

*Does the Economic Crisis Affect Greek Adolescents' Academic Performance?
An EST Approach*

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Abstract

The Great Recession, as the global economic crisis of 2008 has come to be known, has been the object of research regarding its impact on several parameters of individuals, including academic achievement. Ecological systems theory (EST) as a theoretical framework can potentially offer a deeper insight on the impact of established and well researched distal and proximal factors on students' academic achievement, such as Socio-Economic Status (SES). A person-process-context-time (PPCT) ecological systems model was applied: a longitudinal analysis using cross-sectional data from the Program for International Student Assessment (PISA). The results indicate that student performance is not only significantly affected by family Socioeconomic standards, but also that the economic crisis is a key distal influence factor; as such, it is a significant risk factor for student and teacher performance. It therefore should be taken into consideration when designing educational programs.

Keywords: Academic achievement, ecological systems theory, economic crisis,

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Introduction

The biggest economic and financial crisis of the 21st century to date, also referred to as the Great Recession (Oberg, 2011; Goldstein, Kreyenfeld, Jasilioniene & Karaman Orsal, 2013; Dal Bianco, Bruno & Signorelli, 2014; Schneider, Waldfogel & Brooks-Gunn, 2015) was sparked in 2007 in the USA (Schneider et al., 2015) and resulted in a dramatic drop of national Gross Domestic Product (GDP), high unemployment levels and big reductions in countries' populations' income per capita around the world (Berberoglu, 2012; Dal Bianco et al., 2014). The impact of the financial crisis on virtually every aspect of everyday life and experience is deep and lasting, as it has directly determined national labour market policies which in turn have greatly affected unemployment rates and poverty in all sectors and specifically in the education sector (Dal Bianco et al., 2014). The current study's purpose is to investigate the Great Recession's impact on the students' home Socio-Economic Status ("home SES") that influence students' academic performance (Geritsidou & Paizi, 2017).

It has been suggested (Scarpetta et al., 2010) that youth are especially impacted (economically and occupationally) by financial crises of this magnitude, and even more so in the case of the Great Recession, to the point of characterizing some cohorts in some countries as "lost generations" (Scarpetta et al., 2010), with the aftermath of the negative effect lasting at least five years after the official end of the crisis even if such crisis was very brief (Choudhry, Marelli & Signorelli, 2012). One of the reasons suggested for the even greater impact on youth unemployment is that the transition from the status of student to the status of employee is made harder by the conditions of the shock under which the labour and financial market is operating due to the crisis (Scarpetta, Sonnet & Manfredi, 2010; O' Higgins, 2012). Due to the crisis, efforts for fiscal adjustments and reducing national deficits have incurred drastic reductions in the percentage of country GDP allotted to education (Ruxton, 2012; Fernandez-Rivas & Gonzalez-Torres, 2013). The lack of funding, both at a state and family budget levels has put great strain on the educational systems of countries hit by the Great Recession. At the state level, while research supports that times of economic crises have a positive effect on school enrollment and substitution effects (i.e. using credit economy to provide for the access to education services) that protect schooling access of students in families with financial strain, this relationship hinges on whether there is an increase in governmental spending on education and a relatively functional credit economy (Ferreira & Schady, 2009; Cruces, Gluzmann & Calva, 2012). This is not the case in the Great Recession not only in Greece but in several OECD and Eurozone countries, where education has suffered severe budget cuts (including wages) and the credit economy has also deteriorated (Ruxton, 2012; Fernandez-Rivas & Gonzalez-Torres, 2013; OECD EDIF, 2013). This often leads families to invest less in the education of their offspring as they become older and enter adolescence (Espey et al., 2010).

At the level of the family, economic issues can and do affect how long and how well a family's children will be schooled. Children and adolescents might be pulled away from school in order to help increase the family income or may simply struggle with mental issues that prevent them from fully benefitting from the learning environment at schools (Ferreira & Shady, 2009; Espey, Harper & Jones, 2010). At the same time, there is further deterioration of that learning environment through class disruption and

other externalizing problem behaviors such as bullying (Ferreira & Schady, 2009; Espey et al., 2010; Fernandez-Rivas & Gonzalez-Torres, 2013; Anagnostopoulos et al., 2014, Rajmil et al., 2015).

