Escola Tècnica Superior d'Enginyeria Informàtica

Universitat Politècnica de València

Annex C (Multidimensional analysis)

As not every categorical variable has been treated, it would be adequate to bring them despite they don't show correlationship. This annexe helps to discard relationships that might seem logical but statiscally are not possible.

Multidimensional Analysis of Qualitative Variables

The distribution of the age ranges can be kwown with the variable **Age_recod**. Imagine that **Insomnia** is compared with **Hours per day**. It'll be necessary to check first if every range of age has the same distribution of **hours** listened. In that case, the whole sample will be used but if it is not, the conclusions will be brought to (16-30) range, as it is the largest. The image down below shows the frequencies of every age range. (16-30) range is the most popular.

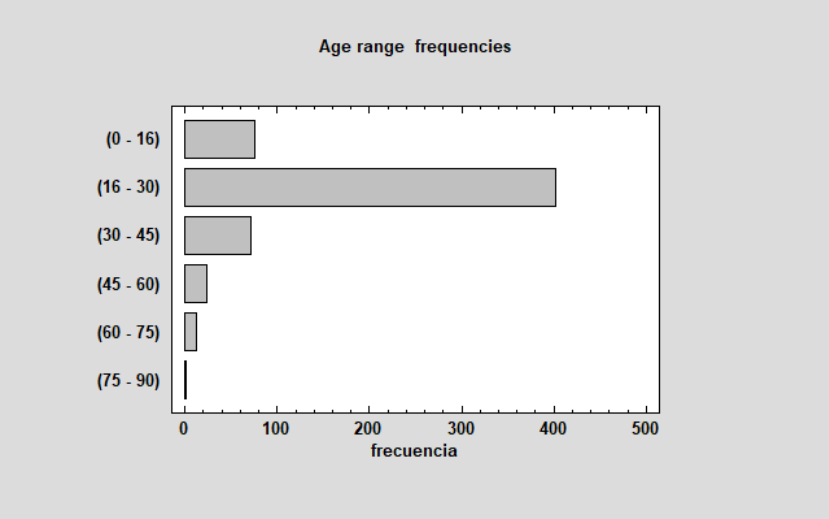

Figure 79

Age range – Anxiety/Depression/Insomnia/OCD

Do anxiety, depression, insomnia and OCD have the same distribution through every age range? The answer is Yes. Squares with the same color, which represent an age range, have similar sizes in every level of anxiety, depression, insomnia and OCD. This means these 4 variables share same distribution

for every age range. This analysis is necessary in order to know whether it is better to make a relationship with one range or the every age range.

