Depressive symptoms

Both men and women living alone have higher odds for depressive symptoms compared to men and women living with a partner. The results are significant for men indicating that those living alone have more than three times higher odds (OR=3.52, CI=2.25-5.48) for reporting depressive symptoms compared to men living with a partner (Table 2, Model 1). Also when control variables are included in the regressions the results are about three times higher (OR=3.36, CI=2.08-5.44) for men living alone (Table 2, Model 2). For women living alone the results point at the same direction as for men living alone. The unadjusted results have an odds ratio over two (OR=2.1, CI=1.49-2.96) and the adjusted slightly under two (OR=1.88, CI=1.28-2.77) (Table 3, Model 1 and 2). When considering educational level both men and women show signs of being less likely to report depressive symptoms when comparing all the three levels to the reference group “Compulsory school”, but none of the results are significant (Table 2 and Table 3, Model 2). Instead, self-rated health seems to be a crucial factor for depressive symptoms and the results are significant for both men and women living alone (Table 2 and 3, Model 2). Individuals who report poorer health also report higher odds for depressive symptoms. The results also indicate a significant interaction between living alone and gender. Men living alone have significantly higher odds for depressive symptoms compared to women living alone, which mean that men living alone are more disadvantaged in depressive symptoms compared to women living alone (P<0.05, more detailed data available upon request).

Mobility Problems

The results show that men living alone have about twice as high odds for mobility problems compared to men living with a partner (OR=2.08, CI=1.32-3.26), which also is significant (Table 2, model 1). When including control variables these results are attenuated but are presenting tendencies at the same direction but with a lowered, and statistically non-significant, odds ratio (OR=1.5, CI=0.89-2.52, Table 2, Model 2). The same pattern is found for women living alone, the results are significant in the unadjusted model which indicate that those living alone are twice as likely to report mobility problems compared to those living with a partner (OR=2.25, CI=1.51-3.34, Table 3, Model 1). When control variables are taken into account the odds ratio is lowered a bit and no longer significant (OR=1.35, CI=0.85-2.14, Table 3, Model 2). According to Model 2, higher age is significantly associated
with mobility problems for both men (OR=1.13, CI=1.09-1.18, Table 2, Model 2) and women (OR=1.1, CI=1.05-1.15, Table 3, Model 2). Even higher odds ratios are found for self-rated health. Men living alone with “Neither good or bad health” are four times more likely to report mobility problems (OR= 4.55, CI=2.83-7.32, Table 2, Model 2) compared to men with “Good health”. The odds regarding self-rated health status among women seems to point at the same direction when comparing “Neither good or bad health” with “Good health” (OR=7.72, CI=4-13.04, Table 3, Model 2). No significant gender difference can be stated whether men living alone or women living alone have higher odds for mobility problems.

**Social activity**

Table 2, Model 1 and 2, show that men living alone are less likely to be socially active compared to men living with a partner (B=-0.92, CI=-1.43,-0.40, Table 2, Model 1). This result remains when control variables are included (B=-0.65, CI=-1.17,-0.14, Table 2, Model 2). Corresponding numbers for women living alone change from a negative coefficient (B=-0.56, CI=-1.02,-0.10, Table 3, Model 1) to a slightly positive coefficient (B=0.12, CI=-0.34-0.59, Table 3, Model 2) when control variables are included in the regression. The difference between women living alone and women living with a partner is not significant in Model 2 when age, educational level and self-rated health are taken into account. This means that the lower levels of social activity among women living alone is explained by higher age and worse self-rated health, and when these factors are taken into account there is no difference in social activity between women living alone and women living with a partner. The significant results presented regarding age indicate that an increase in age decreases the likelihood for social activity among both men (B=-0.05, CI=-0.09,-0.02, Table 2, Model 2) and women (B=-0.10, CI=-0.14,-0.06, Table 3, Model 2). Also poorer health seems to be central for the degree of social activity among older individuals and the results are significant for both men and women. Men with “Bad health” are less likely to be socially active compared to men with “Good health”, (B= - 1.63, CI=-2.51,-0.75, Table 2, Model 2) and women with “Bad health” are also less likely to be socially active compared to women with “Good health” (B= -1.90, CI=-2.68,-1.16, Table 3, Model 2). For social activity a significant interaction between men and women can be observed (P< 0.001, more detailed data available upon request), which indicates that men living alone are less socially active compared to women living alone.
**Disorganized local community**

