The fault lines within society; Assessing San Francisco’s resilience in the wake of the 1906 earthquake and fire

**Bachelor thesis BA History**

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**Abstract**

This study assesses the resilience of San Francisco in the wake of the earthquake and fire of 1906. Adopting the prevalent perspective of historical disaster studies, this study analyses society as a socio-economic system. Hence, employing the concepts of vulnerability and marginalization. The hypothesis is that marginalized communities will develop differently than the general population due the disaster. Thus, changing the composition of society, for instance, through forced migration. The focus is on the four largest immigrant populations (Irish, Italian, German and Chinese) in San Francisco. These subpopulations were more vulnerable as they suffered from the discriminative dynamics of the relief measures and rebuilding policy. The demographic developments that took place after the disaster, discernible from the 1900 and the 1910 census, show this marginalization had an enduring effect on the composition of society.

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# Introduction

## 1.1 A brief outline

The early mornings in San Francisco can be quiet. While the oceanside city sleeps it is typically covered in an eye easing, sound dampening fog. The geographical location, however, does more than bring about serenity. Moreover, on Wednesday April 18th of 1906 the young city experienced its least tranquil morning due to its geology. At 5:12 a.m. that particular early morning the citizens were abruptly woken by one of the most violent and destructive earthquakes ever to hit the United States of America. The disaster instantly became infamous. It hit the international headlines and inspired over eighty published titles before the year was out.[[1]](#footnote-1) The focus then, as now, was mostly on the geology,[[2]](#footnote-2) destruction and the immediate horrors suffered by its citizens.[[3]](#footnote-3) The subsequent attention on the reconstruction resulted in a dominant narrative of swift and thorough revival.[[4]](#footnote-4) Similarly, reconstruction attracted most of the scientific attention,[[5]](#footnote-5) although recently some nuances on the nature of its success have also been voiced.[[6]](#footnote-6)

Analysis of the disaster through a socio-economic perspective using the framework of resilience, such as is a focus in disaster studies, is, however, lacking. Tim Soens in his work on North Sea floods (2018) concludes that: *“…the many societies that witnessed renewed economic, social or cultural dynamics in the aftermath of a disaster, but at the same time saw a significant part of their population killed, bankrupted or forced to migrate, can no longer be labelled ‘resilient’.”*[[7]](#footnote-7) Essential is, thus, to recognize that resilience is a relative quality. For that reason the phoenix like success story of San Francisco begs a closer look. How inclusive was the recovery following the disaster actually? On an ever-busier populated planet, with an increase in natural hazards forecasted for the coming century, deeper understanding of disasters is more than welcome.[[8]](#footnote-8) The 1906 earthquake of San Francisco makes for an obvious case study. To that end, the aim of this bachelor thesis is to find out to what extent disparity characterized San Francisco’s resilience following the earthquake of 1906.

## 1.2 Framework & theory

The terms disaster and resilience deserve some closer consideration. It was the bisection of the term ‘natural disaster’ during the 1970s that initiated the development of socio-economic disaster studies.[[9]](#footnote-9) The natural and societal aspects of disasters were disentangled. The distinction was made between exogenous natural hazards (such as earthquakes) that pose risks to society and the endogenous traits inherent to society that determine whether they will actually suffer from these risks. Disasters, then, have a dualistic causation as natural hazards and disadvantageous societal characteristics are independent requirements.[[10]](#footnote-10) Subsequently, the characteristics of societies that suffer disasters have become a focal point of study. Described in the seminal work by Wisner et al. (1994) as “*the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard.”[[11]](#footnote-11)*

This perspective opened up a whole new array of questions. One pivotal element is implicit in the description of the characteristics given above. Namely, that the characteristics can be related to a single person or a group. Thus, it follows that there can be disparities in how vulnerability is distributed within society.[[12]](#footnote-12) Following these observations research in disaster studies took specific interest in the marginalized people within society. An interest in those who have a higher risk to suffer from natural hazards. Marginalized people are more at risk as they lack means to deal with natural hazards due to (economic) characteristics such as lack of recourses and poverty.[[13]](#footnote-13) Vulnerability is, however, not the same as poverty but rather defencelessness in a broader sense.[[14]](#footnote-14) A lack of social capital can similarly cause vulnerability.[[15]](#footnote-15) The enduring effects of vulnerabilities on society following the disaster at San Francisco are the focus of this paper. Thus, it sees on the last phase of the disaster, the recovery.[[16]](#footnote-16) The importance of the distinction between natural hazards and the societies that face them becomes more clear here. During the recovery the hazard has past but a society in crisis remains. How it copes, then, determines if, or, to what extent a disaster develops. During this phase resilience comes into play.

In short, resilience is a quality determined by whether or not a society is able to bounce back. Moreover, the word resilience is derived from *re-* and the Latin *salire*, which means to jump. The concept of resilience is used in various disciplines but originally gained academic repute in the analysis of ecosystems.[[17]](#footnote-17) The field of disaster studies readily adopted the concept giving it distinct meaning in the analysis of systems in an established socio-economic sense.[[18]](#footnote-18) Resilience remains, however, a complex concept due to the different interpretations it is given.[[19]](#footnote-19) Originally describing the recovery of a system to the status quo, more recently, societies that experience qualitative change due to disasters are deemed to display adaptive or transformative resilience.[[20]](#footnote-20)

As such, when defining resilience, it comes down to deciding to what extend mutations in society are allowed for. Implications are, for example, that given a chosen definition, mobility and migration might be indicators of resilience, or, rather, its absence.[[21]](#footnote-21) Showing either a coping mechanism or the crumbling of society. Hence, it is quintessential to consider resilience as a characteristic of society as a whole, but, also as an individual or subgroup trait. A fallacy of resilience frameworks is that they might obscure individual vulnerability.[[22]](#footnote-22) Infamous is the example of New Orleans, that paradoxically scored better on various metrics after hurricane Katrina pushed vulnerable people out.[[23]](#footnote-23) Assessing the presence of such transformative and adaptive processes during the recovery of San Francisco will help answer to what extent disparity coloured it’s society’s resilience.

## 1.3 Methodology

In order to accomplish said assessment, and, to find out to what extent disparity characterized San Francisco’s resilience, this paper will consecutively investigate two elements of the city’s recovery. Firstly, the second chapter will discuss the recovery activities. It will investigate to what extent the recovery process, and policies that guided that process, were discriminative. Was this process egalitarian, or, did it disproportionally strain the opportunities of some? If so, whom exactly, and in what way? The hypothesis is that an unequal distribution of vulnerabilities and opportunities during the recovery would have a lasting effect on society. Hence, showing that, although San Francisco bounced back, its resilience was not a feature shared throughout society. In order to answer the question posed in the second chapter, literature will be consulted as well as government reports, both contemporary and modern.

Secondly, the third chapter will discuss to what extent unequal distribution of chances and vulnerabilities during the recovery are reflected in demographic developments. Such developments will show whether disparity characterized the resilience shown by San Francisco. The demographic developments measure the effect of the discriminative recovery processes and policies discussed in the second chapter. In order to find these developments data from the 1900 and the 1910 census will be compared. San Francisco’s demographic development will be contrasted with that of Oakland and the Pacific region at large. Further on, more attention will be given to the exact nature of the census data. The temporal time frame, development up to 1910, fits neatly with lapsing of the functional recovery phase, and, is for that reason specifically suitable for this study. Substantiation on the phases of recovery is embedded in the in the analysis of the recovery activities in the second chapter, that follows hereafter.