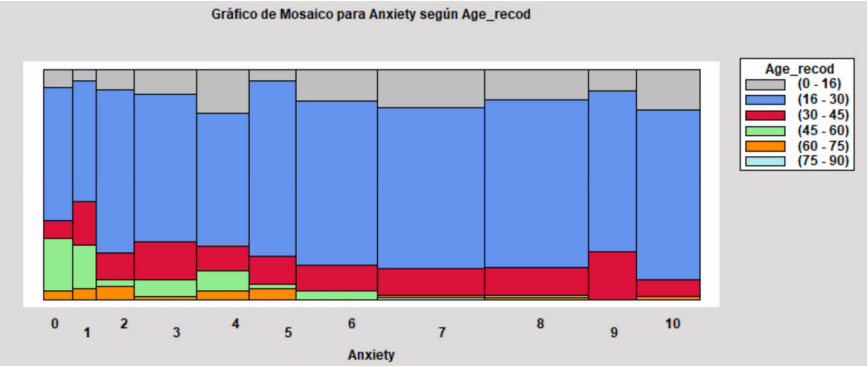

Figure 80

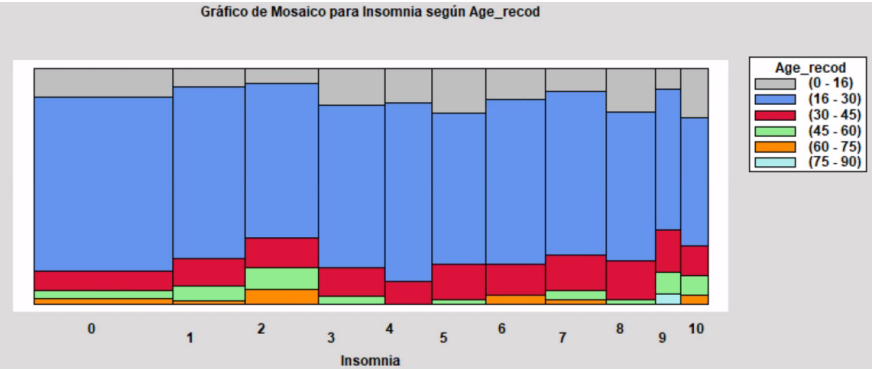

Figure 81

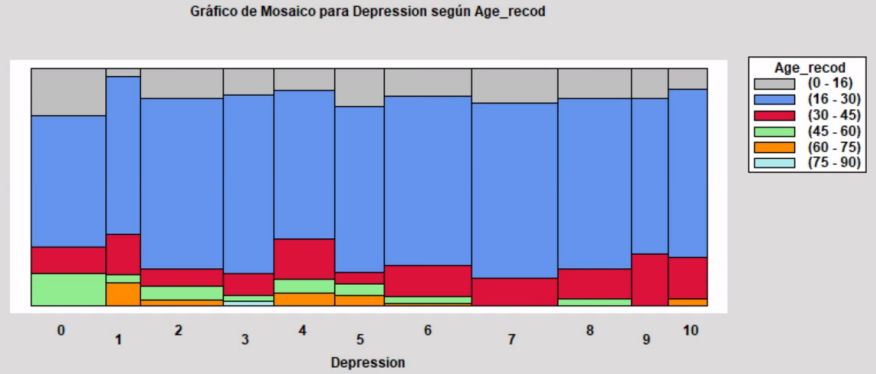

Figure 82

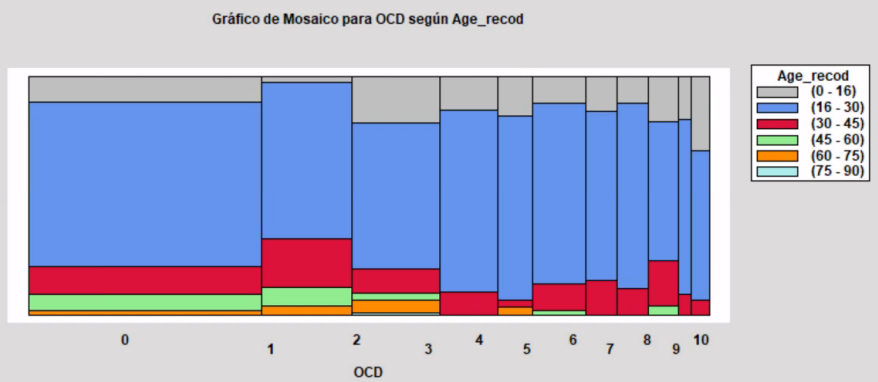

Figure 83

Hours per day – anxiety/depression/insomnia

Hours per day, Anxiety, Depression and **Insomnia** are ordinal qualititative variables (because of their few values) with values between 0 and 10. Let's compare its distribution with **Age_recod** as said.

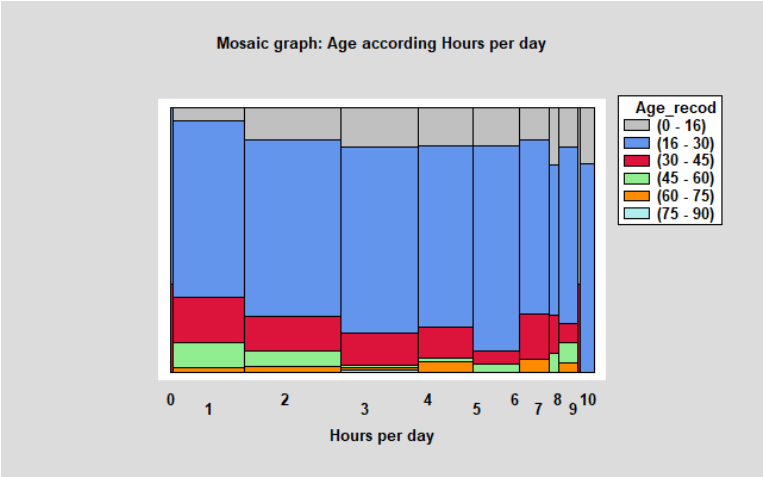

Figure 84

The proportions of each age range in every amount of **Hours per day** are quite the same. This means the hours of music you consume are not related to age.

So that the variables **Hours per day** and can be considered related, Kendall parameter should approach to –1 or 1. In this case they're clearly closer to 0 so there's no relationship.

