<b>.022</b>
Mother Autonomy Support	.048	.050	.957	.340	-.046	.082	-.567	.574
Father Autonomy Support	.038	.041	.908	.365	-.008	.056	-.136	.893
F(3, 122) = 2.13, <i>p</i> = .099, <i>R</i> <sup>2</sup> = .050				F(3, 38) = 2.15, <i>p</i> = .034, <i>R</i> <sup>2</sup> = .146				
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>T</i>	<i>p</i> ( $\beta$ )
<b>Introjected Regulation</b>								
<b>First step</b>								
Constant	2.761	.050	55.527	.000	2.497	.085	29.295	.000
Culture	.049	.114	.428	.670	.339	.121	2.809	<b>.008**</b>
<b>Second step</b>								
Constant	2.994	.292	10.246	.000	2.454	.405	6.054	.000
Culture	.048	.115	.423	.673	.334	.112	2.982	<b>.005**</b>
Mother Autonomy Support	-.017	.049	-.340	.734	.120	.066	1.823	.076
Father Autonomy Support	-.029	.041	-.693	.490	-.119	.045	-2.637	<b>.012*</b>
F(3, 122) = .317, <i>p</i> = .813, <i>R</i> <sup>2</sup> =				F(3, 38) = 6.06, <i>p</i> = .002, <i>R</i> <sup>2</sup> =				

	.008				.324			
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>T</i>	<i>p</i> ( $\beta$ )
	External Regulation							
<b>First step</b>								
Constant	2.456	.057	42.991	.000	2.370	.134	17.750	.000
Culture	-.044	.131	-.339	.735	.037	.189	.196	.846
<b>Second step</b>								
Constant	3.041	.332	9.159	.000	3.060	.663	4.614	.000
Culture	-.043	.130	-.331	.742	.008	.183	.046	.963
Mother Autonomy Support	-.095	.056	-1.698	.092	.030	.108	.281	.780
Father Autonomy Support	-.016	.047	-.348	.728	-.165	.074	-2.234	<b>.031*</b>
	F(3, 122) = 1.22, $p = .305$ , $R^2 = .029$				F(3, 38) = 1.68, $p = .187$ , $R^2 = .117$			

Note: \*  $p < .05$ , \*\*  $p < .01$

**Parental autonomy support-Collectivism/Individualism:** A hierarchical regression analysis was conducted in order to examine whether parental autonomy support (separately for maternal and paternal) is predicted by Individualism-Collectivism. In table 6 two regression models can be observed, the maternal autonomy support and the second with the paternal autonomy support as the dependent variables. In both models the independent variables are the following: culture, horizontal collectivism, vertical collectivism, horizontal individualism and vertical individualism. Furthermore, in both models only the vertical collectivism was significant predictor ( $\beta = .280$ ,  $p = .003$ ,  $\beta = .243$ ,  $p = .015$ ). This means that when there is an increase on vertical collectivism there is an increase in maternal and paternal autonomy support also.

Table 6

*Hierarchical Linear Regression Coefficients (Collectivism)*

	Model I: Greek, N = 107, Dutch, N= 22				Model II: Greek, N = 22, Dutch, N= 22			
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )
<b>Mother Autonomy Support</b>								
<b>First step</b>								
Constant	5.279	.093	56.641	.000	5.535	.187	29.593	.000
Culture	.012	.215	.057	.955	-.207	.268	-.775	.443
<b>Second step</b>								
Constant	3.012	.631	4.775	.000	4.734	1.264	3.746	.001
Culture	-.119	.208	-.575	.566	-.339	.320	-1.059	.297
Horizontal individualism	.008	.017	.446	.657	-.033	.031	-1.076	.289
Vertical individualism	-.003	.013	-.263	.793	.005	.020	.247	.807
Horizontal collectivism	.029	.020	1.433	.155	.037	.037	.991	.328
Vertical collectivism	.050	.017	3.009	<b>.003**</b>	.024	.030	.803	.427
F(5, 121) = 3.85, <i>p</i> = .003, <i>R</i> <sup>2</sup> = .136				F(5, 37) = .461, <i>p</i> = .802, <i>R</i> <sup>2</sup> = .059				
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i> ( $\beta$ )
<b>Father Autonomy Support</b>								
<b>First step</b>								
Constant	5.035	.112	44.782	.000	5.198	.277	18.777	.000
Culture	-.006	.253	-.025	.980	-.188	.387	-.487	.629
<b>Second step</b>								
Constant	4.133	.782	5.288	.000	6.243	1.846	3.381	.002
Culture	-.052	.253	-.203	.839	-.141	.468	-.300	.766
Horizontal individualism	-.016	.021	-.763	.447	-.032	.041	-.779	.441
Vertical individualism	-.015	.016	-.920	.360	-.020	.031	-.650	.520
Horizontal collectivism	.009	.026	.357	.721	-.029	.056	-.511	.612
Vertical collectivism	.053	.021	2.474	<b>.015*</b>	.041	.043	.956	.345
F(5, 121) = 1.69, <i>p</i> = .142, <i>R</i> <sup>2</sup> = .065				F(5, 37) = .511, <i>p</i> = .766, <i>R</i> <sup>2</sup> = .065				