The results show that men living alone (B= 0.78, CI=0.41-1.15, Table 3, Model 1) and women living alone (B=0.5, CI=0.19-0.82, table 3, Model 1) are significantly more likely to live in a disorganized local community compared to men and women living with a partner. Also when these results are controlled for age, educational level and self-rated health, they point in the same direction and are significant (Table 2 and 3, Model 2). Both men and women are more likely to live in a disorganized local community along as they report poorer health. The results are significant for both men (B=0.36, CI=0.01-0.72 Table 2, Model 2) and women (B=0.40, CI=0.06-0.74, Table 3, Model 2) when “Neither good or bad health” compares with “Good Health”, but when comparing “Bad health” to “Good health” only women show significant results to live in a disorganized local community (B= 0.89, CI=0.35-1.43, table 3, Model 2). No gender interaction can be observed regarding disorganized local community, which means that there are no significant differences between men living alone and women living alone with regard to live in a disorganized local community.

**Discussion**

**Summary of results**

This thesis aimed to advance the understanding of the living conditions among older individuals living alone in Sweden in relation to the four key sources to vulnerability: poverty and low socioeconomic status, personal limitations, low social network and lack of support, and physical location (Mechanic & Tanner, 2007). These sources were operationalized into the following five dimensions: financial insecurity, depressive symptoms, mobility problems, social activity and living in a disorganized local community, in order to investigate if older individuals living alone are more prone to vulnerability. This thesis also investigated if any gender differences could be found according to the dimensions of vulnerability. In line with broader literature on living conditions among older individuals living alone, and the sources to vulnerability, this thesis suggests that older individuals living alone in Sweden could be a more vulnerable group compared to those living with a partner with regard to both personal and community factors (Schulman et al., 2002; Kharicha et al., 2007; Mechanic & Tanner, 2007; Schroder-Butterfill & Marianti, 2006; Yeh & Sing Kai, 2004; Mahoney et al., 2000; Arendt, 2005; Kong & so, 2017; Van Heuvelen et al., 2006).
The age range among the individuals in this thesis varies from 70 to 105 years. The highest mean age (80.6 years) and also the oldest (105 years) can be found among women living alone. The sample size among men (n= 442) and women (n=546) are not exact equally allocated, which was expected due to the gender distribution in the older population in Sweden, in older ages more women are found (SCB, 2018). The results regarding the educational level between men and women follow the same trend as previous research presented in the field, showing that women in general have a lower educational level compared to men (Gaymu & Springer, 2012). In general, the numbers of university graduates is quite low and what can be remembered when analyzing the results, and especially for women, is the year of birth among the individuals. It is more common nowadays to have a university degree compared to when the individuals in this sample went to school, and especially the numbers and proportions for women have increased during recent decades (SCB, 2007).

**Living alone**

The distribution between men and women living alone in this thesis goes in line with previous studies showing that women at an older age live alone in a greater extent compared to men (Tomassini et al., 2004). In regard to the five dimensions of vulnerability: financial insecurity, depressive symptoms, mobility problems, social activity and living in a disorganized local community, the results presented in this thesis indicate that individuals living alone are more prone to vulnerability. This statement is based on the more disadvantaged circumstances among individuals living alone. This pattern can be shown in all the dimensions for both men and women living alone, with one exception. For women, living arrangement made no difference for social activity when age, educational level and self-rated health are considered (Table 3, model 2). Generally women seems to be more socially active and have more interaction with friends and relatives compared to men (Nordström, 2015), which may be a reason to why living arrangement do not matter for the degree of social activity among women.

Financial insecurity, one of the dimensions used in this thesis, is associated with vulnerability since it has many health related consequences and can also be crucial for life quality and well being (Diderichsen, 2007; Mechanic & Tanner, 2007). The results are in line
with the results presented by Schroder-Butterfill & Marianti (2006), implying that individuals living alone are more disadvantages in regard to financial insecurity compared to those living with a partner, which in that sense make those living alone more vulnerable. Suggestions to why living alone can affect the financial situation negative and lead to insecurity and vulnerability is because living alone could many times be linked to a loss of a spouse, and an extra income. This might be a possible explanation to why individuals living alone in this thesis reports more financial insecurity compared to those living with a partner. No differences between men and women living alone were observed, which differ from the results by Gaymu and Springer (2012) that highlights women living alone to be more prone for vulnerability in regard to financial insecurity. Women in these cohorts generally have lower educational level and therefore a lower income, which in this context make them more prone for having a low socioeconomic status, especially when living alone (Diderichsen, 2007; Gaymu & Springer, 2012). Previous suggestions in this thesis also mention recent decades improvements in older individuals financial situation to be a possible explanation to the increase in living alone. A better general economic situation among older individuals, especially women, might explain why no gender difference was observed. Today, gender differences in the financial situation are not as strong as decades ago, the imbalance in income and occupation possibilities may be more equal for individuals in this cohort (Tomassini et al., 2004; Parker & Agahi, 2013).