ANXIETY	DEPRESSION	INSOMNIA
Coef. De Contingencia 0,3131 Cramer's V **0,1475** Kendall's Tau b 0,0016	Coef. De Contingencia 0,3953 Cramer's V **0,1361** Kendall's Tau b 0,0914	Coef. De Contingencia 0,4037 Cramer's V **0,1395** Kendall's Tau b 0.0912

Figure 85

To listen more hours of music per day does not contribute to lower or higher levels of **Anxiety, Depression** or **Insomnia** than listening to less hours.

Fav-genre – anxiety/depression/insomnia

Fav genre is a qualitative variable with 16 possible values. Does it have the same distribution for every poblational group according to age?

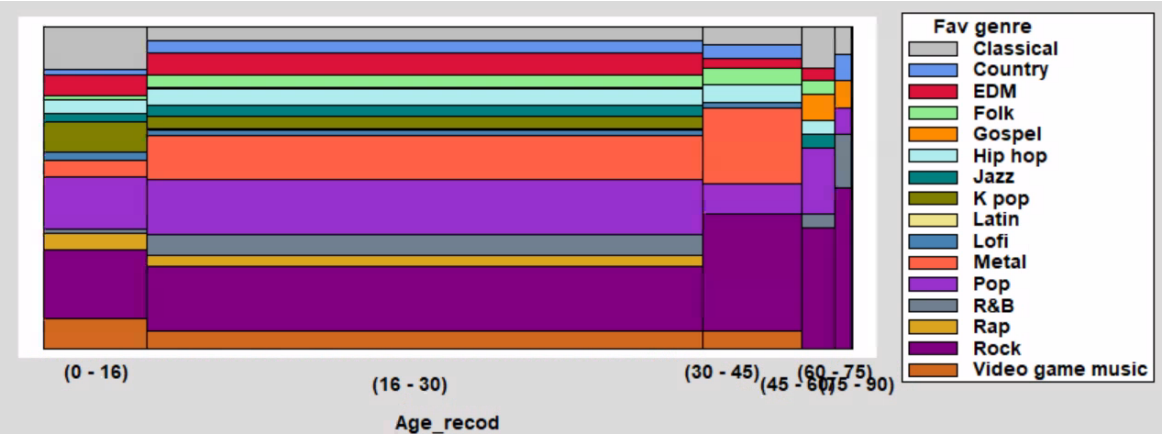

Figure 86

Every range has similar proportions of favourite genres so the whole sample will be used. Now, ¿Has any **genre** in particular higher values of **Insomnia, Anxiety, Depression** or **OCD**? This is relevant at the moment of determining if some genre leads generally to sadness or not.

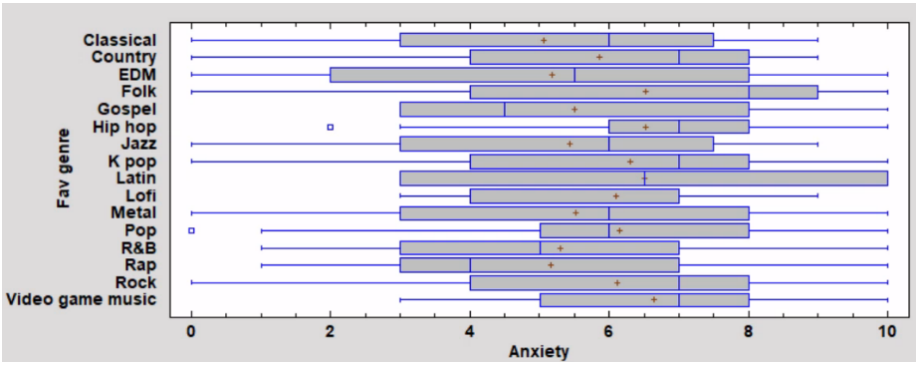

Figure 87

At first sight, every genre has similar distribution in terms of **Anxiety** at mid-high levels.

