FACTORS INFLUENCING UNIVERSITY STUDENTS' ACCOMMODATION CHOICES: RISK PERCEPTION, SAFETY, AND VULNERABILITY

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ABSTRACT

Students'mobililty has grown considerably in the last decades and student housing has recently started to be studied more consistently, because of the high pressure on the private market. However, its implication for policy making and societal resilience remains a marginal topic in the scientific debate and further studies are needed to meet the goals of the Sendai Framework for Disaster Risk Reduction. Students could be seen as a vulnerable category to be considered to understand and reduce disaster risk, and to develop tailored strategies for the mitigation of human losses. In this paper, we investigate which factors influence university students' decision to rent a room with a focus on risk perception and safety awareness. The research focuses on a case study in Ancona, Central Italy, where we surveyed 338 students of the University of Ancona, which shares similar characteristics with the 2009 precursor in L'Aquila. Our results highlight that safety is not the paramount factor influencing students' choice for an accommodation and that not all the students were able to define the risk level of the city they live in. On the contrary, students considered the rent as the most important factor influencing their choices, followed by the proximity of the accommodation to services. The discussion points out that decision makers must integrate vulnerability reduction strategies on student housing plans at three different level, especially education and awareness strategies. The conclusions suggest some priorities to be undertaken in policies, define limitations and open questions to be addressed in future researches.

1   INTRODUCTION

Over the past 40 years the mobility of students has grown considerably as consequence of the globalization of higher education; the number of students who studied abroad raised steadily since the 1970's, growing fourfold between 1975 and 2008 (Beine et al. 2014). Furthermore, the ongoing expansion of higher education in Western countries have had strong consequences on the housing market, challenging the provision and development of student housing in many college towns (Thomsen & Eikemo, 2010). The higher pressure on the private market and issues related to student's accommodation, have become a concern for both urban planners and managers, increasing the relevance to this field of research.

Nowadays, the literature includes studies on the determinants of students' mobility (Beine et al., 2014), on student's satisfaction (Nurul Ulyani et al., 2010; Thomsen & Eikemo, 2010), and on the quality of housing services (Brasington, 2009). Other authors focused more on the decisional component of student's decisional process and on the physical and social factors that influence the satisfaction levels; Thomsen (2010) argued that students prefer choosing central locations in university cities, and that the proximity of housing to the city centre and the place of study are key factors influencing the levels of satisfaction. It has been pointing out that most of the students share the same five main problems associated with private housing market: *high rent, low housing standards, doubtful contract terms, lack of available housing, and housing far away from campus (*Thomsen and Eikemo, 2010). This pattern does not change considering international students in 13 countries, as housing prices impacts the mobility, affecting the overall affordability of education (Beine, 2014). The tendency of students to live in modest, inexpensive accommodation was fatal for several of them during the 2009 L'Aquila earthquake in the Central Italy (Alexander & Magni, 2013). The event killed 308 people living in 19 different locations and 55 students, 8 of them concentrated in the same student dorm that collapsed (Alexander, 2010). The high number of students' life losses, compare to the total of deaths (one out of six), highlight the need for better considering the drivers of students' vulnerability and safety, mainly in relation to their risk perception and the safety of their accommodation. However, it has been highlighted that, despite the progresses, most researches failed to provide meaningful guidance for student housing managers and university administrators (Foubert et al., 1998; Khozaei et al., 2010; Najib et al., 2010). An aspect that has been neglected in the literature is the understanding of the vulnerability of the students and how it could be possible to improve their safety, especially in areas at risk that

are subjects to recurrent hazards such as earthquakes. This, far for being a self-standing topic, but must be contextualised in its social, political, and cultural dimensions.

This paper aims at contributing to this process, analysing the students' decision-making process to address their vulnerability levels, and raising their level of safety awareness. The research focuses on a case study in Ancona, Central Italy, investigating the risk perceptions of the students of the Università Politecnica delle Marche using a structured questionnaire (N= 338). First, we introduce the concepts of disaster risk reduction, vulnerability and community resilience to support the development of the paper. Secondly, we explain the methodology of the research to maintain a replicable process of data collection; secondly, we illustrate the key statistical findings. Thirdly, the results are discussed and contextualised in the current scientific and political debate. The aim is to suggest possible options for vulnerability reduction strategies, raising the safety awareness. The conclusion points out the implications for the implementation of the Sendai Framework for Disaster Risk Reduction, suggesting for example the need for launching new ad-hoc educational campaigns and presenting new open questions for scholars.