Both men and women living alone have higher odds for depressive symptoms compared to men and women living with a partner, which are in line with previous research by Schulman (2002). Also differences in depressive symptoms between men and women are found in this thesis (presented in following caption; “Gender differences”). When considering men and women living alone the results indicate that those who report worse self-rated health also report higher odds for depressive symptoms. It is possible that there is a closely connection between self-rated health and depressive symptoms, meaning that a higher degree of depressive symptoms affect individuals self-rated health, and also that a worse self-rated health have a negative impact on depression symptoms.

Mobility problems were more common among older individuals living alone in the unadjusted model for both men and women, which mean that they are more vulnerable in
regard to physical limitations and therefore have a higher risk of having difficulties in everyday life (Mechanic & Tanner, 2007; Gaymu & Springer, 2010). The odds ratio are not considerable much higher for those living alone though, which might be a positive consequence of the improved mobility and physical function that has been shown among older individuals in general (Tomassini et al., 2004). Still, there is a difference between the groups of living alone and living with a partner.

Bergland and Engedal (2011) suggest that women living alone have more problems in regard to mobility, keeping their balance and being frailer. Similar results can be seen in this thesis too, but only in the unadjusted analyses, which indicate that age, educational level and self-rated health do explain much of the differences between older women living alone and with a partner. The results presented about mobility problems are not very surprising or unexpected, especially not when age is considered. The significant results for age indicate higher odds for having mobility problems with increased age for both men and women. Many times increased age is associated with a higher degree of physical impairments, so it’s quite natural and common to have some kind of mobility problem later in life, but for those living alone the consequences may be worse. For example, it might be more demanding to take care of the household or going to the grocery store alone (Yeh & Sing Kai, 2004; Gaymu & Springer, 2010). In that sense, mobility problems can increase difficulties in everyday life for those who have mobility problems and also live alone, making them more vulnerable compared to those living a partner.

The link between self-rated health and mobility is clear and the high odds ratios for having mobility problems among those with poorer health are not surprising as these factors follow and affect each other. Also for mobility problems it might be a closely connection between self-rated health and mobility problems, which means that those with a higher degree of mobility problem also may perceive their health status as worse, while at the same time a worse self-rated health might aggravate mobility problems. The results by Mahoney et al. (2000) suggests that individuals living alone are less likely to improve their function after being hospitalized in comparison to those living with a partner. The reason for this may be the limited access to practical and mental support from someone because they do not have anyone in the household to get the support from (Rosso et al., 2013).
It has been proposed that older men and women living alone have a lower degree of social interaction than those living with a partner (Kharicha et al., 2007). Similar results can be presented in this thesis for both men and women when no control variables are considered. When age, educational level and self-rated health status are included in the analyses, the results between men and women differ (presented in following caption; “Gender differences”). For both men and women increased age was associated with a lower degree of social activity, which was quite expected because in older ages the social network declines as a result of disease and death (Mechanic & Tanner, 2007).

The results for disorganized local community indicate that individuals living alone are more likely to report that they live in a disorganized local community compared to those living with a partner. A possible reason is that those living alone might have a lower income (one income instead of two) and therefore not have the same possibilities to afford a home in a more organized local community compared to couples with a double income. It is also possible that individuals who previously lived with a partner move to a smaller apartment in a new community when they become widows, for example to minimize the expenditures or work required for a larger household. The new community might feel new and strange to them, and because of that, they may perceive their local community as e.g. unsafe. Individuals living alone can also feel insecure just because they are living alone and then respond to the questionnaire according to how they feel. This is another possible explanation to why they seem to live in a disorganized local community according to the analyses. In other words, it might not be the community they live in that is disorganized, it may instead be their living arrangement and living conditions that causes these experiences. Therefore, those living alone and those living with a partner may have different experiences of the same community.