## Discussion

The current study was an initial research attempt to investigate the impact of cultural diversity (Collectivism-Individualism) between two European countries (Greece- Netherlands) on adolescents' perceived parental autonomy support, need satisfaction and academic motivation. More specifically, we examined whether 1) separately perceived maternal-paternal autonomy support (would predict need satisfaction and intrinsic academic motivation in both samples and whether 2) cultural differences based on individualistic and collectivistic orientations would indicate differences between our groups with regard to perceived parental autonomy-support and in terms of academic motivation (intrinsic versus extrinsic) and finally, 3) we tested whether these contextual differences would have an impact on adolescents' fulfillment of the basic psychological needs.

Contrary to our hypothesis, mean comparisons, didn't confirm the expected lower levels of autonomy parental support, intrinsic academic motivation and need satisfaction in Greek participants. To the contrary, the Greek participants reported higher autonomous types of motivation (intrinsic and identification) in comparison to Dutch participants. In support of our hypothesis Greek participants scored higher on vertical and horizontal collectivism, which indicated that Greek students are more collectivisticly oriented than the Dutch participants.

These findings are in line with previous research with participants from USA and Russia, which indicated that Russian participants despite their collectivistic orientation reported more intrinsic motivation for school than the participants from the USA (Chirkov & Ryan, 2001). Similarly, whereas some cross-cultural scholars equate autonomy with individualism, the SDT suggests that one can be autonomously collectivistic or autonomously individualistic. One who truly endorses collectivistic values could be highly autonomous when acting in accordance with them. In others words, both close relationships and autonomy are essential nutrients for self-determined goal directed behaviors in both individualistic and collectivistic cultures (Deci & Ryan, 2000).

Despite these unexpected mean-level differences, perceived parental autonomy support did not predict adolescents' satisfaction for competence and relatedness and intrinsic academic motivation as predicted by SDT and previous studies (Cordeiro, Paixão, & Lens, 2015; Hong Jiang, Yau, Bonner & Chiang, 2017). Only maternal autonomy support predicted adolescents' autonomy satisfaction for both samples. Thus, our first hypothesis is partially accepted. This echoes the proposal of the SDT that the need for autonomy is universal and its satisfaction is essential to individual's optimal functioning across cultures (Deci & Ryan, 2000). This finding is also consistent with previous studies exploring the role of parental autonomy support in Chinese and Russian adolescents' need satisfaction and well-being (Wang, Pomerantz & Chen, 2007; Chirkov & Ryan).

One possible explanation for these findings could be that adolescents could perceive mothers as more involved in parenting rearing practices, while fathers could use other types of parental practices to support or thwart the adolescents' basic psychological needs (Skinner, Johnson & Snyder, 2005; Costa, Gugliandolo, Barberis, Cuzzocrea & Liga, 2018). Another explanation for this finding could be that parents may not have strong effects in middle adolescence. Adolescence is typically marked as a time during which children develop conceptualizations of the self as an autonomous, efficacious individual accompanied by a shift in child-parent relationship that includes more conflict and renegotiations of authority (Soenens et al., 2007; Vasquez, Patall, Fong, Corrigan & Pine, 2015). Accordingly, effects of autonomy supportive parenting on adolescents' need satisfaction may decrease over time. Furthermore, we should take into consideration that maybe during that age peer relationships hold a more significant role on adolescents' sense of relatedness (Soenens et al., 2007). Future research is needed to shed some light on how the relationships between parental autonomy support and adolescents' need satisfaction change across developmental levels.

Contrary to the initial expectations, parental autonomy support didn't predict adolescents' intrinsic academic motivation. An interesting finding which is in line with our expectations is that parental autonomy support was negatively related to adolescents' external regulation and introjected regulation. These results indicate that paternal autonomy support prevents adolescents from being externally and introjected regulated, which are the least autonomous types of motivations. One possible



explanation to this finding could be that mothers hold a more protective and caring role whereas fathers usually seems to enhance adolescents' assertiveness by encouraging them not to be afraid to challenge themselves and act with accord with their interests, which is considered a more autonomous and self-determined behavior. Clearly, this issue requires further scrutiny and future research should shed some light on the differentiating role that parents hold on adolescents' need satisfaction and intrinsic motivation.