Teachers are mainly responsible for children's education within the school environment. However, their role has also been compromised due to the crisis. The economic crisis impact forces teachers to work in more challenging ways than before while they are paid less in an adverse economic environment. As a result, job satisfaction and the determination of teachers to remain employed within the educational system of the country are severely challenged and consequently the risk of burnout for teacher rises (Gkorezis, Gkorezis et al., 2016; Dudovitz, Nelson, Coker, Bieli, Li, Wu & Chung, 2016).

In addition to that, a link between teacher performance and their pay sufficiency has been reported as being important for students' academic performance and teachers' motivation to increase their teaching quality and responsiveness, in that they are more likely to innovate and cater to their students' needs in custom-made activities (Lavy, 2009). The pay of teachers has been lowered and this may have had a detrimental effect on the quality of the services rendered, as they primarily become emotionally strained and stressed from the emerging consequent financial problems they personally face as individuals and as family members themselves (Anagnostopoulos & Soumaki, 2013; Kolves & De Leo, 2014).

Research has shown that job satisfaction is directly related to income and economic stability as well as unemployment rates in times of economic crises (Gkorezis et al., 2016). Therefore one could suggest that having the salaries of teachers cut, and their numbers greatly reduced by layoffs or merges that require them to meet greater responsibilities than before, produces a "toxic" set of conditions that is highly likely to cause burnout and higher rates of job dissatisfaction among teachers. These conditions are also highly likely to affect the quality of their work by orienting them to secure their job rather than orienting them to advance and promote their quality of teaching or develop their skills and capacities for the benefit of their students. As such, the quality of teachers' work is at risk of deteriorating (Jackson & Lunenberg, 2010; Markovits, Boer & van Dick, 2014; Mertens & Beblo, 2016). Research suggests that this situation pushes teachers and highly qualified workers in all sectors to migrate to countries with a better work environment that will allow them to grow occupationally without the strain of the financial crisis to the extent that it is felt in countries such as Greece (Markovits et al. 2014; Gkorezis et al., 2016). The perceptions of teachers and their motivation for better performance in the classroom is quite an important element for the overall school quality, and as such the quality of the education system (Dudovitz et al., 2016). Teachers who are experienced, qualified and responsive to parents and pupils make for better academic and mental health outcomes (Ronfeldt, Loeb & Wyckoff, 2013; Dudovitz et al., 2016). It is evident, therefore, that the risks of an increasingly undermined quality of the education system of countries hit by the Great Recession as a result of the budget cuts and lack of resources previously enjoyed are higher, and as such both teacher responsiveness and academic achievement can be expected to suffer (Banerjee, 2011; Bell & Blanchflower, 2011; Gkorezis et al., 2016; Mertens & Beblo, 2016).

The educational system in Greece has been greatly influenced by the economic crisis. After the several consecutive budget cuts and austerity measures imposed is severely unfavorable for students, teachers and parents. Government spending on education has been reduced as much as 20%, teacher salaries have been nominally reduced to 2008 or even 2001 levels while the effect of inflation and direct and indirect tax increases has also further limited the purchasing power of what remains of the teachers' income; additionally, schools have been merged or shut to cut costs, funding for equipment and special programs for support for special needs have become virtually inaccessible (Ruxton, 2012; Anagnostopoulos & Soumaki, 2012; EDIF, 2013, EACEA 2013; Ziontaki, 2016). New teachers are being recruited very sparingly, with new teacher openings in public schools having been reduced by 88% while a further cutback of 10% in governmental funding after 2013 imposed on education is likely to exacerbate the situation (Ziontaki, 2016). At the same time, class sizes in schools have increased and have become more and more heterogeneous, undermining teachers' ability to teach as well as their responsiveness to students and increasing the risk of burnout (Bru, 2009; Gkorezis et al., 2014).

Basic needs such as having students fed are not consistently met anymore as household capacity for proper nourishment and maintenance of their children is deteriorating, on one hand, and funds for standard costs such as classroom heating and building maintenance are progressively withdrawn from schools, on the other (EACEA, 2013; Rajmil et al., 2014; Ziontaki, 2016). At the same time, as already mentioned, services that are not typically the schools' responsibility are being demanded due to the inability of the state to have them met in their proper institutions, such as provision of food, financial and psychological support (Kentikelenis et al., 2011; Anagnostopoulos & Soumaki, 2014, Economou et al., 2014; Zavras et al., 2016; Ziontaki, 2016). There have been indications that social class differences are becoming more pronounced within the school environment among students. At the same time, teachers are increasingly perceiving that the school environment fails to provide equal opportunities in times of such acute economic crisis as the Great Recession (Tzanakis, 2011; Ziontaki, 2016).