1.1   Disaster Risk Reduction, local culture, and community resilience

Disaster risk can be considered an effect of the dynamic interaction of hazards, vulnerability, and exposure (Alexander, 2000). According to this approach, vulnerability is amplified by intensifying factors, such as corruption or negligence, but can also be reduced by scientific research and the integration of lesson learned in planning and policies. Since the 80s, the concept of vulnerability evolved, and has been associated to the conditions of society that determine the potential impact of hazards in terms of losses (Birkmann, 2007). As argued by Wisner et al. (2003) a "housing shortage" cannot be explained just by the statement that "there are not enough houses being built or too few people with enough cash", but they are the effects of wider root causes that needs to be addressed. Considering specifically earthquakes, the vulnerability levels are determined by elements such as housing materials and building standards, but also "building safety, income level, available spare time and the ability to keep habitations in good repair, type of tenure (owner-occupier or rented accommodation in urban areas), location of dwelling relative to zones of seismic activity, ground stability and degree of support networks which could be mobilised after the event" (Wisner et al., 2003:p. 121). Moreover, it can be noted that disasters are rooted in the political processes: the existence of differential vulnerabilities among groups and inviduals can be

associated with power distribution and relational dynamics, but it can also happen in an "innocent" ways associated with choices that are made just for keeping livelihood (Cannon, 2008). Acknowledging that students can be particularly affected by those dynamics, as the L'Aquila event demonstrated (Alexander, 2010), a better understanding of their decision-making process could support some better mitigation and preparedness strategies. This is particularly relevant for the implementation of the Sendai framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2015), which highlights the need to use new datasets for producing effective measures to prevent and reduce life losses.

The relevance of the local context in the creation and determination of disaster risk is fundamental element to understand how student housing could be relevant for preparedness strategies and mitigation policies, involving wider considerations on the resilience of communities to adverse events. In disaster management, resilience can be considered the capacity of as system to prepare,absorb, recover and adapt to an adverse event (Linkov et al., 2014). The central elment to consider in the assessment process is that the root causes of disasters are settled in the socio-cultural domains, determining the background conditions for the evolution of crises (Hewitt, 1995; Alexander, 2000),and becoming a critical variable for understanding how people make sense of and react to the disaster (Hewitt, 1995; Alexander, 2005).In other words, disasters can be seen as social constructs, where some of the componets of local resilience are necessarily associated with social responsibilities (Hewitt, 1995). Resilience cannot not just a results of individual behaviours but included the need to contextualise in wider considerations about culture, community structure, policies and economics (Alexander, 2000; Wisner et al. 2003). It can be seen as the results of the dynamic interaction between the physical, information, congnitive and social domains, involiving drivers such as the state and capacity of emergency personal but also social networks, institutional capacities and adaptive changes of institutions and policies (Linkov, et.al, 2014). Moreover, the components of resilience can include elements such as organisational capacities and coordination that have been activated at the local levels, such as the community members that have been trained to perform basic activities during emergency response (Twigg, 2009). It is not just a matter of resources available, but it includes the consideration of "enabling environments" that can activate virtuous cycles of adaptation including the institutional, political, and socio- economical factors (Twigg, 2009) Centralizing social justice, empowerment of local communities, inclusiveness and investments in social capital can be seen as essential elements for

fostering resilience (Gil-Rivas & Kilmer, 2016). In conclusion, resilience can be considered than a dynamic process that involve all leves of social structure (individuals, family and communities) that can be addressed, cultivated, and evolved (Miller, 2012). These drivers must be then associated also with the specific features of local economy, considering possible impacts and resilience tools for protecting and prepacre clusters such as small medium enterprises (Ingirige and Wedawatta, 2011;Wedawatta and Ingirige, 2016). Figure 1 explains how disasters evolve in socio ecological contexts determined by the complex interactions between the event, the affected community and external factors such as macro political dynamics or global interconnected risk (Miller and Pescaroli, 2018).
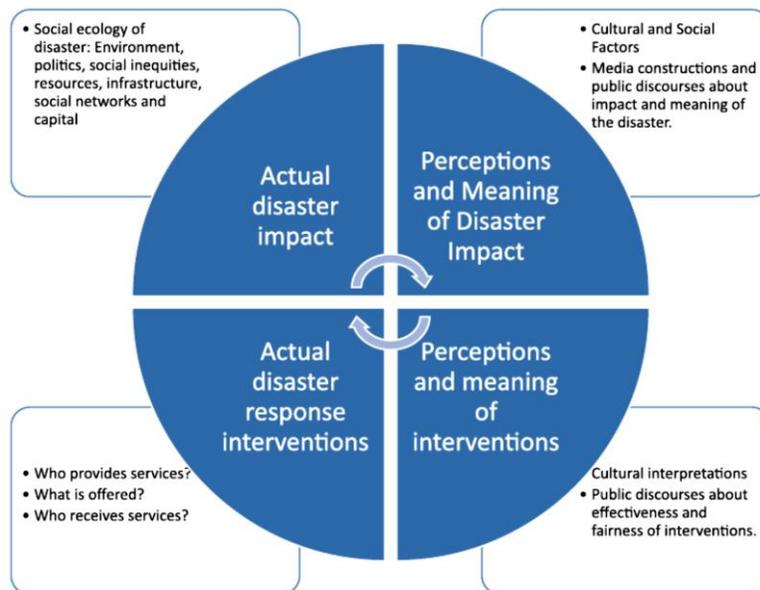