# 2. Restoration and reconstruction

## 2.1 Introduction

Earthquakes pass quickly but have long aftermaths. In order to study that aftermath some knowledge of the instantaneous damage is required, as it creates the context in which resilience is later displayed. Furthermore, using a framework to divide the aftermath of the disaster into distinct phases is a prerequisite for accurate analysis. Differentiation between phases improves understanding of the disaster as it helps specify the focus, both in a temporal and a thematic sense. For that reason, after assessing the initial damage wrought by the hazard, this paper will explore the benefits of possible frameworks. The focus will be on the usefulness for identifying the unequal distribution of vulnerabilities and opportunities during the recovery. Thereafter, (sub)groups can be identified who were more vulnerable and, or, less well accommodated during the recovery. The subsequent analysis of the demographic developments of these marginalized groups, in the third chapter, will reveal the nature of San Francisco’s resilience.

## 2.2 The damage done

The scale of the damage suffered by San Francisco was unprecedented. Although San Francisco had barely existed half a century previous to the earthquake it had become the centre for trade on the pacific coast during the 19th century.[[24]](#footnote-24) It became the eighth largest city in the nation by the turn of the century.[[25]](#footnote-25) The populous city suffered like no other due its location, right on the San Andreas fault where the 7.7 magnitude earthquake occurred.[[26]](#footnote-26) Most of the destruction was wrought, however, by the subsequent fire. Unable to extinguish the fire for three days, over 28,000 buildings and roughly five square miles of land burned down.[[27]](#footnote-27) The total damage is estimated as high as $500 million, over 1 percent of the GNP.[[28]](#footnote-28) The loss of life was more than 3,000, according to conservative estimates.[[29]](#footnote-29) After the fire hazard passed over half the city was left homeless. Some 100,000 of these refugees set up camp in the ruined city.[[30]](#footnote-30) Months after refugees still remained camped in the golden gate park, often unable to identify their home, relying on breadlines for food.[[31]](#footnote-31) Optimism was, however, voiced. The business elite downplayed the damage in the news out of concern for future investment.[[32]](#footnote-32) Supposedly, the former mayor stated that the earthquake rendered “*nothing destroyed that cannot speedily be rebuilt.*”[[33]](#footnote-33)

## 2.3 Restoration and reconstruction of the destroyed for functional replacement

The prevalent framework in socioeconomic disaster studies is the Disaster Management Cycle (DMC), that distinguishes between pre- and post-disaster phases.[[34]](#footnote-34) Often, further sub-phases are identified. As argued by Singleton (2015), the distinction between pre- and post-hazard benefits the study of the relation between hazards and disasters.[[35]](#footnote-35) This thesis, however, adapts the framework proposed in the comparative study “*Reconstruction following disaster*,” by Haas et. al. (1977),[[36]](#footnote-36) which contains a compilation of many case studies, including San Francisco. This framework exclusively distinguishes between phases post-hazard, based on the nature of the ongoing recovery activities. Hence, its four phases vary in their relevance with regard to resilience. Therefore, this framework is specifically suitable for this study. It helps to identify the marginalized and demarcates the timeframe. Frameworks that identify phases reaching back to before hazards, or far beyond reconstruction, are indispensable for the betterment of communities resilience. A more narrow framework, however, is more to the benefit of this study.

The first phase of “*reconstruction following disaster*” concerns the emergency responses, the second the restoration of the restorable, the third the reconstruction of the destroyed for functional replacement and the fourth the reconstruction for commemoration, betterment and development.[[37]](#footnote-37) The distinction, as follows, is made based on the type of recovery activity carried out. The consecutive phases have the approximate duration of ten times as many weeks as the previous phase. The beginning and ending of certain type of recovery activities are, however, not necessarily abrupt and overlap with other phases. The first phase sees on the immediate dealings with the (natural) hazard, the fourth on what surpasses after the former status quo has been retained. The second and third phase see on recovering what was lost, these phases are the focus of this paper. During that time society might bounce back, re-establishing a socioeconomic system as was present before the disaster. As such, proving itself resilient. Absence of such development or alterations in the system, then, show the lack of resilience or, some might argue, transformative resilience.

Although San Francisco was damaged badly governmental institutions were quick to ensure order and start recovery activities. The national guard and army, joined by the navy on April 19th, divided the city into districts and started policing them.[[38]](#footnote-38) A committee of 50 (composed of business leaders) was appointed by the mayor to assume government on April the 18th.[[39]](#footnote-39) Subcommittees dealt with issues such as food aid, the Chinese community and evacuation.[[40]](#footnote-40) In early May, the committee was replaced by the committee of 40 for the rebuilding of San Francisco, the phase of emergency response had finished. All this time, the army provided food for some 350.000.[[41]](#footnote-41) During May and June regular life returned somewhat, banks reopened,[[42]](#footnote-42) family and neighbourhood encampments were redirected into official refugee camps,[[43]](#footnote-43) running water and electricity were restored and the phase of restoration activities came to a close.[[44]](#footnote-44) On July 1st, the troops retreated to their barracks.[[45]](#footnote-45) Conclusively, the second phase took around two to three months. The rebuilding thereafter took several years. The civic and business elite celebrated the retainment of the pre-disaster population in October 1909,[[46]](#footnote-46) to name one milestone. The Panama-Pacific International Exposition, celebrating a resurrected San Francisco, was hosted in December of 1915, to name another.

## 2.4 San Francisco’s societal structure

It is crucial to acknowledge that San Francisco did not experience the restoration and functional rebuilding phase as a homogenous entity. The resilience framework must not obscure individual vulnerability. Rather, recovery activities of discriminative character highlight where pressure on individuals and (sub)groups might have caused disparity in their ability to display resilience. During the phase of reconstruction of the destroyed for functional replacement it matters who decides what is functional, for example. Before the disaster it was observed that a great many “shanties” rented cheap in downtown neighbourhoods, thus, interfering with the incentive of landlords to improve on the buildings.[[47]](#footnote-47) The fire presented great opportunity to improve this. The early construction of temporary housing camps, that remained for years, removed the urgency of housing the homeless.[[48]](#footnote-48) Rebuilding, hence, progressed in a manner concurring with the private interest of the economic elite.[[49]](#footnote-49) Housing was not, however, the only aspect in which privilege played a role. For a complete appreciation of the unequal pressures the recovery activities induced, some understanding of the social-economic composition of San Francisco’s society is required.

What disaster means for broader society may not be true for a small group, and vice versa.[[50]](#footnote-50) Such is true in this case as well. The disaster did not only temporarily interfere with, but also affected the social and economic divides in San Francisco’s society. At the turn of the century over a third of the population was foreign born, and, another third was a second generation immigrant.[[51]](#footnote-51) Most immigrants came from Ireland, Germany, Italy and China. Close knit communities based on ethnic and racial backgrounds were embedded in the city.[[52]](#footnote-52) Immigration had caused rapid population growth,[[53]](#footnote-53) and, subsequent escalation in rents left no room for savings from a workers income.[[54]](#footnote-54) Whom were rendered extra vulnerable in that way, as those who just get by cannot spare recourses for future risk.[[55]](#footnote-55) The disaster initially seemed to have dissolved many divides of class and origin. Refugee camps and breadlines were shared by all. Issel and Cherny (1986) report that necessity inspired cooperation across former hierarchical and communal boundaries.[[56]](#footnote-56) At no point in time, however, were discriminative features fully absent. While the fires still burnt efforts were focused on the houses of the wealthy while Chinatown was left to its own fate.[[57]](#footnote-57)

Moreover, in multiple instances divides within society deepened as a result of relief policies. This century several nuances on the recovery have been voiced, most strongly, perhaps, by Davies (2012). She summarizes numerous discriminative measures: Relief camps segregated refugees based on race and gender, and, temporarily offered evacuation to those deemed undesirable;[[58]](#footnote-58) Relief money was distributed in accordance with the pre-disaster division of wealth;[[59]](#footnote-59) Social hierarchy was further re-established through an additional financial handout for (former) property owners; Native-born families and two-parents households received 80 percent of the budget.[[60]](#footnote-60) This concurs with the comments by Haas et. al. (1977), who state that the affluent retained their former living conditions by 1908, while getting by remained difficult for the less fortunate for years more.[[61]](#footnote-61) Correspondingly, Strupp (2006) notes that Western Europeans moved back into residential areas sooner compared to immigrants from southern Europe of Latin America.[[62]](#footnote-62) Moreover, many labourers employed in the reconstruction remained in the relief camps as rising rents outmatched their income.[[63]](#footnote-63) These findings support the conclusion that private interest guided the restoration and reconstruction. Exemplary, the Red Cross stimulated capitalistic practices through the sales of goods, one of the policies that fuelled criticism and protests from the inhabitants of the relief camps.[[64]](#footnote-64) With regard to these inhabitants, a closing remark on the Chinese community is specifically in order.