Students' socio-economic status (SES) can significantly affect students' academic performance. Specifically, Students with low SES are at a higher risk of low academic performance than students with high SES, an effect that persists regardless of the students' intelligence levels (Bradley & Corwyn, 2002; Schoon & Parsons, 2002; Sacker, Schoon & Bartley, 2002; Rothon, 2005; von Stumm, 2016). Not only is the students' own (and family) SES important as a predictor for how they will perform in school, with higher student/family SES predicting higher probability of high academic achievement (Crawford & Goodman, 2010; Bellibas, 2016), but also the SES of their peers, with higher peer SES associated with higher probability of academic achievement. In the case of their peers, students seem to be thusly affected on more aspects influencing their academic achievement, such as externalizing behaviors and motivation (Valdez, Lambert & Ialongo, 2011; Bould, Crespi & Schmaus, 2012; Nicholson, Strazdins, Brown & Bittman, 2012; McLeod, Uemura & Rohman, 2012; Feng & Li, 2016). Apart from the objectively measured SES, perceived SES of the student also plays a significant role on performance. How the student perceives and categorizes his/her own self as regards his/her own SES might play a role as important as his/her actual SES in the student's sense of well-being and academic performance (Leung & Xu, 2013).

The Ecological Systems Theory

The Ecological Systems Theory (EST) is a model of human development within the context of a person's living environment originally proposed by Urie Bronfenbrenner (1979) (Bronfenbrenner, 2005). According to EST, human beings develop in constant interaction with their social environment, as that is organized according to different levels of influence exerted on the individual (Grant & Ray, 2016). The innermost level of influence is the *microsystem*. It comprises all social elements in direct sustained interaction with the individual (e.g. such as parents, friends, teachers etc). Intimately linked with the microsystem is the *mesosystem*, representing all the individual's relationships at work among the members functioning in different microsystems, and assorted risk or resilience factors that might be associated with them (Neal & Neal, 2013). Encasing and influencing all microsystems in mesosystems is the *exosystem*, comprised of social institutions and organizations not in direct contact with the individual but which influence him/her regardless (e.g. state and government regulations and legislations, etc). Interacting with all these systems and influencing them is the *macrosystem*, comprised of the individual's society's culture, social norms and general beliefs and values. Such elements as the social ramifications of race, ethnicity, religion and assorted beliefs and attitudes are parts of the macrosystem (Duerden & Witt, 2010; Rosa & Tudge, 2013; Grant & Ray, 2016). Finally, the *chronosystem* is comprised by the historical time and the historical conditions in which the individual lives and is raised. The experiences and historically-specific stimuli the individual grows up with will influence profoundly how that individual interprets and sees the world (Grant & Ray, 2016).

The regular interactions of an individual with his/her environment over extended periods of time are called *proximal processes* (e.g. attending school; routines of a child; acquiring skills; making plans) (Bronfenbrenner, 2005). These proximal processes are vital for human development, especially for children and adolescents (Brendtro, 2006; Duerden & Witt, 2010; Burns et al., 2015).

Affecting the proximal processes are the *distal processes*. They are elements that influence the experience of the individual's proximal processes either due to the individual's genetic factors or factors stemming from the individual's exosystem or macrosystem (e.g. SES, culture, rules and regulations, prerequisites and laws in education) (Tudge, Gray & Hogan, 1996; Bronfenbrenner, 2005; Benner, Graham & Mistry, 2008).

Finally, the element of time (the chronosystem), the historical period in which the individual develops and both proximal and distal processes are taking place, is the final facet in EST that can demonstrate that development has taken place. The research design that allows for such simultaneous examination of all the elements of influence including the historical period in which the person develops is called the *process-person-context-time* (PPCT) research design model (Tudge et al., 1996; Bronfenbrenner, 2005).