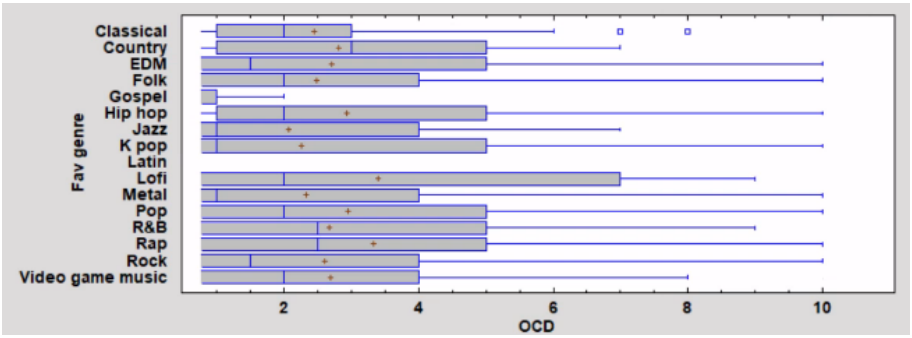

Figure 88

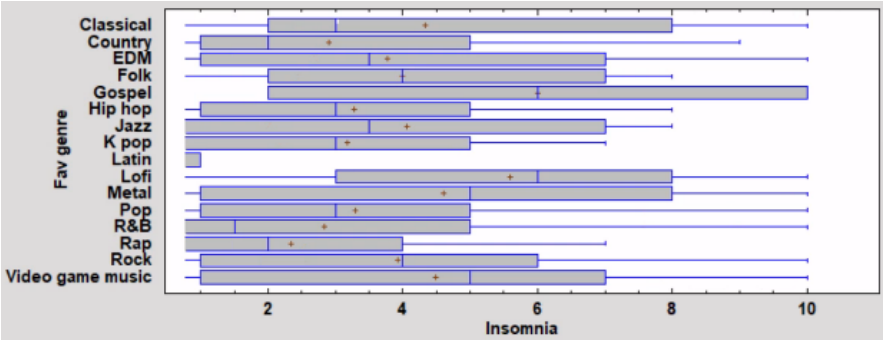

Figure 89

It is shown that listening to music in any genre gives low levels of **OCD** and **Insomnia**

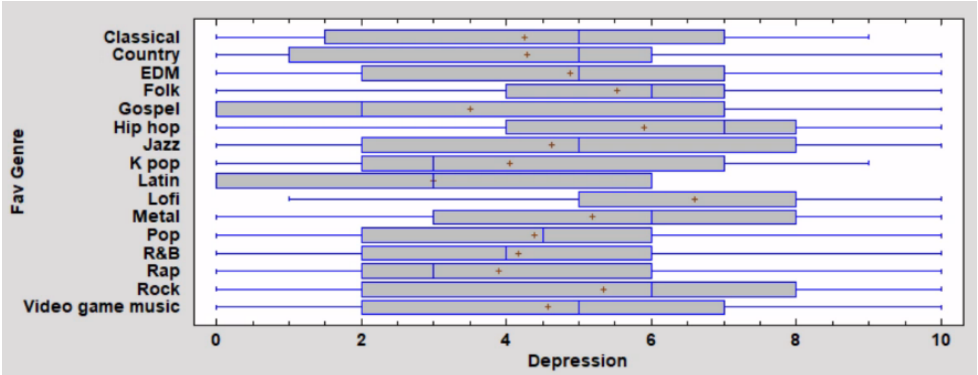

Figure 90

Excepting Latin and Gospel, due to having barely 4 values, every range get together in mid **Depression** levels.

No specific genre has been deviated from the rest drastically, meaning that there's no need in picking a genre to focus on it.

Cramer's V is used when there are nominal qualitative variables. Besides, Kendall is used when they are ordinal. In this case there are nominal **(Fav genre)** and ordinal **(Insomnia, Depression, Anxiety)** variables. Contingency is removed because it only can be used in case there'are the same ammount of values in both variables. This requirement is not met. Cramer and Kendall rule, they'll be our reference. None of them are closer to 1 than to 0. There's no relation.

While working – anxiety/depression/insomnia

While working is a nominal qualitative variable with two possible outcomes, Yes or No. Will there be clearly higher levels of **Anxiety**, **Depression** or **Insomnia** for people who **listen to music while working**? As always, let's see how **While working** is distributed through the ages.

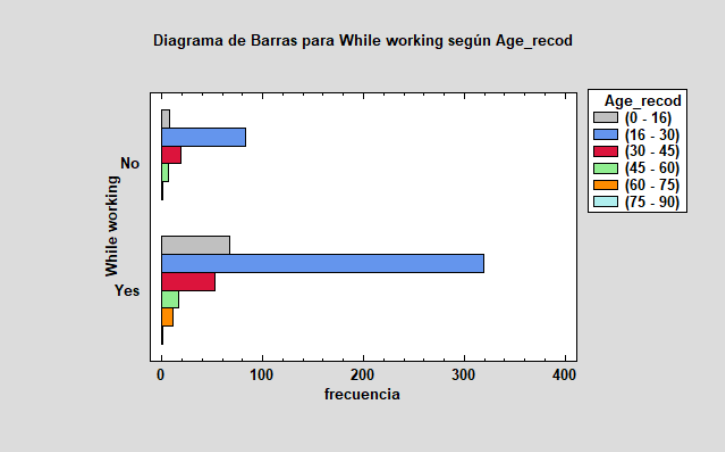

Figure 91

Every range follows a proportion between people who listen to music while working or not, so the whole sample will be used.