The results also indicate that self-rated health seems to be important, those with poorer health report that they are more likely to live in a disorganized local community compared to those with good health. There are several possible explanations for that. First, self-rated health might affect individual’s psychological approach and well being, those with poorer health might because of their bad health status also be affected in their mood and attitude to life in general, also the approach to the community. Second, a poorer health status can in
a physical way narrow possibilities to be included in the community and the social environment in it. Individuals suffering from a disease or disability don’t have the same opportunities as individuals without a disease or disability to be integrated, and therefore respond lower on those questions. Health problems might also limit chances to walk into green parks near by, if there are any, or to utilize other mechanisms that have been mentioned as positive within the community (Stahl et al., 2017). Therefore, it might seem like the community is disorganized, but again, in total it is about the attitudes and perceptions among individuals with poorer health. Although the results not show any gender differences, following statements are suggested as alternative assumptions about possible differences not shown in the analyses. Generally, women in Sweden experience more insecurity in the local community compared to men (Hvitfeldt, Westerberg, Irlander, Frenzel, & Strid, 2016). Having a disease, like a broken hip, may therefore be more critical for being afraid of walking in the dark for women compared to men because women in general, and older women in particular, could be seen, or see themselves, as more vulnerable. This could be even worse for women living alone.

Gender differences

Two significant interactions between gender and living arrangement were observed in this thesis with regard to the dimensions of vulnerability. The first is presented in connection to depressive symptoms and the other to social activity. Both men and women living alone have higher odds to report depressive symptoms compared to those living with a partner, in line with previous research by Schulman (2002). The interaction analysis indicates that the odds for depressive symptoms was greater for men living alone compared to women living alone, which is the opposite result as earlier studies suggests which indicate that women living alone were more likely to report depressive symptoms compared to men living alone (Lin & Wang, 2011).

A possible explanation to the dissimilar results might be the countries where the studies take place. The study by Lin and Wang (2011) collected their data from Taiwan and this thesis includes data from Sweden. Individuals in different parts of the world might be influenced by cultural factors and norms within their own country, and therefore the result in terms of gender may differ. For example the view of life, and also meaning of life might
differ because of religion and faith. It is possible that the political system in Taiwan (as a republic if China) have put women in a more disadvantaged position and therefore, as a result of disparities in human capital, education and income, women might perceive more depressive symptoms compared to men (Jongsung, 2013).

This thesis investigated depressive symptoms, not depression in itself, but it is important to consider also symptoms of depression among older individuals. Schulman (2002) highlights the problem of underestimation in depressive symptoms among older individuals living alone, and according to (Wada et al., 2004) depressive symptoms could lead to further risks later in life and also increase risks for mortality.

The second significant interaction between gender and living arrangement was found for social activity where men living alone are less likely to be socially active compared to women living alone. Living arrangement made no difference for social activity among women, while men living alone were less socially active than men living with a partner. Low social interaction has been suggested as a significant risk factor for developing depressive symptoms among older individuals (Rosania, 2015), and previous studies highlight the importance of good social relations and social activity to maintain life satisfaction and quality of life (Bowling, 1995; Wilhelmson et al., 2005; Doyle & Forehand, 1984; Easterlin, 2001; Ferring et al., 2004; Mechanic & Tanner, 2007). It could be that the lower social activity and higher depressive symptoms that are found among men living alone are associated. In other words, it is possible to imagine a hypothetic link between the higher odds ratio for having depressive symptoms among men living alone and their lowered odds for being socially active. It is possible that individuals, and especially men, in Sweden with their welfare system, have a lower level of family interaction because of the high social protection the welfare system offer. This in turn, means that more effort is required to keep in touch with friends and family, an effort that might be too demanding with increased age.

As mentioned earlier, social isolation has many negative outcomes, e.g. mental health problem such as depression (Rosania, 2015). As a result of lower levels of social interaction and living without a companionship (Hawthorne, 2006), men living alone in this thesis are a group more prone for vulnerability in terms of social isolation. Since increased age often is associated with a loss of a spouse, friends or other relatives, many older individuals might
become less active than they wish to because of fewer individuals to be socially active with along increased age (Schroder-Butterfill & Marianti, 2006). In other words, the lowered level of social activity might not be self-elected. On the other hand, this thesis not directly measure the quality of social activity, only how often and with whom, therefore it is not possible to express whether those with a lower degree of social activity also are social isolated. Also, in terms of the used questions for this measured item, a higher level of social activity doesn’t have to be synonymous with only positive effects. Relationships with relatives or families can sometimes be linked to situations being more demanding than enjoyable. Frequent visits from family members are not always a “social activity” in these age groups as it can be connected with the receipt of informal care as a complement to formal care and home help services (Van Groenou & De Boer, 2016).