The current study sought to investigate the moderating impact the Great Recession has had on the association between students' home SES and their academic performance in Greece. The datasets of the Program for International Student Assessment (PISA) for years 2009, 2012 and 2015 were used. PISA is an

international survey that takes place every three years, assessing 15-year-old students from several countries around the globe on their academic competence. The survey provided an estimation of each country's educational system in terms of quality, efficiency and competence building (see About Pisa). The survey is conducted by the Organization for Economic Cooperation and Development (OECD). Greece has participated in all the surveys that have been conducted, the most recent one being in 2015. The surveys are always conducted under strict technical requirements as far as sampling, materials and data collection protocols are concerned in order to ensure samples in each country are representative of its student population and properly weighted and stratified. To operationalize the PPCT model in this study, structural equation modelling (SEM) methodology was applied within the ecological system theoretical framework. It is hypothesized that the Great Recession (the chronosystemic influence) will significantly affect the direct effect of students' home SES on students' academic performance. It is also hypothesized that time will have a significant differential impact on the direct effects of student's home SES on teacher responsiveness and in-class disruption.

Method

Participants

Across all three cohorts the dataset sample was reduced by excluding all participants except those that identified themselves as Greek, reported both parents being Greek and the spoken language at home as Greek. Similarly, respondents attending technical and evening schools were excluded as the focus of this study was on students attending regular five-day-a week daytime mainstream secondary schools.

As a result, the 2009 sample was reduced to 3403 students, the 2012 sample to 3334 students and the 2015 sample to 3710 15-year-old students. Across all three samples, girls were approximately 50-53% of the sample size and boys 50-47% with a standard deviation of about .49.

Materials and Analysis

To be able to plausibly compare the responses from the three different years, those items and parts of the materials in the PISA datasets were selected that were either identical in their phrasing and manner of measurement or standardized. Structural equation modeling (SEM) was selected as the methodology of statistical analysis (Arbuckle, 2013, Byrne, 2010).

SEM is a two-stage procedure of statistical analysis of covariance for multivariate data, in a structural model that includes manifest and latent variables. SEM is particularly well suited for using data analysis to make inferences while maintaining a confirmatory approach as it is based on covariance rather than correlation analysis. Covariance structure analysis is a statistical approach that generally yields more information than correlational analyses as it can map out how two variables covary rather than simply their correlation (Byrne, 2010; de Carvalho & Chima, 2014).

For the current study, the same structural equation model was used to test the hypothesis of mediation of the effect of student home SES on student performance,

teacher responsiveness and in class disruption, simultaneously for the years 2009, 2012 and 2015. In order to measure the effect of time on the model, i.e. the financial crisis in Greece, the following analysis was applied: the full structural model was estimated for all three years separately for goodness-of-fit as stand-alone SEM. Afterwards, all three models were tested simultaneously to derive a multigroup solution and permit the ad hoc testing of selected structural paths for significant differences across groups. Significant differences across groups found, by means of the Chi-square difference test, indicate the presence of a significant effect. Any statistically significant difference detected in the three SEM for years 2009, 2012 and 2015 are plausibly a function of the moderator which in our case is time (i.e. the effect of the crisis that had its official onset at 2009 and is still ongoing), according to the principles of the EST (Bronfenbrenner, 2005).

Results

The effect of time (the economic crisis in Greece) as a moderator of the structural estimates between years 2009, 2012 and 2015. The effect of the moderator is estimated by the chi-square difference test ($\Delta\chi^2$). The chi-square difference test is considered a precise test (Arbuckle, 2013) and therefore it is a reliable basis for the assessment of moderator effects (Barron & Kenny, 1986; Muller, Judd and Yzerbyt, 2005).

The chi-square difference tests for years 2009, 2012, 2015 were performed on the following structural paths: SES \rightarrow PER (the effect of student home SES on performance), SES \rightarrow TEA (the effect of student home SES on teacher responsiveness), SES \rightarrow DIS (the effect of student home SES on in class disruption). The chi-square difference test was: $\Delta\chi^2=(1604.911-1558.730)=46.181(2)$, $p\leq.001$. We reject the null hypothesis of no difference between the SES \rightarrow PER path across the three years (omnibus test).