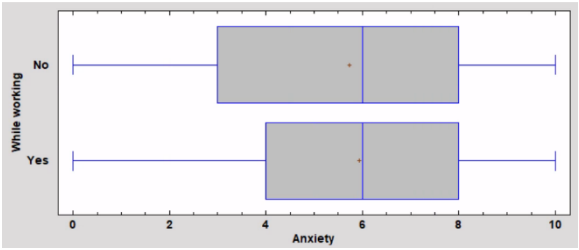

Figure 92

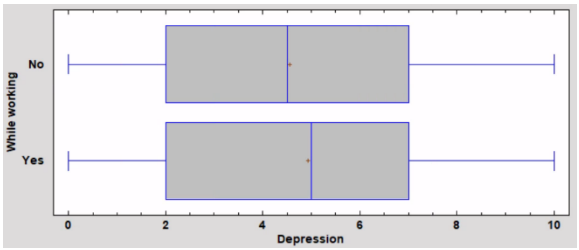

Figure 93

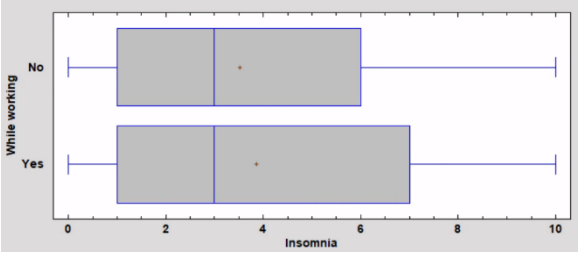

Figure 94

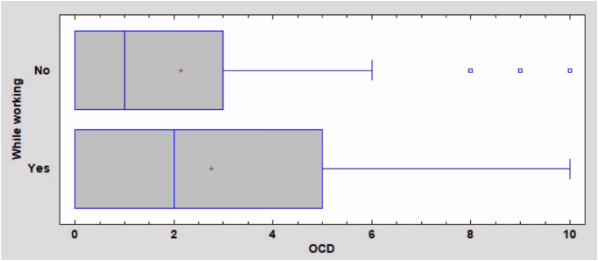

Figure 95

People who listen to music **while working** have higher OCD and **Insomnia** values than people who don't. It happens the opposite in Anxiety and Depression stays the same.

Listening to music while working doesn't affect at all the mental health

Foreign language – anxiety/depression/insomnia

Will listening to **Foreign Language** somehow affect the levels of Anxiety, Depression or Insomnia?. First of all, let's see the how it is distributed among the ages.

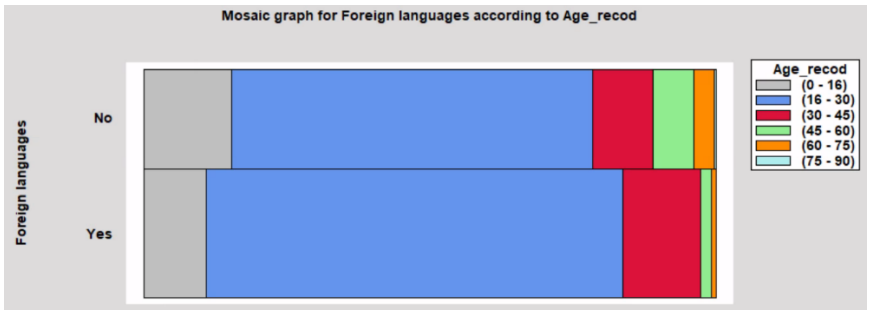

Figure 96

The first age intervals, have similar amounts of individuals, besides, ranges are distributed pretty similar in both cases. The whole sample will be used.