The disregard for Chinatown during the fire was not the only occurrence that set the Chinese apart. Other measures show how the Chinese were alienated, more so, even, than other immigrant communities. That initially only twelve Asian names were accounted for in the death count, although all of Chinatown burned down, speaks volumes.[[65]](#footnote-65) Competition for work fuelled racial hostility amongst labourers whilst the elite in the citizens committee spoke more of Chinatown’s real estate than its refugees.[[66]](#footnote-66) In fact, the Chinese refugees were moved repeatedly to prevent them from settling.[[67]](#footnote-67) The community, however, consolidated in response. Merchants developed an internal credit system.[[68]](#footnote-68) Even the Chinese government intervened, calling on Roosevelt to take action. The president responded by introducing anti-discrimination policy.[[69]](#footnote-69) After other cities began courting the Chinese merchant community, the Sub-Committee for Permanent Relocation of Chinatown finished negotiations. Chinatown could be rebuilt where it had stood, in the city centre. Moreover, negotiations had strengthened and formalized relations between the Chinese community and the city.[[70]](#footnote-70) Interestingly, the Chinese stand out for being targeted specifically by discriminative measures and for internal organization of the community. Clearly marginalized, the question arises whether their communal bonds benefitted their ability to display resilience.

## 2.5 Conclusion

Firstly, this chapter examined the damage inflicted by the earthquake and fire. Secondly, discriminative features during the restoration and functional recovery phase were identified. Conclusively, the immigrant poor were identified as being marginalized. Notably, two thirds of the frontier city was foreign or had foreign born parents. Multiple authors found that segregation was an integral part of the relief operations. Concurring with the consensus that the private, economic interest of the elite guided the recovery. Although the initial hazard might have eradicated the fault lines in society, the egalitarian nature of the homeless society waned within weeks. Relief measures distinguished between affluent and poor, native-born and foreigners. Hence, the marginalized immigrant communities harboured within San Francisco’s society provide a distinct focus group. The four most populous communities, the Irish, Italian, German and Chinese will be examined in this study. Demographic development will show whether their resilience suffered from the discriminative features of the recovery. Evident is that these discriminative measures distributed push and pull factors unequally amongst the population during the recovery. It is in that way that disasters can inflict the most enduring effects.[[71]](#footnote-71)

# 3. San Francisco four years later

## 3.1 Introduction

Now that the context of the disaster is given, an assessment of the resilience displayed by San Francisco is in order. The central question posed is, whether society was able to overcome the impact of the hazard and re-establish itself. As stated above, the bustling city regained its former population size by the end of 1909. For resilience, however, more is required. The socio-economic system such as existed has to prove impervious to the stress induced by the (natural) hazard, the earthquake and fire in this case. For that reason, the focus is on those within society whom are more vulnerable. Therefore, in what follows, the demographic developments of first-generation immigrants will be examined. The numerous foreign born migrants were more likely to work unskilled jobs and be poor.[[72]](#footnote-72) Lacking social and economic capital they form clear marginalized groups. Obviously, interaction between first- and second-generation immigrants, specifically of similar heritage, would occur. Moreover, all immigrants need not be poor per se. Generalizing is, however, a prerequisite for the assessment of resilience through demographic developments. Hence, the immigrants with the four most common nationalities form the best-defined objects of study.

## 3.2 The data

The data used to study the demographic developments is derived from the 1900 and the 1910 US Census. The decennial census is mandated by the constitution and used to apportion representatives in accordance to population size. During the 19th century the census came to include additional questions in order to monitor demographic and economic development. Hence, this longitudinal survey is a research design suitable for studying the development of the similar variables. Demographic variables of the city of San Francisco in this case. The microdata (individual response data) is made available through the Integrated Public Use Microdata Series (IPUMS).[[73]](#footnote-73) IPUMS is part of the Institute for Social Research and Data Innovation at the University of Minnesota, relying on donations and government funding.[[74]](#footnote-74) The organization uniformized, coded and digitized the microdata, enabling full employment of the wealth of information originally collected by the census agents, whose inquiry concerned all persons related to the place they live and sleep most of the time.[[75]](#footnote-75)

The data is a weighted or representative, five percent sample from the total population. The data, as such, resembles a miniature of the population from which it is drawn.[[76]](#footnote-76) Subsequently, slight variations due to rounding up may deliver results different from exactly 100 percent. This goes for all three geographical entities involved in this study. For San Francisco and Oakland the study encompasses their contemporary city boundaries. The Pacific Division includes the states Alaska, California, Hawaii, Oregon and Washington as mapped in 1990. The comparison is with the other two geographical entities especially. Oakland provides an example of another nearby city. Given its size it was the only other city in California at the time for which localized data is available. Similar to San Francisco, Oakland was a frontier city that attracted immigrants and was situated in the bay area. Although, it did experience the tremors of the earthquake and housed refugees, it did not suffer significant destruction.[[77]](#footnote-77) Accordingly, it shows how demographic trends developed unaffected by the disaster. Secondly, the comparison is drawn with the Pacific Division, opposed to California. San Francisco being the largest city, accounts for a large proportion of the state’s data. Taking the Pacific Division, the larger frontier, creates more discernible differences between San Francisco and the region at large, otherwise more skewed.

A note, on the temporal demarcation, is also in order. The census was concluded in 1900, six years prior to the earthquake and fire. Some alterations in the composition of society may have developed during that time. Overall, however, during these years population grew and the influx of immigrants continued.[[78]](#footnote-78) Similar to the developments in Oakland and in the Pacific Division. Yet, the six-year gap has important implications. Would the demographic representation of some features or people, for example, decrease between 1900 and 1910, one should realize the actual decrease since 1906 would be much larger. The meaning of such developments is, thus, amplified.

## 3.3 Nativity

**Table 1: The nativity of the population as a percentage of the total**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **San Francisco** | | **Oakland** | | **Pacific Division** | |
| **1900** | **1910** | **1900** | **1910** | **1900** | **1910** |
| **Parents native** | 20.8% | 24.2% | 32.0% | 32.3% | 44.9% | 45.4% |
| **Parent foreign** | 7.8% | 10.0% | 8.5% | 9.2% | 7.7% | 7.8% |
| **Parents foreign** | 25.7% | 23.0% | 19.9% | 19.6% | 14.9% | 13.5% |
| **Born foreign** | 45.8% | 42.8% | 39.6% | 39.0% | 32.5% | 33.3% |

Table 1 shows the nativity of the population for San Francisco, Oakland and the Pacific Division. In the late 19th century and early 20th century the pacific coast was the western frontier of the United States and attracted many immigrants, this is clearly visible in the data. In San Francisco only about 20 percent of the population had native-born parents. Important to note is, that the role of the pacific coast in the migration system within the United States remained the same throughout the decennium.[[79]](#footnote-79) This too is visible in the data. Only very slight proportional differences develop during the decade. For Oakland and the Pacific Division combined the average change in percentage per category is 0.5. In San Francisco the development is much larger. The average change in percentage of nativity for San Francisco is 2.8. That is more than 5 times as large as the average seen in Oakland and the Pacific Division. Strikingly, the shift in the nativity of San Francisco favours the native-born over those with either both or one parents born domestically. Moreover, the effect is most pronounced for the foreign-born themselves and those with two native parents. The immigrant population apparently decreased or failed to grow as much as the other subpopulations. This development becomes more tangible when the demographic development of specific immigrant communities is examined.