For the same structural path, for years 2012 and 2015, the chi-square difference test was: $\Delta\chi^2=(1576.185-1558.730)=17.455(1)$, $p\leq.001$. We similarly reject the null hypothesis of no difference in the SES \rightarrow PER path between years 2012 and 2015.

For the SES \rightarrow TEA path, the chi-square difference test was: $\Delta\chi^2=(1595.543-1558.730)=36.813(2)$, $p\leq.001$ across the three years (omnibus test). We reject the null hypothesis of no difference in the SES \rightarrow TEA path across the three years.

For the same structural path, for years 2012 and 2015, the test was: $\Delta\chi^2=(1562.092-1558.730)=3.36(1)$, $p=.066$. We fail to reject the null hypothesis of no difference in the SES \rightarrow TEA path between years 2012 and 2015.

For the SES \rightarrow DIS path, the test was: $\Delta\chi^2=(1573.405-1558.730)=14.675(2)$, $p\leq.001$ across all three years (omnibus test). We reject the null hypothesis of no difference in the SES \rightarrow DIS path across the three years.

For the same structural path, for years 2012 and 2015, the test was: $\Delta\chi^2=(1567.378-1558.730)=8.648(1)$, $p\leq.001$. We similarly reject the null hypothesis of no difference in the SES \rightarrow DIS path between years 2012 and 2015.

Discussion

Results demonstrate that there is a significant effect of the Great Recession on the school-based proximal processes of 15-year old Greek students, as well as on the distal process of students' home SES; thus confirming the findings of current research on the effect of the economic crisis (Bittman & Bradbury, 2012; Banerjee, 2011; Bould et al., 2012; Anagnostopoulos & Soumaki, 2013; Brydsten et al., 2016).

Across the three years examined in the study, students' home SES was consistently found to exert a direct effect on students' academic performance. This suggests that the students' access to resources as well as his/her perception of his/her own SES plays a significant role on how he/she will perform academically within every year, in line with previous research findings (e.g. Schoon & Parsons, 2002; Sacker et al., 2002; Rothon, 2005; von Stumm, 2016).

What is noticeable is that from year 2009 to year 2012, this effect becomes much stronger. The year 2009 was still the beginning of the Great Recession for Greece. However, year 2012 was well within the negative impact of the crisis, with all the impacts described in the introduction deeply felt (Kentikelenis et al., 2011; Anagnostopoulos et al., 2013). It can be suggested, therefore, that access to resources and goods becomes immediately more important a factor in order to maintain performance levels since family home SES exerts a stronger influence on the likelihood of better academic performance of the student as the crisis progresses (Goodman et al., 2011; Valdez et al., 2011; Enriquez et al., 2012; Bould et al., 2012; Nicholson et al., 2012).

Year 2015 still was a year deep in the social turmoil of the recession, with increasing cost of living and increasingly limited access to the resources available to the average Greek (Kokkevi et al., 2014; Ziontaki & Vissariou, 2014; Ziontaki, 2016). However, it was also a year of intense political turbulence. For a big part of 2015, except for the dire circumstances of the impact of the Great Recession, there was also considerable hope in Greek society that the austerity policies would be terminated post-elections and instead social support would be reflected on new policies that would increase accessibility to goods and services for the average citizen in Greece (Wood, Szamosi, Psychogios, Sarvanidis & Fotopoulou, 2015; Catsambas, 2016). That hope never materialized, as indicated by later surveys and reports (Catsambas, 2016; Zavras et al., 2016). It is interesting therefore that during 2015, the effect of student home SES on students' performance remains much higher than that of 2009, but it seems to have lessened somewhat, compared to that of 2012. This statistically significant fluctuation could be better explained in future research if comparison of the next PISA assessment cycle's data is performed in 2018. It could be suggested, however, that the perceived levels of SES the students have during 2015, could be due to a possible hope that life would begin to revert to pre-crisis standards,

The effect of the Great Recession is quite stark in the progression of the effect of students' home SES on teacher responsiveness. While in 2009, when the full brunt of the crisis had not yet fully hit, there was a small positive effect of SES on teacher responsiveness, implying that the student's family was able to ensure better teacher quality for their children, this effect becomes non-significant and changes direction (becomes negative) in 2012, while in 2015 the effect remains negative and becomes

much stronger. This seems to indicate that students' home SES becomes unable to positively affect teachers' responsiveness three years into the crisis and in fact affects it negatively six years into the crisis. The results seem to confirm earlier research (eg. Jackson & Lunenberg, 2010; Markovits et al., 2014; Mertens & Beblo, 2016).