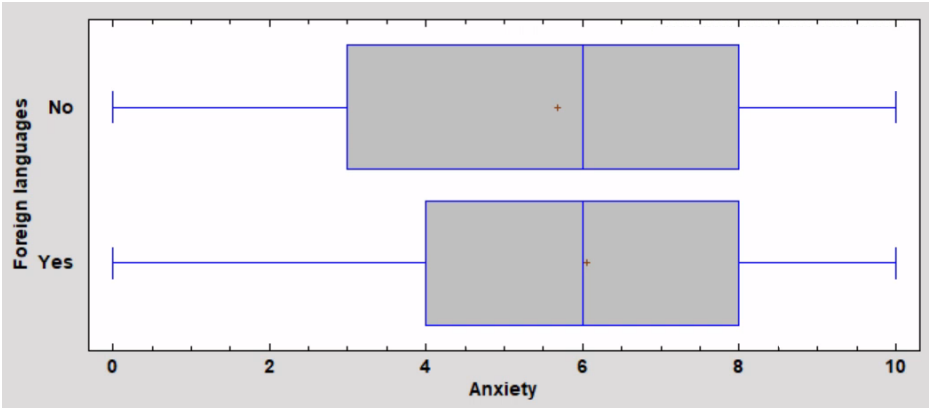

Figure 97

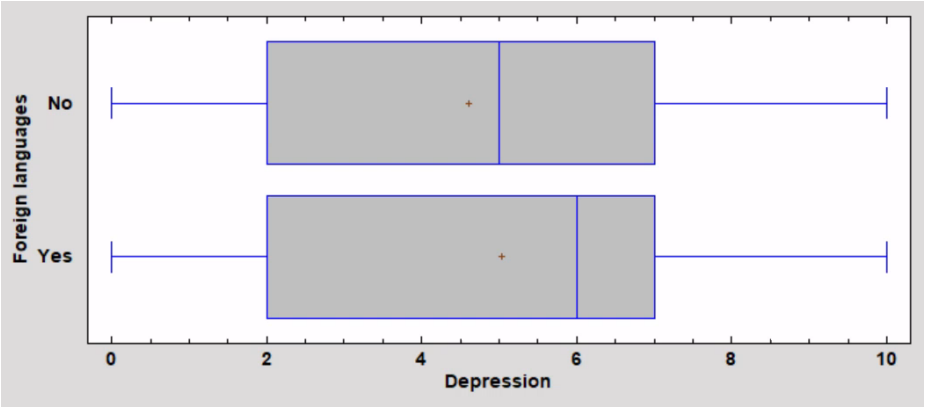

Figure 98

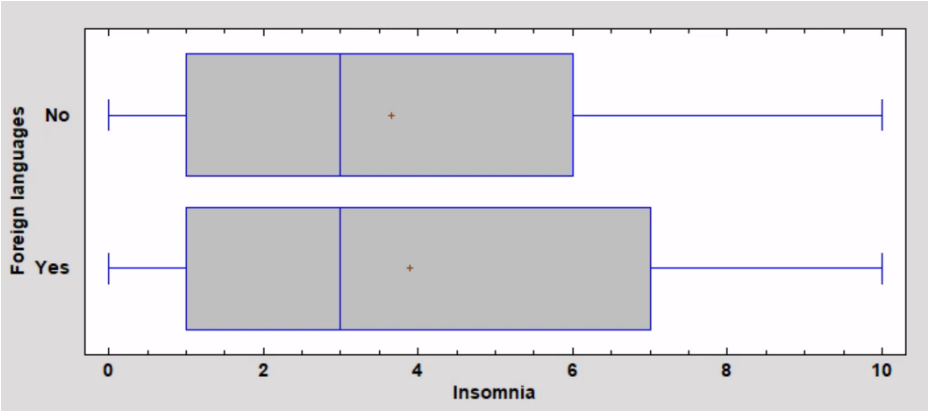

Figure 99

Both **Insomnia** and **Anxiety** have their respective couple of Box&Whisker graphs slightly different distributions. In the case of Anxiety, individuals who don't listen to **foreign music** have their values of Anxiety more scattered below than the ones who do. On the other side, individuals who listen to **foreign language** music have their values of Insomnia more scattered above than the ones who don't. This soft difference is not enough as the Kendall coeficient or Cramer's V are closer to 0.

Anxiety	Insomnia
Cramer's V 0,1758 Kendall 0,0637	Cramer's V 0,1484 Kendall 0,0303

Figure 100

Being most likely to listen to foreign music doesn not affect **Anixety**, **Depression** or **Insomnia** at all.

Instrumentalist – anxiety/depression/insomnia

Is the simple fact of being an **instrumentalist** capable of changing the levels of anxiety, depression or insomnia while listening to music?