**Table 2: The four largest immigrant nationalities as a percentage of the total population and their total number**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **San Francisco** | | **Oakland** | | **Pacific Division** | |
| **1900** | **1910** | **1900** | **1910** | **1900** | **1910** |
| **Irish** | 10.5% | 7.5% | 9.2% | 5.3% | 4.2% | 2.3% |
| 26056 | 25993 | 4154 | 5822 | 66607 | 83816 |
| **Italian** | 3.4% | 4.3% | 2.1% | 4.9% | 1.5% | 2.5% |
| 8442 | 14856 | 930 | 5318 | 23228 | 81754 |
| **German** | 10.1% | 7.2% | 5.3% | 6.4% | 5.7% | 4.1% |
| 25092 | 24961 | 2413 | 7019 | 91717 | 130865 |
| **Chinese** | 4.0% | 2.8% | 1.3% | 2.0% | 3.1% | 1.6% |
| 9918 | 9735 | 574 | 2203 | 50003 | 50848 |

In Table 2 the demographic development of the four largest immigrant groups of San Francisco is shown. Accompanied, again, by the development for these nationalities in Oakland and the Pacific Division as a whole. The table represents those whom were born in that country themselves, first-generation immigrants. The percentage shows what part of the total population is an immigrant with that specific origin.

For San Francisco this percentage decreases for all nationalities, except for the Italians. This is, however, not surprising as the number of Italians in the Pacific Division grew roughly 4 times over during the decade. Knowing this, and, compared to the almost 600 percent increase in Oakland, the 76 percent increase of Italians in the disaster struck city appears meagre. That these other immigrant groups came to represent a smaller proportion of society implies that, either, their growth was impeded, or they left the city in relatively higher numbers, or both. However, the percentual decrease is not the most meaningful information observable in this table. More impressive is the decrease of the total number of these immigrants in the city (with the exception for the Italians). Bear in mind, San Francisco experienced further growth over the years between 1900 and the disaster in 1906. Thus, the fact that the total size of these immigrant populations decreased is remarkable.

Another contrast appears evaluating San Francisco’s role as main destination for immigrants in the Pacific Division. The number of immigrants with these nationalities living in San Francisco as a percentage of the total population of immigrants with that nationality in the region decreased sharply. Whereas 39.1 percent of the Irish in the pacific region called San Francisco home in 1900, that was only true for 31.0 percent in 1910. In 1900, 36.3 percent of the Italians and 27.4 of the Germans lived in San Francisco. By 1910 the subsequent numbers had dropped to 18.2 and 19.0 percent. The exception in this trend is made by the Chinese, of whom 19.8 percent lived in San Francisco in 1900 and 19.2 percent in 1910. Interestingly, the Chinese were also the only immigrant population in the Pacific Division not to experience significant growth throughout the decade. Neither did their numbers decrease as much as the Irish and Germans in San Francisco. More on the exceptional character of the Chinese immigrant population will follow. It differs distinctly from that of the European immigrants. Hereafter, comments on the Chinese will be reserved for a dedicated analysis of their subpopulation specifically.

The decrease of the immigrant populations size has two possible explanations. Theoretically, it is possible that immigrants left the city after 1900 but prior to the disaster. However, the fact that there was a continued influx of immigrants during the decade for the entire region and San Francisco itself experienced further growth up to 1906 contradicts this view.[[80]](#footnote-80) Moreover, suggesting outward migration decreased population size prior to the earthquake is ridiculous as it has no foundation in reality and contradicts all existing research. Irrefutably, then, Table 2 proves outward migration of the immigrants after the earthquake. A development not directly apparent for the native-born population, given the overall decennial population growth of San Francisco. Assuming the population of Italian immigrants grew up to 1906 at a somewhat similar speed as in Oakland and the Pacific Division, outward migration post disaster occurred in their subpopulation too. Even though this is not instantly apparent from the comparison with the data from 1900. The difference between the development of the immigrant populations and the native-born citizens becomes starker still when looking at the composition of these populations.

## 3.4 The composition of the immigrant population

**Table 3: The marital status of immigrants in San Francisco**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Irish** | | **Italian** | | **German** | | **Chinese** | | **Native-born** | |
| **1900** | **1910** | **1900** | **1910** | **1900** | **1910** | **1900** | **1910** | **1900** | **1910** |
| **Married, spouse present** | 44.0% | 38.6% | 62.2% | 58.8% | 57.8% | 53,0% | 11.3% | 8.3% | 39.2% | 39.6% |
| 11690 | 10041 | 5255 | 8729 | 14248 | 13235 | 1122 | 806 | 52782 | 78939 |
| **Married, spouse absent** | 3.9% | 3.5% | 4.7% | 5.4% | 4.3% | 4,4% | 49.4% | 55.6% | 4.9% | 4.3% |
| 1004 | 903 | 393 | 805 | 1082 | 1103 | 4900 | 5416 | 6573 | 8522 |
| **Single, not married** | 52.1% | 57.9% | 33.1% | 35.8% | 37.9% | 42,6% | 39.3% | 36.1% | 55.9% | 56.1% |
| 13363 | 15049 | 2795 | 5322 | 9762 | 10623 | 3897 | 3513 | 75315 | 111941 |

Table 3 splits the immigrant population according to their marital status, a metric that has been measured by the census for over a century. The categories are self-explanatory.[[81]](#footnote-81) Again, the percentual changes within the immigrant populations are larger and contrary to that of the native-born. Significantly, also again, there is a decrease in absolute terms. The amount of married immigrants decreases. The Italians, naturally, form the exception. Although, percentagewise, they too follow this trend. Contrary to the immigrant populations, the married native-born segment of the population experiences both absolute and percentual growth over the decennium. The building-aid relief fund that was discriminately supportive of married native couples springs to mind. Interestingly, within the “Single, not married” segment, the European immigrants do experience growth over the decennium. The previous presented data showed that the disaster put more stress on the immigrants than on the native-born within society. Similarly, Table 3 suggests that the division of vulnerabilities and opportunities within the immigrant populations was also heterogeneous and unlike those within the native-born population. This conclusion is supported by additional data.

**Table 4: The division of gender within the immigrant populations of San Francisco**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Irish** | | **Italian** | | **German** | | **Chinese** | | **Native-born** | |
| 1900 | 1910 | 1900 | 1910 | 1900 | 1910 | 1900 | 1910 | 1900 | 1910 |
| **Male** | 48.9% | 52.1% | 63.9% | 69.6% | 59.3% | 60.6% | 90.7% | 90.7% | 50.9% | 52.3% |
| 12733 | 13545 | 5392 | 10340 | 14878 | 15135 | 8994 | 8829 | 68565 | 104306 |
| **Female** | 51.1% | 47.9% | 36.1% | 30.4% | 40.7% | 39.4% | 9.3% | 9.3% | 49.1% | 47.7% |
| 13323 | 12448 | 3050 | 4516 | 10214 | 9826 | 925 | 906 | 66105 | 95096 |

Table 4 shows gender composition of the immigrant populations. Noteworthy, for both the immigrants and the native-born populations and increased amount of males is visible. Looking at the development in absolute terms, however, the immigrant populations do distinguish themselves from the native-born. The male share of the population increased during the decennium, whilst the female share decreased. Considering the growth up to 1906, the disaster possibly produced a decreased male population as well. Similarly, taking into account the growth up to 1906, the Italian population likely had similar experiences. Regardless, apparent is that the disaster spelled something else for immigrant men than for women. Whether the unequal distribution of fortune inspired less outward migration for the men or whether their dwindling numbers were compensated by new immigration post-disaster is not discernible from the data. Given the discriminative features of the relief and the required labour force during the restoration and functional rebuilding phase it seems likely both occurred to some extent. Nonetheless, the undebatable conclusion stands that this development separates the European immigrants from the native-born.