The finding about the non-significant association between parental autonomy support and intrinsic academic motivation is contrary to previous studies which have demonstrated that parental autonomy support is a predictor of intrinsic academic motivation and school achievement (Vasquez, Patall, Fong, Corrigan & Pine, 2015). One explanation for this finding could be attributed to the differentiated roles of teachers and parents in the daily lives of high-school students. High-school students spend much of their time studying in school where they interact with teachers and peers. That is, teachers become a more essential social figure in learning-related events (Li, Deng, Wang & Tang, 2018). Thus, when it comes to developing a value for school teachers appear to affect student's experiences in the academic domain more than parents (Chirkov & Ryan, 2001).

Contrary to our expectations, not individualism but vertical collectivism predicted both maternal and paternal autonomy support. This finding is inconsistent with previous findings which have indicated that adolescents who are raised in more collectivistic cultural settings perceive more psychological control than adolescents who are raised in more individualistic oriented societies (Chirkov & Ryan, 2001; Lokes, Gingras, Philippe, Koestner & Fang, 2009). In this sense, the concept of autonomy is perhaps a psychological variable worth studying in diverse nations and cultures and may be less culturally delimited than many authors have assumed (Deci & Ryan, 2000).

### **Strengths, Limitations and Future Directions**

Several strengths of the study are worth mentioning. First, this study is an initial attempt to conceptualize the differences between two European countries on parental autonomy support, need satisfaction and intrinsic academic motivation on the basis of their cultural differences (Collectivism-Individualism). The majority of previous studies have focused on cultural differences between U.S.A , China and Russia. A second strength to acknowledge could be that we tried to investigate the predictive power of parental autonomy support on adolescents' intrinsic academic motivation. The research investigating this association is scarce. On the contrary, teachers' effect on adolescents' academic motivation and school achievement is well established and studied. Lastly, a third strength to take into consideration is that we tested the predictive power of maternal and paternal autonomy support on adolescents' need satisfaction and academic motivation independently. This provides us with a broader scope of parents' differentiating roles and their relative effects on their children's need satisfaction and academic motivation.

Several limitations of the current study should be acknowledged. Firstly, the sample of this study was considerably small. The small sample size puts limitations on the statistical power of the analysis and poses risks for the reliability of the findings. A second limitation that should be addressed is that our samples was fairly homogeneous and consisted mostly of girls (Mage=17,27 years) from families with medium SES. Future research needs to rely on larger and more heterogeneous sample to explore the generalizability of our findings. Longitudinal data would help, additionally, in clarifying causal pathways.

A third important limitation of this study is that we didn't translate the questionnaires in the language of origin for both countries instead we administered the questionnaires in English, which entails the risk of biased interpretation of the questions. This also affects the reliability of our findings. Finally, because only two cultures are compared, generalization to other cultural groups is not justified. Thus, this study represents a pilot study that tried to address the expression of perceived parental autonomy support in other cultures and its functional effects on need satisfaction and intrinsic academic motivation.

Future studies could also include and examine parent-adolescent discrepancies on parental autonomy support and the reciprocal associations with need satisfaction and intrinsic motivation. Another, interesting avenue for future research may be to develop and test parent training programs based on SDT. Research on SDT has advanced sufficiently so that it should be possible to design parent training programs that inform parents explicitly about ways to implement an autonomy supportive style in parent-child interactions (Joussemet, Landry & Koestner, 2008).

### **Practical importance**

Our findings support previous findings. More specifically, our results show that when mothers were perceived as adopting an autonomy-supportive interpersonal style, feelings of autonomy satisfaction were likely to occur. Although the effect sizes are not robust the findings are interesting. From an applied perspective, our data suggested that parental prevention and intervention programs could also gain from the results of this study, altering parents to promote autonomy supportive parental behaviors in order to promote their children's' autonomy satisfaction and well-being (Costa, Gugliandolo, Barberis, Cuzzocrea & Liga, 2018). To recapitulate, the findings of this study suggest that for both Greek and Dutch adolescents, the issue of autonomy-support by parents has salience and significance. It appears that despite their cultural differences, perceiving others as supporting one's autonomy facilitates adolescents' autonomy. Although there may be cultural variations in how and to what extent autonomy is supported and expressed, the need to experience one's behavior as self-regulated and self-endorsed may be critical to psychological health across human groups, as Self-Determination Theory has suggested (Chirkov & Ryan, 2001).

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## Appendix

## Chi square tests

			Matched sample		Total
			Dutch	Greek	
1. Age	16 years old	N	2	2	4
		%	9,1%	9,1%	9,1%
	17 years old	N	9	9	18
		%	40,9%	40,9%	40,9%
	18 years old	N	11	11	22
		%	50,0%	50,0%	50,0%
Total	N		22	22	44
	%		100,0%	100,0%	100,0%

## Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	,000 <sup>a</sup>	2	1,000
Likelihood Ratio	,000	2	1,000
Linear-by-Linear Association	,000	1	1,000
N of Valid Cases	44		

a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 2,00.