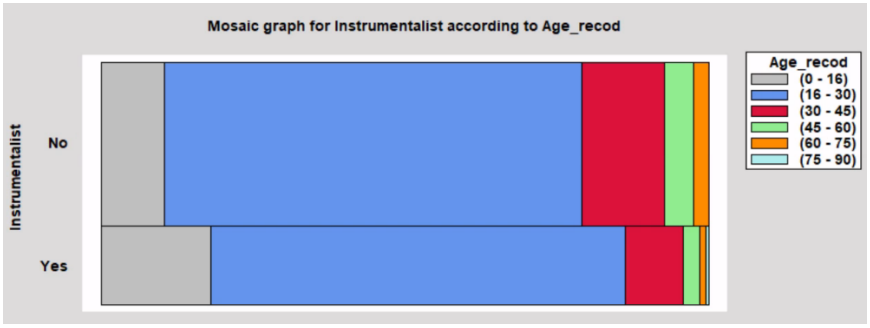

Figure 101

As expected, there are more non-instrumentalist (67,75%) than instrumentalists (32,25%). However the both kinf of indivuals share a similar distribution of age ranges, so the whole sample will be used.

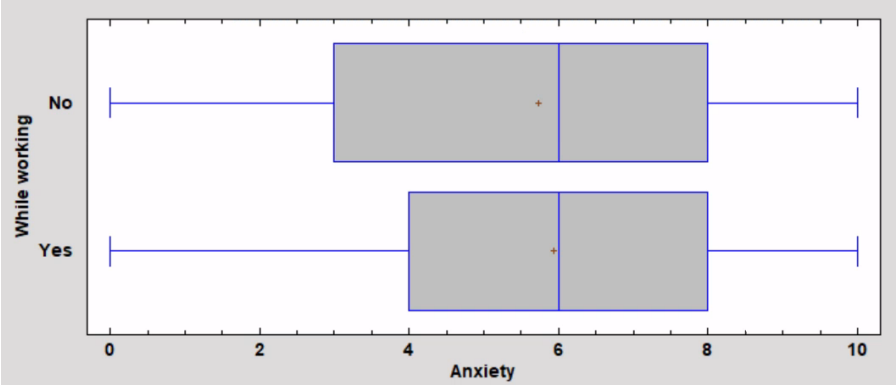

Figure 102

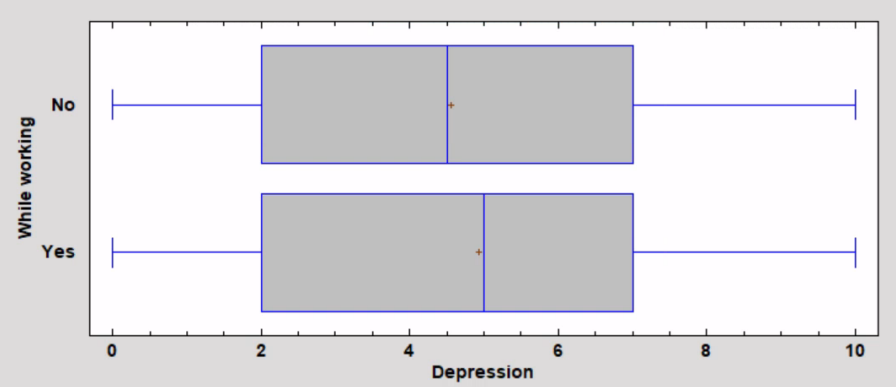

Figure 103

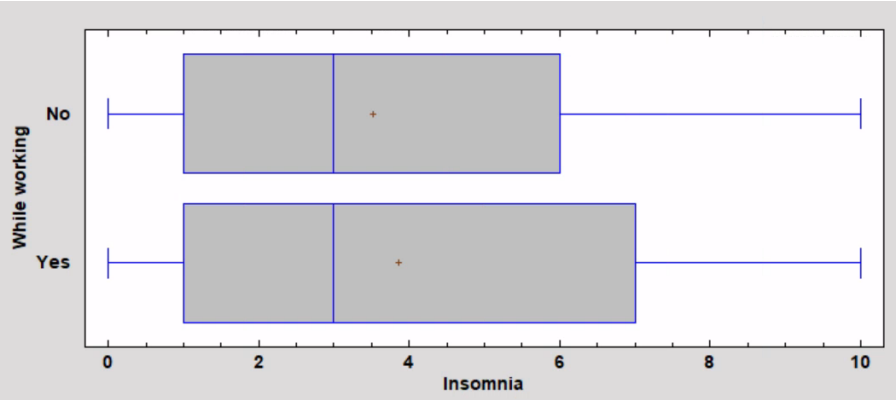

Figure 104

The only two factors that alter minimunly the **Instrumentalist**'s distribution are **Anxiety** and **Depression** although their couples have almost the same average. Again is not enough to determine a relationship. Descriptive parameters are brought to confirm the judgement.

Anxiety	Insomnia
Cramer's V 0,1102 Kendall 0,0378	Cramer's V 0,1170 Kendall 0,0506

Figure 105

The exposure to music to which an instrumentalist is oftenly subjected doesn't affect the trio.