**Table 5: The division of gender within the population of single / unwed, young, adult immigrants in the San Francisco (18-30)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Irish** | | **Italian** | | **German** | | **Chinese** | | **Native-born** | |
| 1900 | 1910 | 1900 | 1910 | 1900 | 1910 | 1900 | 1910 | 1900 | 1910 |
| **Male** | 51.1% | 80.6% | 80.8% | 93.6% | 58.5% | 89.3% | 97.6% | 100.0% | 56.5% | 58.7% |
| 1338 | 2906 | 1161 | 2913 | 1417 | 2505 | 807 | 1101 | 27001 | 38318 |
| **Female** | 48.9% | 19.4% | 19.2% | 6.4% | 41.5% | 10.7% | 2.4% | 0.0% | 43.5% | 41.3% |
| 1279 | 701 | 276 | 200 | 1004 | 300 | 19 | 0 | 20802 | 26987 |

The final table discussed here (Table 5), provides insight into the development of increased gender disbalance within the immigrant population. The data concerns those who are unwed and 18 to 30 years old. Clearly, the increased disbalance in the division gender within the immigrant population is far more outspoken for the young, unwed adults. Again, this development separates the European immigrants from the native-born population. For the immigrants, the increase of males is substantial, both percentual and absolute. Remarkably, while the total population of Irish shrank during the decennium the portion of young, unwed men more than doubled in size. This increase outsizes even the total growth of the amount of Irish men (shown in Table 4), likewise for the Germen population. Most revealing is, perhaps, the decline in Italian young, unwed females in absolute terms, considering the enormous influx of Italian immigrants during the decade. Notably, the trend declines as the age bandwidth is increased up. Decisively, the data proves far reaching alterations in the composition of the immigrant populations, separating them from the native-born population.

## 3.5 The exceptional Chinese

The foregoing omission of analysis of developments within the population of the Chinese immigrants serves a purpose. Due to the difference to their European counter parts, attention dedicated specifically to their subpopulation is more suitable. The total size of the Chinese population is quite constant, both in San Francisco and in the Pacific Division. Also, the composition of their society remains similar, sharply distinct from the European immigrants. Half the Chinese population is married but lives in absence of their spouse. Also, nine out of ten of them are men, a statistic that is true in 1910 as much as in 1900. Moreover, there are nearly no young unwed females present at all. That there were actually zero of such women in 1910, as appears in Table 5, seems unlikely but it is not impossible. The census might miss an individual and doesn’t count visitors.

As for the men of Chinese birth, they competed for low skilled labour, same as the European immigrants.[[82]](#footnote-82) However, Chinatown also represented the centre of economic relations with China. It was the foremost harbour for import and export across the pacific. Still, the Chinese population of San Francisco was subject to vile racism before, and, especially after the disaster. The Sub-Committee for Permanent Relocation of Chinatown stands example of contemporary sentiment. However, other examples account of the strength of the inward orientated community. Such as, the interference of the Chinese government and the development of a credit system, internally used in the community.[[83]](#footnote-83) The wealth of the Chinese merchants benefitted the community. Furthermore, their importance was recognized and prevented the removal of Chinatown.

Conclusively, the Chinese stand out for being targeted specifically by discriminative measures and for the internal organization of the community. Although, more visibly marginalized than the other immigrants, the absence of demographic developments as seen with their European counter parts strongly suggests that they benefited from their communal bonds and the economic value the represented for the United States. The Chinese display of resilience is unmatched by that of the other three immigrant populations. Accordingly, the final part of this chapter only concerns the European immigrants, for whom an wholly different conclusion is apparent.

## 3.6 San Francisco’s societal structure four years later

The data convincingly shows different trends for and within the population of immigrants compared to the native-born population of San Francisco. These developments can be linked to the disaster of 1906 since they do not compare to what happened in Oakland or in the Pacific Division. Moreover, the demographic development in these two geographical entities is more similar and less pronounced than in disaster-struck San Francisco. The most pronounced developments are visible for the first-generation immigrants, whom were hypothesized to be most suspectable to the adverse effects of the unequal distribution of vulnerabilities and opportunities. They produce the most tangible evidence that a general resilience framework would obscure individual vulnerabilities.

Some caution is warranted while contemplating or inducing causal relationships from historical data.[[84]](#footnote-84) Such caution, however, is wavered in this case by the decreasing size of the immigrant (sub)populations in absolute sense. Taking into account the influx of immigrants and population growth up to 1906 in San Francisco and continued growth in Oakland and the Pacific Division, the role of the disaster becomes undeniable. Proving what might seem obvious. That the disaster of 1906 sorted effect in the demographic development of San Francisco is undebatable, causality is certain. Hence the question rises what the extent and the nature of the impact made by the disaster was. In that regard, the data proves insightful. Moreover, the fact that further population growth continued up to 1906 amplifies the meaning of the differences found between the absolute numbers of the 1900 and the 1910 census. The dominant narrative of rapid reconstruction obscured vulnerabilities. Similarly, looking at the data, the overall population growth, at first sight, obscures the developments.

Yet, the data clearly reflects the unequal division of vulnerabilities and opportunities during the restoration and functional rebuilding phase. The disaster induced stress or pressure, that was distributed unevenly throughout society. The large immigrant subpopulations were hit harder. Their numbers decline. The total amount decreases, and they form a smaller proportion of the total population. Moreover, the pressures they faced were of a different kind than those of the general population. The discriminative nature of the relief operations ensured this. The composition of the immigrant population changes more rapidly than and contrary to the development seen in the native-born population. These findings make sense, given the vulnerabilities typical of first-generation immigrants venturing to the frontier cities. Often in search of blue-collar labour,[[85]](#footnote-85) lacking skills, social capital, financial reserve and facing prejudice, discrimination and outright racism.

Clearly, outward migration characterized the response of the immigrant populations to the disaster more than the native-born citizens. In that way, showing that disparity characterized the resilience displayed by San Francisco. The extensive relief and rebuilding programme following the disaster as well as the reattainment of pre-disaster population size within three years is an impressive accomplishment. An accomplishment, however, that cannot be described as inclusive. San Francisco came to play a different role within the pacific region. Its role as centre for immigrant migration in the frontier declined. Many immigrants left the city too. The vulnerability of the immigrants becomes most evident here. The developments in the composition of the immigrant populations further separate them, distinctly, from the native-born citizens. It appears that young, male labourers had more opportunities, allowing them to stay or return. Phrased more truly, perhaps, stating they suffered a little less from the vulnerabilities shared throughout their immigrant community.

Concerning the labour market, a final remark on the increasingly skewed division of gender is required. The immigrant population was more receptive for the pressures induced by disaster. Discriminative relief measures further ensured they had less chance to successfully face the challenges presented to them. Additionally, the function immigrants fulfilled within society, as blue-collar labourers, ensured the economic laws at play during the reconstruction had more pronounced effect on their population than on the general society. Especially the women seem to have lost out. It shows the effect the faith in a quick return to capitalistic practices had. Unwed women were expected to find employment in the labour market similarly as they had before the disaster.[[86]](#footnote-86) However, few household jobs remain when the houses disappear. The destruction of 1906, in that way, created labour for men but diminished it for young, unwed immigrant women. This inequality invoked by the disaster is reflected in the data. In this way too the unequal distribution of vulnerabilities and opportunities sorted lasting effect.