## Crosstab

			Matched sample		Total
			Dutch	Greek	
2. Gender	Male	N	8	8	16
		%	36,4%	36,4%	36,4%
	Female	N	14	14	28
		%	63,6%	63,6%	63,6%
Total	N		22	22	44
	%		100,0%	100,0%	100,0%

## Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,000 <sup>a</sup>	1	1,000		
Continuity Correction <sup>b</sup>	,000	1	1,000		
Likelihood Ratio	,000	1	1,000		
Fisher's Exact Test				1,000	,623
Linear-by-Linear Association	,000	1	1,000		
N of Valid Cases	44				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 8,00.

b. Computed only for a 2x2 table

## Crosstab

			Matched sample		Total
			Dutch	Greek	
6. Father's educational level (e.g Primary Education- Δημοτικό, Secondary education- Γυμνάσιο ή Λύκειο, IEK, Higher education- AEI, TEI, Master, Phd)	Elementary school	N	1	2	3
		%	4,5%	9,1%	6,8%
	Gymnasium	N	1	3	4
		%	4,5%	13,6%	9,1%
	Vocational High school	N	2	0	2
		%	9,1%	0,0%	4,5%
	General High school	N	4	7	11
		%	18,2%	31,8%	25,0%
	College/After high school education	N	4	2	6
		%	18,2%	9,1%	13,6%

Technical University	N	5	0	5
	%	22,7%	0,0%	11,4%
University	N	5	8	13
	%	22,7%	36,4%	29,5%
Total	N	22	22	44
	%	100,0%	100,0%	100,0%

#### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10,510 <sup>a</sup>	6	,105
Likelihood Ratio	13,297	6	,039
Linear-by-Linear Association	,394	1	,530
N of Valid Cases	44		

a. 10 cells (71,4%) have expected count less than 5. The minimum expected count is 1,00.

#### Crosstab

		Matched sample			
		Dutch	Greek	Total	
7. Mother's educational level (e.g Primary Education- Δημοτικό, Secondary education- Γυμνάσιο ή Λύκειο, IEK, Higher education- AEI,TEI,Master,Phd)	Elementary school	N	0	1	1
		%	0,0%	4,5%	2,3%
	Gymnasium	N	1	2	3
		%	4,5%	9,1%	6,8%
	Vocational High school	N	3	0	3
		%	13,6%	0,0%	6,8%
	General High school	N	3	12	15
		%	13,6%	54,5%	34,1%
	College/After high school education	N	2	0	2
		%	9,1%	0,0%	4,5%
	Technical University	N	10	2	12
		%	45,5%	9,1%	27,3%
	University	N	3	5	8
		%	13,6%	22,7%	18,2%
Total		N	22	22	44

%	100,0%	100,0%	100,0%
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### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17,567 <sup>a</sup>	6	,007
Likelihood Ratio	20,767	6	,002
Linear-by-Linear Association	1,692	1	,193
N of Valid Cases	44		

a. 10 cells (71,4%) have expected count less than 5. The minimum expected count is ,50.

## 8. Father's profession \* Matched sample

### Crosstab

		Matched sample		Total
		Dutch	Greek	
8. Father's profession	no salary	N	0	1
		%	0,0%	4,5%
	below average	N	5	5
	salary	%	22,7%	22,7%
	average salary	N	10	14
		%	45,5%	63,6%
	above average	N	6	2
	salary	%	27,3%	9,1%
	rich	N	1	0
		%	4,5%	0,0%
Total		N	22	22
		%	100,0%	100,0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4,667 <sup>a</sup>	4	,323
Likelihood Ratio	5,535	4	,237
Linear-by-Linear Association	2,414	1	,120
N of Valid Cases	44		

a. 6 cells (60,0%) have expected count less than 5. The minimum expected count is ,50.

**9. Mother's profession \* Matched sample**

		Matched sample		Total	
		Dutch	Greek		
9. Mother's profession	no salary	N	2	5	7
		%	9,1%	22,7%	15,9%
	below average salary	N	0	3	3
		%	0,0%	13,6%	6,8%
	average salary	N	15	11	26
		%	68,2%	50,0%	59,1%
	above average salary	N	5	2	7
		%	22,7%	9,1%	15,9%
	rich	N	0	1	1
		%	0,0%	4,5%	2,3%
	Total	N	22	22	44
		%	100,0%	100,0%	100,0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	7,187 <sup>a</sup>	4	,126
Likelihood Ratio	8,820	4	,066
Linear-by-Linear Association	2,410	1	,121
<i>N</i> of Valid Cases	44		

a. 8 cells (80,0%) have expected count less than 5. The minimum expected count is ,50.