Figure 1: Meaning making of disasters in a socio-ecological perspective (Miller and Pescaroli, 2018)

It must be noted that he recent literature suggest that a more integrative process has been incorporated in disaster risk reduction practices (Gaillard and Mercer, 2013), but new tools for resilience assessment should consider also the societal impact of disasters, such as the disruption of social networks, organisations and critical infrastructure and the resilience (Linkov et al. 2014). Hence, defining the risk perceptions of student housing can be considered a tool for addressing policies and activating positive feedbacks to mitigate disaster risk according to ground theories such as the one by Alexander (2000), and Wisner et al. (2003). The next sections will describe the

methodology used for the case study of this research, than propose and discuss the results used for practical suggestions in the conclusions.

2   METHODOLOGY

2.1   Research design and data collection

Given the general lack of previous specific studies on this topic, a survey was conducted to investigate which are the main factors that influence the students' decision to rent a room. The survey was carried out between June and December 2016. The methodology was developed according to the criteria for quantitative procedures (Tabachnick and Fidell-Allyn, 2006). Since data were normally distributed, parametric tests were selected either to find pattern to be employed in the computing of composite scales (Exploratory component analysis) or to explore relationships among categorical and continuous variables (One-way repeated measures ANOVA, Multiple linear regression with backward elimination).

2.2   Study area

Data were collected through a structured questionnaire which was distributed either by hand, in the premises of the Università Politecnica delle Marche (Ancona, Italy), or shared online in dedicated forums and social media, to maximize the number of participants. Ancona is the capital of the Province of Ancona and of the Marche region (Central Italy), with a population of 100.861 inhabitants. The city is located on the East coast of the Adriatic Sea at 43°3T N, 13°31' E, and it share similar characteristics with L'Aquila. It significance as a case study can be associated with its different features in terms of hazard risk but also of social and environmental vulnerabilities. Firstly, as visible by Figure 12 Ancona is classified as a medium to high seismic zone by the Italian Institute of Geophysics and Volcanology (INGV).

Figure 2: Seismic classification of Italy (Ordinance n.3519, 2003)

In 1982, Ancona suffered a six-month earthquake swarm with maximum 5.4 Mw registered on June 14th 1972 (Kisslinger, 1972). As a result of the earthquake almost 30,000 people were displaced and, given the long lasting seismic swarm, approximately a total of 90,000 left the city and moved to neighbouring hamlets and municipalities (Frezzotti, 1997). Secondly, Ancona hosts the Università Politecnica delle Marche with 15633 students enrolled. In the last ten years, the number of students at the University has raised from 10,579 to 15,633 and the number of students coming from outside the region has raised from 56% to 67%. Lastly, Ancona reflects the condition of Italian housing: the vast majority of the Italian Universities do not own student's accommodations and students usually rent rooms in the city centre, that mostly corresponds to the historical nuclei, where unreinforced masonry (URM) buildings are the most typical widespread housing typology (Valluzzi et al., 2007) and present the weakest building stock in terms of seismic resistance. Moreover, it has been demonstrated that traditional masonry or bricks and badly reinforced concrete and unreinforced buildings are the most vulnerable constructive typologies to the ground acceleration movements (Daniell et al., 2011; Magenes and Calvi, 1997, Grunthal, 1998). The vulnerability of traditional buildings is not only associated with collapses caused by strong events but also with losses caused by moderate earthquakes (D'Ayala and Speranza, 2002). In addition, about 80% of the Italians (ISTAT, 2004) live in buildings erected before the first national law on construction techniques to adopt in seismic areas (L. n.64, 1974) came into force; therefore, these structures cannot be considered utterly safe. Before then, municipalities were

classified in a high level of seismic risk just after being strongly damaged by an earthquake. As claimed by Decanini et al. (2004), except for site-specific amplification and frequency of seismic waves, inadequate construction techniques seem to be the most important contribution to determine the damage pattern.

2.3   Sampling methodology and questionnaire

Participants were recruited at the Università Politecnica delle Marche in three different gathering events, adopting a non-probability convenience sampling with the methodological features of the street-intercept survey. The questionnaire was also posted and shared on two main websites used by the students (http://www.gulliver.univpm.it/). To be included in the study, participants should have met the following criteria:

- Being offsite students;
- Renting an accommodation in the municipality of Ancona.