# 4. Conclusion

Conclusively, San Francisco witnessed renewed economic and social dynamics in the aftermath of the disaster. It did not, however, retain the dynamics that existed prior. The demographic development of the immigrant populations prove this. Given the outward migration and the changed composition of society, San Francisco cannot be labelled resilient. This has implications for how post-disaster San Francisco should be viewed. Discriminative measures and private interest distinctly shaped relief policy during the restoration and functional reconstruction phase of the recovery. The importance of these dynamics as instigators of further marginalization should be acknowledged. A transformative process took place, in which the marginalized lost out. As a result, society did not bounce back as a homogeneous entity. Rather, disparity characterizes the resilience displayed. Grand, comprehensive narratives of San Francisco regaining economic and population growth after the disaster do not do justice to the varying developments that occurred along the fault lines within its society.

These findings concur with the existing historical literature on disasters. Disaster is shown inducing further marginalization, causing enduring change within society. Moreover, immigrants are shown to be specifically vulnerable. Establishing nativity as a characteristic deserving consideration during the analysis of disaster. Additionally, the female gender is found to be a characteristic inducing vulnerability. A finding corresponding with the established consensus. Interestingly, the findings support the theory that vulnerability is often derived from a combination of characteristics. This study found, after all, the most pronounced deviating development for young, adult, female immigrants.

The exact meaning of the outward migration and developments within society deserve further study. Considering that San Francisco was a frontier city makes that migration might have had a different meaning than in other circumstances. High geographical mobility was typical of the American west,[[87]](#footnote-87) especially for first-generation immigrants like the Irish and German.[[88]](#footnote-88) Having to leave home is disastrous. However, for those who plan only to stay somewhere for a limited duration and own little but the body with which they labour, migration might be less horrific than for a farmer leaving his hereditary lands. Disaster is, in the end, always experienced at an individual level, a perspective not employed in this study. Hence, further research on the personal experience of migration, dealing with loss and the labour market, using a different method, is desirable. Research which the marginalized, no doubt, deserve.

# Bibliography

## Sources

Census Bureau, *Supplement for California: Populatuon, Agriculture, Manufactures, Mines and Quaries*, (The 1910 Census Report). Retrieved from: https://www2.census.gov/library/publications/decennial/1910/abstract/supplement-ca.pdf.

Greely, Adolphus W. *Earthquake in California April 18, 1906; Special Report of Maj. Gen. Adolphus W.* *Greely*. Washington: Government Printing Office, 1906. Retrieved from: https://searchworks.stanford.edu/view/3228414.

Jordan, David Starr, ed., “*The California Earthquake of 1906*.” San Francisco: Bruce Brough Press, 1907.

Lawson, Andrew C., A.O. Leuschner, G.K. Gilbert, George Davidson, H.I.T. Reid, Charles Burkhalter, J.G. Branner and W.W. Campbell. *“The California Earthquake of April 18, 1906: Report of the State Earthquake Investigation Commission, vol. 1-2, Washington.”* Washington D.C.: Carnegie Institution, 1910.

Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas and Matthew Sobek. IPUMS USA: Version 10.0 [dataset]. Minneapolis, MN: IPUMS, 2020. https://doi.org/10.18128/D010.V10.0

The Times. “The San Francisco earthquake; Ravage of the flames, city practically destroyed.” *The Times,* April 20, 1906.

## Literature

Ackley, Laura A. *San Francisco's Jewel City: The Panama-Pacific International Exposition of 1915*. Berkeley: Heyday, 2014.

Blaikie, Piers and Harold Brookfield. *Land Degradation and Society.* London: Methuen, 1987.

Adger, William Neil. Social and ecological resilience: are they related?” *Progress in Human Geography* 24, No. 3 (2000): 347–364.

Béné, Christophe, Derek Headey, Lawrence Haddad and Klaus von Grebmer. “Is resilience a useful concept in the context of food security and nutrition programmes? Some conceptual and practical considerations.” *Food Security: The Science, Sociology and Economics of Food Production and Access to Food* 8, No. 1 (2016): 123-138.

Census Bureau. “Residence rule.” Accessed June 1st, 2020. https://www.census.gov/programs-surveys/decennial-census/2020-census/about/residence-rule.html

Chambers, Robert. “Vulnerability, Coping and Policy.” *IDS Bulletin* 20, No. 2 (1989): 1-7.

Coetzee, C. and Van Niekerk. “Tracking the evolution of the disaster management cycle: A general system theory approach.” *Jàmbá: Journal of Disaster Risk Studies* 4, No. 1 (December 2012): 1-9.

Endfield, Georgina H. “The Resilience and Adaptive Capacity of Social-environmental. Systems in Colonial Mexico.” *Proceedings of the National Academy of Sciences of the United States of America* 109, No. 10 (March 6, 2012): 3676-3681.

Davies, Andrea R. *Saving San Francisco:* *Relief and Recovery after the 1906 Disaster*. Philadelphia: Temple University Press, 2012.

Deryugina, Tatyana, Laura Kawano and Steven Levitt. “The Economic Impact of Hurricane Katrina on its Victims: Evidence from Individual Tax Returns.” *American Economic Journal: Applied Economics* 10, No 2 (2018): 202-233.

Ferrie, J.P. “The end of American exceptionalism: occupational and geographic mobility in the U.S., 1850–2000.” *Journal of Economic Perspectives* 19, no. 3 (2015): 199–215.

Fradkin, Phillip L. *The Great Earthquake and Firestorms of 1906: How San Francisco nearly destroyed itself.* Berkeley: University of California Press, 2005.

Godfrey, Brian J. “Urban Development and Redevelopment in San Francisco.” *Geographical Review* 87, No. 3 (1997): 309-333.

Haas, J. Eugene, Robert W. Kates and Martyn J. Bowden. *Reconstruction Following Disaster*. Cambridge, Massachusetts: MIT Press, 1977.

Hansen, Gladys, Richard Hansen and William Blaisdell. *Earthquake, Fire & Epidemic: Personal Accounts of the 1906 Disaster*. San Francisco: Untreed Reads Publishing, 2013.

Hawkins, Robert L. and Katherine Maurer. “Bonding, Bridging and Linking: How Social Capital Operated in New Orleans following Hurricane Katrina.” *British Journal of Social Work* 40 (2010): 1777–1793.

Holling, C. S. “Resilience and Stability of Ecosystems.” *Annual Review of Ecology and Systematics* 4, No. 1 (November 1973): 1-23.

International Monetary Fund - Fiscal affairs department, *Dealing with Increased Risk of Natural Disasters: Challenges and Options*, by Michael Keen, Paul K. Freeman, Muthukumara Mani. WP/03/197, IMF Working Paper, October 2003.

Institute for European Environmental Policy, *Climate change and natural disasters: Scientific evidence of a possible relation between recent natural disasters and climate change,* by Jason Anderson & Camilla Bausch. IP/A/ENVI/FWC/2005-35, Policy Brief for the EP Environment Committee, January 25, 2006.

IPUMS. “What is ipums.” Accessed June 1st, 2020. https://ipums.org/what-is-ipums.

Issel, William and Robert W. Cherny. *San Francisco, 1865–1932: Politics, Power, and Urban Development*. Berkeley: University of California Press, 1986.