Strengths and limitations of the thesis

When interpreting the findings in this thesis, it is of importance to acknowledge possible strengths and limitations. Since the study sample was based on SWEOLD, which is a nationally representative sample of individuals aged 70-105 living in Sweden, the results in this thesis are generalizable to individuals living in Sweden within the same age range. SWEOLD also consist a sample with a high response rate (84.3 %). Another strength is that several items are included to measure older individuals living conditions and whether they are more or less prone to vulnerability. Most of the previous research has only paid attention to two or three of these living conditions. The items about local community are new in SWEOLD, which gives this thesis a new insight in that area among older individuals in Sweden. The Geriatric Depression Scale is a validated instrument and the items included were coded accordingly. The cutoff for numbers of symptoms to be included in the “Group for depressive symptoms” was 1, which mean that it was enough to report only one symptom to be included. Therefore, a sensitivity analysis was done to see what happened to the results if two symptoms were the cutoff to be included in the “Group for depressive symptoms”. The results point in the same direction even when with the higher cutoff, which confirms the results.

This thesis also has some limitations that should be mentioned. First, the analyses are based on cross – sectional data and it is therefore not possible to claim any causal conclusions
between living alone and the dimensions of vulnerability. As many studies suggest, living alone as an older individual can adversely affect many factors related to living conditions, but living conditions in itself might also affect the conditions for living in a partnership. For example, Individuals with depressive symptoms, a lower degree of social network or functional disadvantages might also be more likely to live alone later in life (Shaw et al., 2017). However, since the purpose of this thesis is to describe the vulnerability in a subgroup at one point in time, and not to determine causality, there is no need for a longitudinal study. Second, the sample size became quite limited after the analytical sample was selected. Third, the low value in the Cronbach’s alpha test for “Disorganized local community” (Cronbach’s alpha = 0.489) indicate that the items used for this measurement only partly capture a common underlying factor. However, this is to be expected since the items were specifically chosen to represent distinctly different aspects of the local community.

Policy implications
Since few studies in Sweden have estimated the current status regarding vulnerability among older individuals living alone the knowledge about it is limited, especially with regard to gender. Because the number of individuals living alone in Sweden will increase during the coming decades (Sundström, 2014), it is of public health relevance to investigate whether living alone, and also gender, is associated to vulnerability.

With this deeper insight in living conditions and vulnerability among older individuals living alone in Sweden it is possible to obtain a greater understanding in where policies to support and strengthen this group should be placed. Based on this thesis, one area where focus is needed among individuals living alone is regarding health limitations. The results in this thesis show that those living alone have greater mobility problems and more depressive symptoms and the results by Mahoney et al. (2000) suggests that individuals living alone are less likely to improve their function after being hospitalized. From this perspective, the expected increase in individuals living alone is alarming (Sundström, 2014) because it could imply that even larger numbers of individuals will remain having functional problems and be more disabled during the following decades. This suggests that individuals living alone are in greater need for resources in terms of help and support to regain their physical and mental
health after hospitalization or other health events. In the long run, faster deterioration in function is devastating for the individual, and also for society and public expenses since it would entail a cost in resources such as time, money and workforce. Solitary living older individuals with a higher degree of personal limitations can be seen as a further subgroup being more prone to vulnerability, with an even greater need for planning and interventions to improve their health status and lower the risks for further problems and vulnerability. Focus should also include preventive health work to minimize later consequences and delay pain, mobility problems, depressive symptoms, disease and disability. A possible approach could be to involve older individuals in physical training groups taking place in their local community, which might be beneficial and positive, both from a social perspective but also in regard to their mental and physical status (Musich et al., 2017).

Conclusions
Based on the four key sources to vulnerability suggested by Mechanic and Tanner (2007), this thesis concludes that men and women living alone are more prone to vulnerability compared to those living with a partner. Gender differences were found for depressive symptoms and social activity. When it comes to depressive symptoms, men living alone report more depressive symptoms than women living alone. For social activity men living alone are less likely to be socially active compared to women living alone. No difference between women living alone and women living with a partner are presented in regard to social activity, while men living alone are less socially active compared to men living with a partner. This highlights that men who live alone are more prone for vulnerability in the sense of having more depressive symptoms and being less socially active. For further research it would be of interest to investigate if the risk for vulnerability differs with regard to civil status among individuals living alone. For example, if differences can be observed between those recently widowed and individuals widowed years ago, as well among those who are divorced or never married. Taken together, these results imply that individuals living alone might be in a greater need for resources to decrease the risk of vulnerability.
References