The study adopted a mixed-method which integrates face-to face contact with self-completion of the paper-based questionnaire (Roberts, 2007; De Leeuw, 2005). The participants were supported by investigators to provide an in-depth insight into the purposes of this research and to support them in the completion of the questionnaire in an anonymous way, reducing the possibility to obtain a low return rate due to misunderstandings or social desirability bias. At the end of the survey, most of the questionnaire were collected face to face with a response rate of 95%. Data collection and analysis were carried out following the policies adopted by the Università Politecnica delle Marche (UNIVPM). Each respondent provided verbal informed consent prior to participation and voluntarily decided whether to participate or not. The authors collected no identifying data on participants. All the interviewees were informed about the scientific purpose of the study survey and on the use of data collected.

The questionnaire consisted of two parts: the first part aimed at collecting information on gender, faculty attendance and details about respondents' renting experience such as how long they have been in the city, how many houses they have rented in Ancona and how much important they considered spending time to look for an adequate accommodation. Students were also asked to classify the seismic hazard of Ancona using a scale was based on the classification adopted by the INGV: very low, low, medium, high; to express their concern that an earthquake could hit Ancona on a scale from 1 to 5 (1. Not at all; 2. Slightly concerned; 3. Moderately concerned; 4. Concerned;

5. Extremely concerned). At last, we asked them how much they pay monthly (€). The second part, consisted of 9 statements about factors that influence the decision of students when called to rent an accommodation. Participants were asked to rate the importance of each statement using a five item Likert-type scale: 1. Very low; 2. Low; 3. Medium; 4. High and 5. Very high. The factors can be classified in 3 main groups: a) costs 2) proximity to services and 3) safety. Cost factors were related to the rent per month, the bills expenses and the cost of furniture whilst proximity of services was related to the proximity of the university, transport and fun places. To assess the safety, the year of construction, the state of maintenance and the construction materials of the building were used.

3   RESULTS

A total of 338 students took part to the survey; 51% were females, a slight overestimation respect to the actual enrolment percentage (44%). Forty-two percent of the respondents enrolled at Engineering, 23% at Mathematics, Physics and Natural Science, 17% at Medicine and Surgery, 16% at Economics, and 2% at Agriculture and Forestry. Averagely, respondents had been living in Ancona 3.76 (±2.77) years, moving 2.1 (±1.16) houses. 58% of the participants correctly said Ancona is medium seismic hazard area, 14% overestimated the seismic hazard (High), while 28% underestimated it (25% Low, 3% Very low). Most of them were moderately concerned that an earthquake could occurred in Ancona (32%), 42% were slightly concerned or not at all, and 26% were concerned to extremely concerned. Fifty-two percent of the students considered moderately important spending time to find an accommodation, 26% not important, and 22% very important. Most of the rented accommodation (72%) were in 201-250€/month range or 100-150€/month range (16%); the remaining were in 151-200€/month (5%) or in more than 250€/month (7%). Figure 3 reports the results to five item Likert-type scale statements aimed at investigating the factors the interviewed considered when hired their current accommodation.
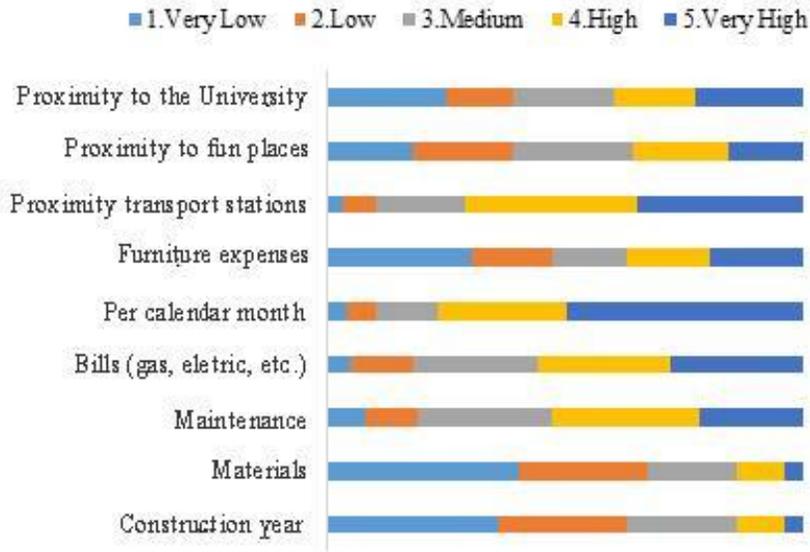
Figure 3: Results of the five item Likert-type scale statements on factors considered by students in hiring an accommodation