Kroll-Smith, Steve and Shelly Brown-Jeffy “A Tale of Two American Cities: Disaster, Class and Citizenship in San Francisco 1906 and New Orleans 2005.” *Journal of Historical Sociology* 26, No. 4 (December 2013): 527-551.

Kurzman, Dan. *Disaster! : The Great San Francisco Earthquake and Fire of 1906.* New York: William Morrow, 2001.

Maskrey, Andrew. *Disaster mitigation: a community based approach*. Oxford: Oxfam, 1989.

National Oceanic and Atmospheric Administration, *A study of earthquake losses in the San Francisco Bay Area - Data and Analysis*. A report prepared for the Office of Emergency Preparedness: U.S. Department of Commerce, 1972.

Odell, Kerry and Marc D. Weidenmier, “Real Shock, Monetary Aftershock: The 1906 San Francisco Earthquake and the Panic of 1907.” *The Journal of Economic History* 64, No. 4 (December 2004): 1002-1027.

O’Keefe, Phil, Ken Westgate and Ben Wisner, ‘Taking the naturalness out of natural disasters’, *Nature* 260 (April 15, 1976): 556-557.

Pan, Erica Y. Z. *The Impact of the 1906 Earthquake on San Francisco’s Chinatown*. New York: Lang 1995.

Pelling, Mark. *The Vulnerability of Cities : Natural Disasters and Social Resilience.* Hoboken: Taylor and Francis, 2012.

Phillips, Ronnie J. “Coping with financial catastrophe: the San Francisco clearinghouse during the earthquake of 1906.” *Research in economic history* 21 (2003): 79-104.

“San Francisco one year later.” The Museum of the City of San Francisco. Accessed May 5, 2020, http://www.sfmuseum.org/hist11/sfoneyearlater.html.

Singleton, John. “Using the disaster cycle in economic and social history.” in *Crises in economic and social history.* Edited byA.T. Brown, Andy Burn and Rob Doherty, 53-78. Woodbridge: The Boydell Press, 2015.

Siodla, James. “Razing San Francisco: The 1906 disaster as a natural experiment in urban redevelopment.” *Journal of Urban Economics* 89 (2015): 48–61.

---. “Clean slate: Land-use changes in San Francisco after the 1906 Disaster.” *Explorations in Economic History* 65 (July 2017): 1-16.

Sjoberg, Gideon. “Disasters and Social Change.” in *Man and Society in Disaster*. Edited by George W. Baker and Dwight W. Chapman. New York: Basic Books, 1962.

Steele, Rufus. *The City that is: The Story of the Rebuilding of San Francisco in Three Years*. Whitefish: Kessinger Publishing, 2010.

Steinberg, Ted. *Acts of God: The Unnatural History of Natural Disaster in America*. New York: Oxford University Press, 2006.

Stewart, James I. “Migration to U.S. frontier cities and job opportunity, 1860–1880.” *Explorations in Economic History* 49 (2012): 528–542.

Strupp, Christoph. “Dealing with Disaster: The San Francisco Earthquake of 1906.” Symposium: San Francisco Earthquake 1906, Urban Reconstruction, Insurance, and Implications for the Future. Institute of European Studies. University of California at Berkeley (March 22, 2006): 1-44.

Thomas, Gordon and Max-Morgan Witts *Earthquake: the destruction of San Francisco*. Triptree: The Anchor Press, 1981.

Vale, Lawrence J. and Thomas J. Campanella *The Resilient City : How Modern Cities Recover from Disaster*. Oxford: Oxford University Press, 2015.

Walker, Thomas R. “Economic Opportunity on the Urban Frontier: Wealth and Nativity in Early San Francisco,” *Explorations in Economic History* 37 (2000): 258–277, doi:10.1006/exeh.2000.0740.

Walker, Brian, C S Holling, Stephen R Carpenter & Ann Kinzig. “Resilience, Adaptability and Transformability in Social–ecological Systems.” *Ecology and Society* 9, No. 2 (December 2004).

---, Piers Blaikie, Terry Cannon and Ian Davis. *At Risk; natural hazards, people’s vulnerability and disasters*. Trowbridge: The Cromwell Press, 2004.

Wisner, Ben and Henry R. Luce, “Disaster vulnerability: Scale, power and daily life,” *GeoJournal* 30, No. 2 (1993): 127-140.