Composer – anxiety/depression/insomnia

If being an instrumentalist does not affect, will being a composer affect the levels of **anxiety**, **depression** or **insomnia** at the time of listening to music? Firstly, let's compare the variable with the **age_recod**.

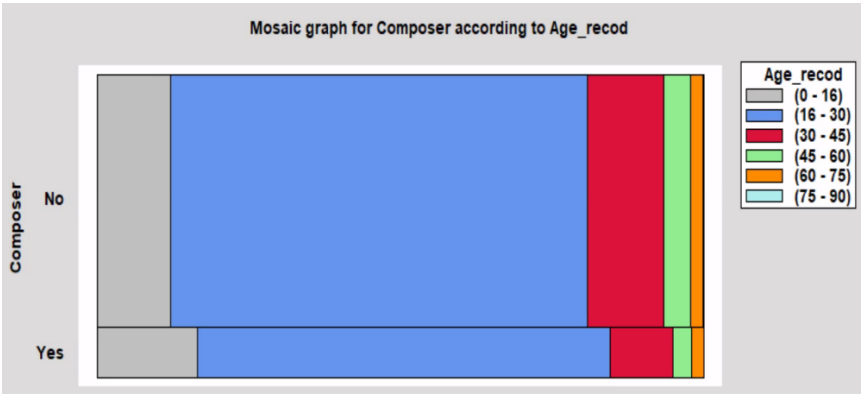

Figure 106

Just as thought, there are more composers (16,55%) than people who aren't (83,45%). Both Yes and No share approximately the same amount of values for every age range so the whole sample will be used.

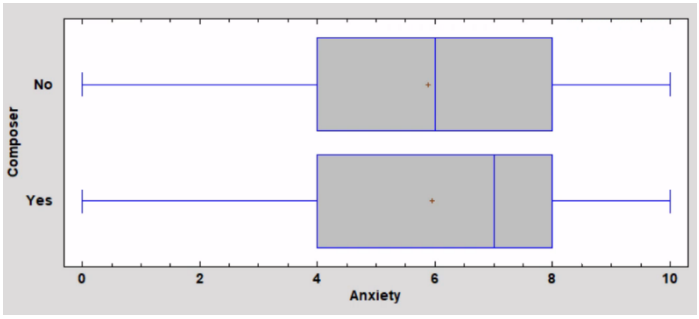

Figure 107

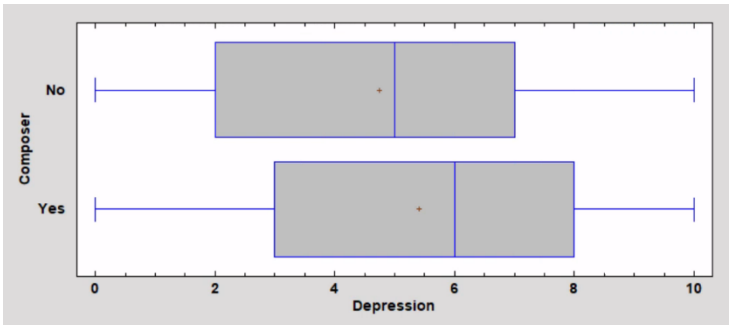

Figure 108

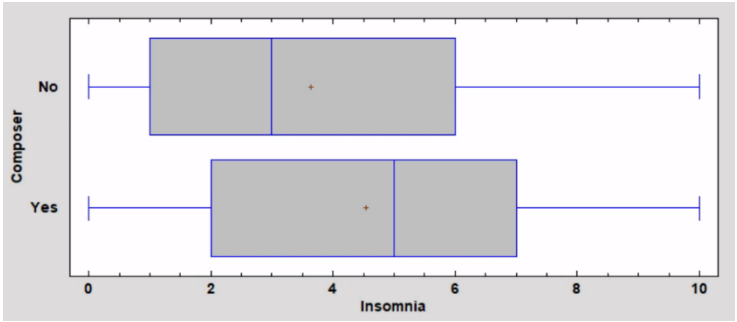

Figure 109

People who don't compose have 50 % of their **Depression** and **Insomnia** values in lower levels than the ones who compose. Besides, there's a difference in the average too as they are lower in the non-composer individuals. The difference is not enough as the descriptive parameters don't get close to 1 in either Cramer or Kendall.

Depression	Insomnia
Cramer's V 0,1171 Kendall 0,0726	Cramer's V Kendall

Figure 110

People who are more familiar to music like instrumentalists or composers have the same distribution in the variable trio than people who don't.