3.1 Data analysis

The nine five item Likert-type scale statements underwent an exploratory factor analysis (EFA) aimed at determining the correlation among the variables and investigating the presence of a factor structure. Principal components analysis (PCA) was employed because the primary purpose was to identify components for the development of scales to be entered as (1) dependent variable in the linear regression performed at the next stage of the process; and as (2) measures for Friedman's two-way analysis of variance. Prior to running the PCA, data were checked to validate the assumptions required for PCA: the correlation matrix revealed each items highly correlated ($r_p >$ .05) with at least two other items; the Kaiser-Meyer-Oklin measure of sampling adequacy was .64, above the commonly recommended value of .06 (Kaiser, 1974); and the Bartlett's Test of sphericity was highly significant ($\chi^2(3) = 725.58$, p<.001), supporting the relationship among the variables included in the analysis; the diagonals of the anti-image correlation matrix were all over .06, confirming the common variance among the items; the communalities were all above .3, endorsing that each of the items shared some common variance with the others. The PCA revealed the presence of three components explaining 72.9% of the variance; pattern and rotated component matrix (VARIMAX) are shown in table 1.

Component

	1	2	3
Construction year	.908		
Materials	.888		
Maintenance	.729		
Bills (gas, electric, etc.)		.870	
Rental		.845	
Furniture expenses		.536	
Proximity to transport stations			.826
Proximity to fun place			.735
Proximity to the university			.916

Table 1: Pattern and rotated matrix for the three components

Three composite scales were computed according to PCA indications. Costs, proximity to services, and Safety scales were computed by the mean of the items composing each scale. The internal consistency of the composite scales was tested according to Kline's indications (1999) which set 0.7-0.8 as an acceptable value for Cronbach's α. All the scales resulted to have good internal consistency; in depth, the scales reported the following coefficients: Costs scale (0.76), Proximity scale (0,74), Safety scale (0.82). A One-way repeated measures ANOVA was conducted to compare costs, proximity to services and safety. Results indicated statistically significant differences among the composite scales, Wilk's Lambda = .62, $F(2,332) = 100.72$, $p < 0.0005$. Three post hoc tests using the Bonferroni correction revealed significant differences between: Costs (M=3.5±0.96) and proximity to services (M=3.3±0.79); Costs (M=3.5±0.96) and Safety (M=2.59±1); proximity to services (M=3.3±0.79) and Safety (M=2.59±1) (Figure 4).
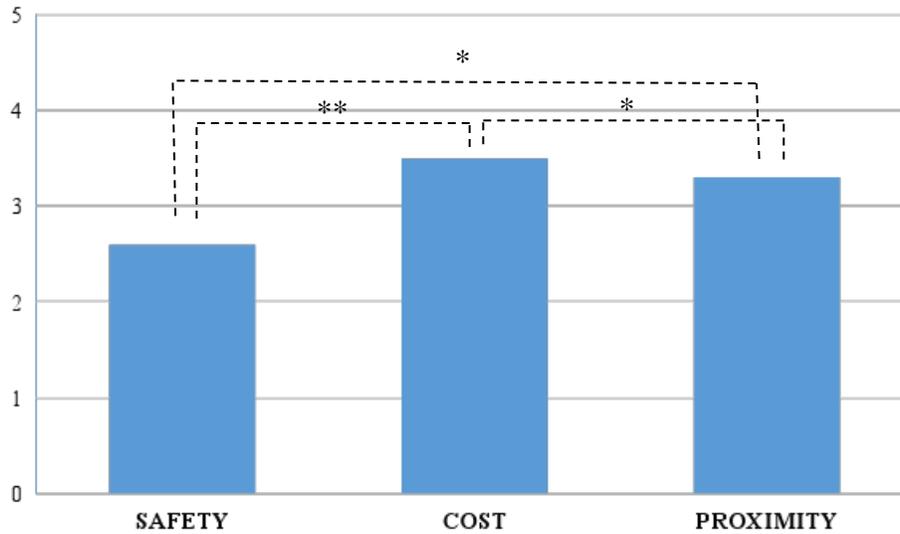
Figure 4: Mean values of the three scales with the relative statistical relationships
(*Significance at .05 level/**Significance at .005 level)