1. “The San Francisco earthquake; Ravage of the flames, city practically destroyed,” *The Times,* April 20, 1906; Davies, *Saving San Francisco*, 4. [↑](#footnote-ref-1)
2. Jordan, ed., *The California Earthquake of 1906*; Lawson et al., *The California Earthquake of April 18, 1906.* [↑](#footnote-ref-2)
3. Greely, *Earthquake in California April 18, 1906*; Hansen, Hansen and Blaisdell, *Earthquake, Fire & Epidemic*; Kurzman, *Disaster!*; Thomas and Witts, *Earthquake*. [↑](#footnote-ref-3)
4. Steele, *The City that is: The Story of the Rebuilding of San Francisco in Three Years*. Originally published in 1909; Ackley, *San Francisco's Jewel City*; The Museum of the City of San Francisco, “San Francisco one year later”; Vale and Campanella, *The Resilient City*, 45. [↑](#footnote-ref-4)
5. Siodla, “Razing San Francisco,” 48–61; Siodla, “Clean slate,” 1-16; Godfrey, “Urban Development and Redevelopment in San Francisco,”309-333; Haas, Kates and Bowden, *Reconstruction Following Disaster*. [↑](#footnote-ref-5)
6. Kroll-Smith and Brown-Jeffy, “A Tale of Two American Cities,” 527-551; Fradkin, *The Great Earthquake and Firestorms of 1906*; Steinberg, *Acts of God*; Davies*, Saving San Francisco*. [↑](#footnote-ref-6)
7. Soens, “Resilient societies, vulnerable people,” 176. [↑](#footnote-ref-7)
8. International Monetary Fund - Fiscal affairs department, *Dealing with Increased Risk of Natural Disasters*; Institute for European Environmental Policy, *Climate change and natural disasters: Scientific evidence of a possible relation between recent natural disasters and climate change.* [↑](#footnote-ref-8)
9. O’Keefe, Westgate and Wisner, “Taking the naturalness out of natural disasters,” 556-557. [↑](#footnote-ref-9)
10. Maskrey, *Disaster mitigation,* 1. [↑](#footnote-ref-10)
11. Wisner, et al., *At Risk,* 11. [↑](#footnote-ref-11)
12. Wisner and Luce, “Disaster vulnerability,” 128. [↑](#footnote-ref-12)
13. Blaikie and Brookfield, *Land Degradation and Society*. [↑](#footnote-ref-13)
14. Chambers, “Vulnerability, Coping and Policy,” 1-7. [↑](#footnote-ref-14)
15. Hawkins and Maurer, “Bonding, Bridging and Linking,” 1777–1793. [↑](#footnote-ref-15)
16. Singleton, “Using the disaster cycle in economic and social history,” 53-78; Coetzee, and Van Niekerk, “Tracking the evolution of the disaster management cycle,” 1-9. [↑](#footnote-ref-16)
17. Holling, “Resilience and Stability of Ecosystems,” 1-23. [↑](#footnote-ref-17)
18. Walker, Holling, Carpenter and Kinzig, “Resilience, Adaptability and Transformability in Social–ecological Systems.” [↑](#footnote-ref-18)
19. Béné, et al., “Is resilience a useful concept in the context of food security and nutrition programmes?” 123-138. [↑](#footnote-ref-19)
20. Endfield, “The Resilience and Adaptive Capacity of Social-environmental,” 3676-3681. [↑](#footnote-ref-20)
21. Adger, “Social and ecological resilience,” 347–364. [↑](#footnote-ref-21)
22. Steinberg, *Acts of God, 46*. [↑](#footnote-ref-22)
23. Deryugina, Kawano and Levitt, “The Economic Impact of Hurricane Katrina on its Victims,” 202-233. [↑](#footnote-ref-23)
24. Odell and Weidenmier, “Real Shock, Monetary Aftershock,” 1009; Stewart, “Migration to U.S. frontier cities and job opportunity, 1860–1880,” 528. [↑](#footnote-ref-24)
25. Total population of 342,782 according to the 1900 cencus, Census Bureau, *Supplement for California: Populatuon*, (The 1910 Census Report); Issel and Cherny, *San Francisco, 1865–1932*, 23-24. [↑](#footnote-ref-25)
26. Steinberg, *Acts of God*, 27. [↑](#footnote-ref-26)
27. National Oceanic and Atmospheric Administration, *A study of earthquake losses in the San Francisco Bay Area*, 220. [↑](#footnote-ref-27)
28. Odell and Weidenmier, “Real Shock, Monetary Aftershock,” 1002. [↑](#footnote-ref-28)
29. Hansen, Hansen and Blaisdell, *Earthquake, Fire & Epidemic.* [↑](#footnote-ref-29)
30. Davies, *Saving San Francisco*, 42. [↑](#footnote-ref-30)
31. Thomas and Witts, *Earthquake*, 247. [↑](#footnote-ref-31)
32. Steinberg, *Acts of God*, 27. [↑](#footnote-ref-32)
33. Thomas and Witts, *Earthquake,* 134. [↑](#footnote-ref-33)
34. Coetzee and Van Niekerk, “Tracking the evolution of the disaster management cycle,” 1-9. [↑](#footnote-ref-34)
35. Singleton, “Using the disaster cycle in economic and social history,” 53-78; [↑](#footnote-ref-35)
36. Haas, Kates and Bowden, *Reconstruction Following Disaster*. [↑](#footnote-ref-36)
37. Haas, Kates and Bowden, *Reconstruction Following Disaster*, 1, 3-5. [↑](#footnote-ref-37)
38. Strupp, “Dealing with Disaster,” 21. [↑](#footnote-ref-38)
39. Ibid., 16. [↑](#footnote-ref-39)
40. Fradkin, *The Great Earthquake and Firestorms of 1906,* 80-82. [↑](#footnote-ref-40)
41. Thomas and Witts, *Earthquake*, 249. [↑](#footnote-ref-41)
42. Phillips, “Coping with financial catastrophe,” 90. [↑](#footnote-ref-42)
43. Davies, *Saving San Francisco,* 44. [↑](#footnote-ref-43)
44. Strupp, “Dealing with Disaster,” 9. [↑](#footnote-ref-44)
45. Ibid., 20. [↑](#footnote-ref-45)
46. Issel and Cherny, *San Francisco, 1865–1932*, 39. [↑](#footnote-ref-46)
47. Siodla, “Clean slate,” 3. [↑](#footnote-ref-47)
48. Siodla, “Razing San Francisco,” 50. [↑](#footnote-ref-48)
49. Siodla, “Clean slate,” 5; Strupp, “Dealing with Disaster,” 28; Issel and Cherny, *San Francisco, 1865–1932,* 203. [↑](#footnote-ref-49)
50. Sjoberg, “Disasters and Social Change,” 358. [↑](#footnote-ref-50)
51. Ruggles, et al. IPUMS USA: Version 10.0 [dataset]. Minneapolis, MN: IPUMS, 2020. [↑](#footnote-ref-51)
52. Davies, *Saving San Francisco*, 12. [↑](#footnote-ref-52)
53. Census Bureau, *Supplement for California*, (The 1910 Census Report), 569. [↑](#footnote-ref-53)
54. Siodla, “Razing San Francisco,” 59. [↑](#footnote-ref-54)
55. Pelling, *The Vulnerability of Cities,* 164. [↑](#footnote-ref-55)
56. Issel and Cherny, *San Francisco, 1865–1932*, 39. [↑](#footnote-ref-56)
57. Davies, *Saving San Francisco,* 12. [↑](#footnote-ref-57)
58. Ibid., 54. [↑](#footnote-ref-58)
59. Ibid. [↑](#footnote-ref-59)
60. Ibid. [↑](#footnote-ref-60)
61. Haas, Kates and Bowden, *Reconstruction Following Disaster*, 82. [↑](#footnote-ref-61)
62. Strupp, “Dealing with Disaster,” 33. [↑](#footnote-ref-62)
63. Davies, “Saving San Francisco,” 120. [↑](#footnote-ref-63)
64. Kurzman, “*Disaster!”* 232. [↑](#footnote-ref-64)
65. Steinberg, *Acts of God*, 44; Hansen, Hansen and Blaisdell. *Earthquake, Fire & Epidemic*. [↑](#footnote-ref-65)
66. Davies, *Saving San Francisco,* 15 & 93. [↑](#footnote-ref-66)
67. Strupp, “Dealing with Disaster,” 34. [↑](#footnote-ref-67)
68. Pan, *The Impact of the 1906 Earthquake on San Francisco’s Chinatown*, 101-102. [↑](#footnote-ref-68)
69. Strupp, “Dealing with Disaster,” 34. [↑](#footnote-ref-69)
70. Pan, *The Impact of the 1906 Earthquake on San Francisco’s Chinatown*, 113. [↑](#footnote-ref-70)
71. Sjoberg, “Disasters and Social Change,” 362. [↑](#footnote-ref-71)
72. Stewart, “Migration to U.S. frontier cities and job opportunity, 1860–1880,” 531. [↑](#footnote-ref-72)
73. Ruggles, et al., IPUMS USA: Version 10.0 [dataset]. Minneapolis, MN: IPUMS, 2020. [↑](#footnote-ref-73)
74. IPUMS, “What is ipums.” [↑](#footnote-ref-74)
75. Census Bureau, “Residence rule.” [↑](#footnote-ref-75)
76. Subpopulations are sampled independently. The total population is partitioned according to its characteristics (stratification), producing collectively exhaustive and mutually exclusive subgroups. Hence, closing the gap in accuracy between random samples and the total dataset. [↑](#footnote-ref-76)
77. Jordan, ed., “*The California Earthquake of 1906*”; Lawson et al., *“The California Earthquake of April 18, 1906.”* [↑](#footnote-ref-77)
78. Census Bureau, *Supplement for California* (The 1910 Census Report). [↑](#footnote-ref-78)
79. Ferrie, “The end of American exceptionalism,” 199–215. [↑](#footnote-ref-79)
80. Census Bureau, *Supplement for California* (The 1910 Census Report). [↑](#footnote-ref-80)
81. The “Single, not married” include both the widowed and the divorced. Both these categories are minor compared to the share of those never married at all. Notably, the divorced make up 1-2 percent of the German segment and are virtually absent for the Chinese and the catholic Irish and Italians. [↑](#footnote-ref-81)
82. Davies, *Saving San Francisco,* 15. [↑](#footnote-ref-82)
83. Strupp, “Dealing with Disaster,” 34; Pan, *The Impact of the 1906 Earthquake on San Francisco’s Chinatown*, 101-102. [↑](#footnote-ref-83)
84. Bavel, et al., “Climate and society in long-term perspective,” 1-19. [↑](#footnote-ref-84)
85. Walker, “Economic Opportunity on the Urban Frontier,” 261. [↑](#footnote-ref-85)
86. Davies, *Saving San Francisco,* 57. [↑](#footnote-ref-86)
87. Ferrie, “The end of American exceptionalism,” 199–215. [↑](#footnote-ref-87)
88. Stewart, “Migration to U.S. frontier cities and job opportunity, 1860–1880,” 531. [↑](#footnote-ref-88)