Considering that teachers were severely hit by the budget cuts, pension and wage cuts (EDIF, 2013; Ziontaki, 2016), it can be suggested that teachers' responsiveness suffers as a result of their low job satisfaction as well as the stress and strain of having to do more with a lower income. The drastic changes in the class parameters, some of which include larger student numbers and higher levels of heterogeneity among students also is likely to play a role, thus accounting for the negative effect of students' home SES on teacher responsiveness in 2015 (Bru, 2009; Anagnostopoulos & Soumaki, 2012; Ziontaki & Vissariou, 2014; Ziontaki, 2016).

Another interesting observation is that, unlike the case of students' home SES on students' performance, the political turbulence and temporary change in hope and outlook of the Greek society about the anticipated end of austerity during 2015 does not seem to have reversed the direction of teacher responsiveness in 2015.

For the teachers, this suggests that vague expectations of improvement in the teachers' standard of living, as well as that of the average citizen, do not constitute a strong resilience factor able to protect against the actual impact of the crisis on their actual circumstances and their responsiveness at school. This interpretation finds support in research (Tzanakis, 2011; Lee, 2012; Markovits et al., 2014) that has shown that such expectations cease to have any positive or protective impact on general life outlook and associated job performances when the economic threat faced is too severe, as is the case in Greece (Kentikelenis et al., 2011; Matsaganis & Seo, 2014; Ziontaki, 2016; Gkoretzis et al., 2016).

For year 2009, the effect of student home SES on in-class disruption was small, negative and non-significant. In year 2012 it not only changes direction, becoming positive, but also becomes of considerable magnitude and significant, only to revert to a small, non-significant yet still positive effect in 2015. **There can be several suggestions to explain such an effect.** Primarily, research has shown that class disruption can be a function of the school's lack of consistent administrative and pedagogical policies as well as large class sizes (Valdez et al., 2011; Lavy et al., 2012; McKee et al., 2014).

Before the crisis onset, Greek public schools did not suffer from great reshuffling or disruptive changes (Ziontaki, 2016), just like their private counterparts, while unlike their private counterparts, right after the onset of the crisis, state schools started going through merges and close-downs as well as having differences in the class parameters and a shortage of teachers that also become progressively more pronounced. It could therefore be suggested that by year 2012, student home SES differences in relation to the school quality became more relevant as the crisis' impact started to become felt: students for whom their family could ensure access to a school with more resources and more consistent day-to-day conditions, could enjoy a better class environment than students who had to endure a constant situation of flux and a downward spiral for their school, ranging from access to amenities to staff quality (Boulton, 2008; Bru, 2009; Lee, 2012; McKee et al., 2005; Weiss, 2017).

However, this situation seems to change for year 2015. It appears that student home SES can only very moderately protect students from a disrupted class environment. This could be due to the teachers' worsening mental health, job satisfaction and financial situation (Ruxton, 2012; EACEA, 2013; Ziontaki, 2016), in conjunction with the effect of changes of student home SES parameters over time, including perceived SES changes across social classes and associated changes in SES composition (mother's and father's occupational status, wealth and cultural capital measures).

This can be a reason for class disruption, since the teachers cannot engage their students academically or motivate them as efficiently as they could before, regardless of their students' home SES and associated cultural capital, and as such discipline becomes problematic (Tzanakis, 2011; Valdez et al., 2011; Wubbels & Brekelmans, 2005; Lee, 2012). Thus, the traditional role of the teacher as an agent of class reproduction (Bourdieu and Passeron, 1977) cannot possibly be sustained under these conditions (Tzanakis, 2011).

Conclusion

This study is one of the few, if not the only one to date, to examine the impact of the Great Recession on students' academic performance using an EST approach, and in particular by applying the PPCT research design. It was shown that the Great Recession significantly affects students' performance through SES, teachers' responsiveness and class disruption. It becomes evident that the economic crisis has much deeper and lasting an impact on education than it was thought. This is the reason why the consequences of the economic crisis must be taken into consideration in educational planning and rigorous intervention is necessary to provide students with resilience against it.

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