A multiple linear regression with backward elimination selection method was conducted to test the ability of the independent variables to predict the outcome variable (Safety). The predictors entered in the analysis were: time lived in Ancona (years), number of houses inhabited in Ancona (N), importance of spending time to find an accommodation (Likert scale), perception of seismic hazard (Ordinal scale), concern of a potential earthquake in Ancona (Likert scale), Rental per month (Ordinal scale). Preliminary analyses were conducted to find out whether data satisfied the assumptions of normality, linearity, homoscedasticity, and multicollinearity. Furthermore, the nominal variable "earthquake hazard in Ancona" was recorded and entered the equation as it follows: 1. Overestimation (High) – 2. Correct (Medium) – 3. Underestimation (Low and Very low). Then, this predictor was introduced as two dummy variables with the value 2. Correct as baseline group (value = 0). The first model, containing 7 predictors, was statistically significant (F $(7, 328) = 3.03$, $p<0.005$) with an Adjusted R^2 of .042. The final model, containing four predictors, was statistically significant ($F (4, 331) = 4.86$, $p<0.005$) and it explains 4.6% of the variance in the outcome variable. As evincible by Table 2, respondents' predicted score on the SAs is equal to 1.68 + .157 (Concern) + .167 (Rent) - .29 (Hazard Overestimation = 1) + .249 (Hazard Underestimation = 1).

MODEL	Unstandardized Coefficients		Standardized Coefficients	t	95,0% Confidence Interval for B	
	B	S.E.	Beta		Lower Bound	Upper Bound
(Constant)	1.677	.243		6.910	1.199	2.154
Hazard Overestimation	-.290	.163	-.100*	-1.778	-.611	.031
Hazard Underestimation	.249	.130	.111*	1.918	-.006	.505
Concern for potential earthquake	.157	.048	.186**	3.242	.062	.251
Rental per month	.167	.067	.134**	2.506	.036	.298

Table 2: Respondents' predicted scores and coefficients
(*Significance at .05 level/**Significance at .005 level)

All the predictors were statistically significant, with the variables "Concern for a potential earthquake" and "Rental per month" making the most significant contribution to the model.

4   DISCUSSION

Only 58% of the participants defined Ancona as medium seismic hazard area as classified by the INGV map, whit almost the 30% underestimated it. Most of them were not enough concerned that an earthquake could occurred in Ancona with only 26% concerned or extremely concerned. Considering the risk levels of the area, those numbers indicate that the awareness and the knowledge of students about possible risks were not sufficient, suggesting exploring further possible mitigation actions to undertake. The results confirm the diffused opinion about the need for improving community resilience, acting on the cultural context to reduce the general vulnerability levels in the communities in which students are hosted (Alexander, 2000; Wisner et al., 2003; Birkmann 2007). This could be associated with a general lack of good practices on citizens' preparedness in Italy and on the integration of vulnerable categories at large, as it has been demonstrated in previous researches on earthquake risk (Alexander,2010; Pescaroli et al. 2014). In other words, our results are in line with the findings of other surveys undertaken in the country, which suggest a general lack of citizens' education and training that has root causes in contextual elements such as the approach of the Italian Civil Protection (Alexander,2010; Pescaroli et al. 2012). For example, the online questionnaire (N=1839) administered to the general population by Pescaroli et al. (2012) suggested that just one third (29%) of the valid responses knew the seismic hazard classification of their area, while most of them knew it only in marginally (55%), and a minority was not aware of it or not at all (15%). The same questionnaire highlighted that the 45 % of the respondents did not know at all if their home was earthquake-resistant, while nearly a third (28%) knew it just partially, and less than a third knew it properly (26%). However, there are some specificities that needs to be addressed by decision- makers for reducing students' vulnerabilities, involving: a) the hosting universities and their administrative organisation; b) the local community and its policy makers. This must integrate different tools and strategies for improving training, education, and to raise risk awareness level. The results of our questionnaires show that almost one third of the respondents underestimated the hazard level of the city, and most of them were insufficiently concerned about a potential earthquake. Despite the data could be associated with other evidence in Italy, as described above, same considerations are common with the vulnerability levels of students recorded in areas with an high exposure to natural hazards across the world. For example, a research by Lovekamp and Tate (2008) demonstrated that a large majority of the students (76%) at the Midwestern University (Downers Grove, Illinois) were not

prepared to face an earthquake. This suggest the needs for specific actions that involve the hosting organisation, intended as the administrative and political apparatus of the universities. A specific concern in our dataset is that approximately three third of the students did not sufficiently consider the knowledge of materials and construction years of the houses they were renting, while this was in contrast with the perceptions of safety that was high. This lack of consistency shows that focused actions on information and education are needed, and this could be provided, for example, by the university housing services. It is true that the students' knowledge on disaster and emergency procedures (emergency response) seems to be particularly deficient in general, and this is a current gap verified in the literature on emergency preparedness among university students. Some authors argued that the barriers in preparedness can be reduced by increasing the administrative support of the University and community-based emergency preparedness agencies (Tanner & Doberstein, 2015); however, it has been highlighted that, independently from the type of hazard, emergency preparedness of students needs to be very specific to be effective (Watson et al., 2011). Focused education, such as school-based programmes could be a key factor to enhance the understanding of good practices in vulnerable groups and within the community (Tatebe & Mutch, 2015).

Other considerations can be derived from our results to understand how the student's decision-making process in housing could orient the political decision-makers. Our survey demonstrated that students tend to consider costs as the most important factor in the renting process, followed by the proximity to services. The concern for a potential earthquake and the rental per month resulted to have a significant, positive impact on determining the score on the Safety scale; the hazard perception made a significant contribution either, with the hazard overestimation having a negative effect on the safety scale, and the hazard underestimation the opposite. Although these results are in line with the previous studies and the literature (Thomsen and Eikemo, 2010; Beine, 2014), they introduce other considerations on disaster reduction, in terms of vulnerability reduction strategies and positive societal feedbacks (Alexander, 2000; Birkmann, 2007). Indeed, it can be argued that student housing is oriented in an "innocent" way by resource scarcity and resource distribution, that is a very well-known political issue that need to be integrated in the development of vulnerability reduction strategies (Wisner et al., 2003; Cannon, 2008). This opens more interrogatives in terms of the social responability of home owners, their role in the process and the relation of those dynamics with wider aspects of the local economy. Moreover, it can be considered that international and visiting students are "guests" in a hosting community where they cannot rely

on their pre-existing social networks, which has other implications in terms of integration and safety. More than half of the respondents to our questionnaire did not consider important to spend time looking for an adequate accommodation, even if they averagely moved one house every two years. This affects in different ways the development of good practices for implementing strategies of disaster reduction: the lack of consciousness about the specificities of the local context could increase vulnerability levels but decrease the overall knowledge about the area and the involvement in local networks. However, this could be addressed with the creation of good practices of community resilience. Students cannot be seen just as passive actors, but engaged to undertake an active role to share their experience and expertise at the local level (Imperiale and Vanclay, 2016). The definition of these steps in the preparedness phase acquires than wide implications if contextualised in the implementation of the Sendai Framework for Disaster Risk Reduction, which will be addressed in the next section.

5   CONCLUSIONS

The globalization of education and the mobility of students had strong consequences on the city planning and housing management. Despite the number of studies about this phenomenon, some aspects remained marginal in the literature, such as the perception of safety by students and possible vulnerability reduction strategies to undertake at the political level. In this paper, we integrated a quantitative dataset with some of the interdisciplinary literature on disaster risk reduction (Hewitt, 1995; Alexander, 2000; Wisner et al. 2003; Birkmann, 2007; Cannon, 2008; Miller 2012; Gaillard and Mercer 2013; Linkov et al., 2014), to derive new suggestions for policy makers. Our studies highlighted different results that can be used to support the implementation process of the UN Sendai Framework for Disaster Risk Reduction (UNISDR, 2015), at four different levels:

1. *Improvements in the general preparedness of the communities in which the students are hosted, with better education of the citizens but also the identification of specific needs of students as a vulnerable category*. The wrong behaviours of the students could reflect the status quo in the area, being associated with other contextual failures in the vulnerability reduction strategies of organizations such as the civil protection. However. students should also be better recognised

as a self-standing category to be considered in planning. This can be associated both with their scarce access to well-structured social networks, such as in the case of tourists, but also with their scarce availability of resources that can determine unsafe behaviours.

2. *Development in the administrative and educational support provided by the host institutions.* Practical actions, such as for example illustrative flyers, could be undertaken by the universities to decrease the existing vulnerability levels, increasing the likelihood of safe behaviours. This process should be contextualised in the local area to integrate information such as the risk levels, using the institutions as a possible mediator to facilitate the transfer of knowledge but also integrating tools such as social media.

3. *Involving students as proactive force for community resilience.* Although not permanently integrated in the local communities, students be active resource that could promote local resilience and should be supported by focused policies and actions at the local level. The process of student housing could be a chance to involve an active social force with its own potential, contributing to the developing safer practices in the existing local networks.

4. *Acknowledging and increasing the social responsibility of property owners and of local and civil protection authorities.* The contextualisation of student housing open interrogatives about the ethical and practical responsibility of agents such property owners and local authorities which should improve their commitment in terms of providing fair advice, training, providing information to the students, but also increasing the number and quality of safety controls on the buildings. This is clearly a substantial challenge that should be addressed at the policy level.

Figure 5 integrates these suggestions and the findings reported in the discussion into a framework based on the approach presented by Alexander (2000, 2005) and Wisner al. (2003), in terms of positive and negative feedbacks influencing disaster risk since the preparedness phase. Student housing can be subject to negative influences of variables such as low risk and safety awareness, increasing the potential impact of disasters in a certain community. However, the activation of positive feedbacks in the policy domain can transform its role increasing community resilience.
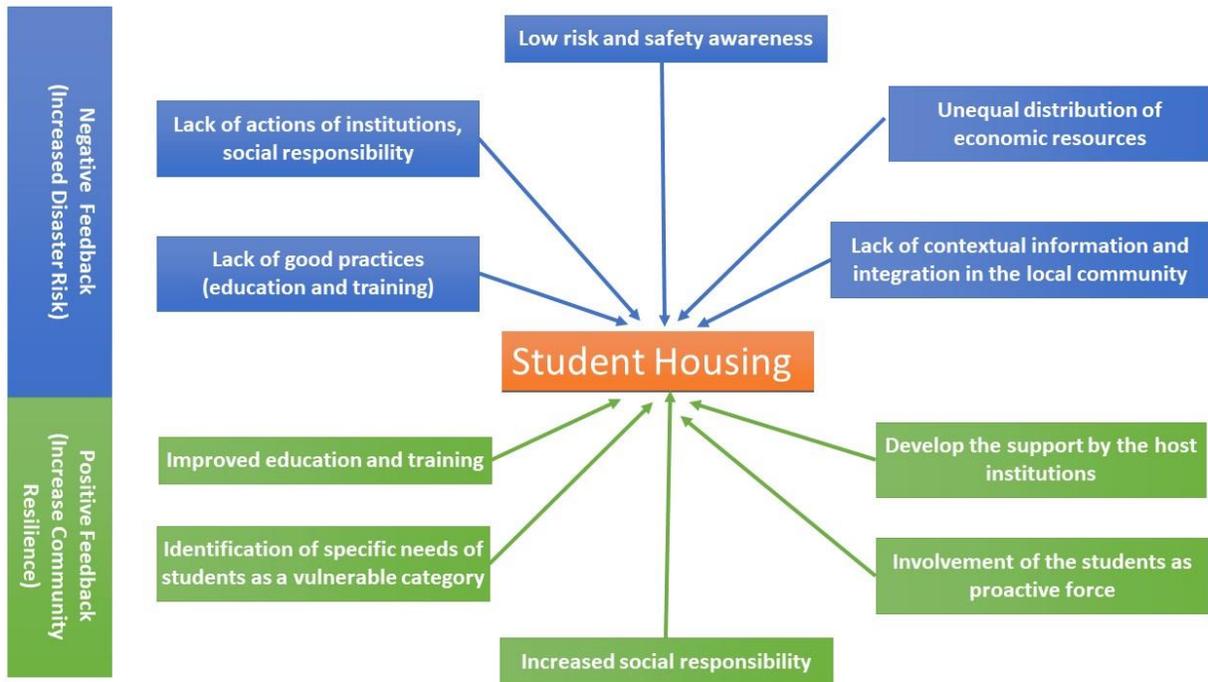
Figure 5: Positive and negative feedbacks on student housing and disaster risk.

In conclusion, our research provided a basic understanding of how students' risk perceptions could orient vulnerability reduction strategies. It must be noted that it does not pretend to be exhaustive, but it aims to stimulate a wider discussion about problems in safety and urban planning. We recognise the existence of many limitations, such a better integration with vulnerability indexes and contextual drivers, but these could be all elements to be addressed in the future researches. We must recognise that the questionnaire itself did not integrated for feasibility reasons somebroader issues such as the social responsibility of property owners and of local and civil protetion authorities. Although those elements were considered as part of the theoretical framework, it can be argued that more datesets should explore the correlations between risk perceptions and drivers of resilience for the possible applications of approaches such as the psychosocial capacity building (Miller, 2012). We would recommend the creation of a priority list for information that should be given to students to support a safer research of houses, as well as the better communication tools to do that. Moreover, it could be beneficial to target which of the students' decision-making process could be more critical for community emergency planning, activating proactive behaviours. To sum up, can be noted that the identification of the key factors of determining the decision of student housing decision is central to design efficient and efficacy policies, but further research is needed to find the adequate indicators to support the implementation of the Sendai

Framework. As suggested by UNISDR (2015) understanding better disaster risk is a central step in the implementation of effective policy making and further research on student housing could be a pivotal part of this process.

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ETHICAL STATEMENTS

Data collection and analysis were carried out following the policies adopted by the Università Politecnica delle Marche (UNIVPM). The questionnaire used for the data collection explicitly stated the scientific purpose of the study survey and on the use of data; Each responder provided verbal informed consent prior to participation and voluntarily decided whether to participate or not. The authors collected no identifying participant data. In the document we referred to the Italian national law DL 30-6-2003, n. 196, "Codice in materia di protezione dei dati personali" (Code for the Protection of Personal Data) considering that UNIVPM does not have a specific ethics committee for social research.

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