Exposing Egocentrism, Encouraging Ecocentrism - With Data

A Capstone paper submitted to Georgia College and State University in partial fulfillment of the requirements for the degree of Bachelor of Science in Mathematics

Megan Elizabeth Goetz, advised by Dr. Jebessa Mijena

December 17, 2018

Contents

Acknowledgement

First and foremost, I'd like to thank my advisor Dr. Jebessa Mijena for always believing in me and being patient with me. He was so open to my research ideas and encouraged me to pursue them. He also is to thank for my academic and career interest in data analysis, as his Probability class convinced me to finally change my major to math and his Linear Regression class was also one of my favorite and has shaped my career interests and goals, as well as my graduate school plans. I also would like to thank Dr. Mark Causey for not only his time and support as a volunteer to help me create my ecocentrism likert scale for the questions regarding compassion and other ethics elements, but his passion as an educator that allowed me to learn of ecocentrism in his classes. I also could not have done this without the two veterinarians at Animal Hospital in Milledgeville, Georgia on Columbia St. who volunteered their time to scale which options were best for the animal's physical, medical health for some of my other survey questions. This research was made possible upon the approval of my research application by the Georgia College Institutional Review Board. With this approval and the Georgia College Math Department's permission, I was able to conduct my own survey and obtain my own data; and so I thank them as well. I'd like to thank everyone who took the time to participate in my survey. Thank you Annie Peterson for helping me post about my survey and for being a great friend during this time. I also appreciate Gaston Sanchez, the author of the text book I referenced for this data analysis process, and am thankful for his accessible style of teaching through writing. And finally, I am grateful to those who supported me in other ways - including my mother, Rhonda Cornell and best friend, Colin Pennington, who were there for me at my public presentation of this material and functioned as my emotional support system throughout my time conducting this research, as well as Matt Dallas for being a great friend and helping me to not panic about things like coding and RStudio.

Abstract

This research includes an exploration of the survey-reported behavior that adult humans in the Georgia College community conduct towards the cats and/or dogs they live with and take care of. Models were constructed using PLS - PM (Partial Least Squares - Path Modeling), a technique utilized to form more complex models than one could with linear regression techniques. Most of the models propose that the capability the human reports to have in pertinence to their own hygiene, cleanliness, and physical health, for examples, as predictors of the efforts they have reported to make in taking care of the hygiene, cleanliness, and physical health of the nonhuman animal and that respective animal's living space. With our final model results, we can see which predictors are more significant than others, as well as understand how strongly connected both manifest variables are to their latent variables and latent variables are to each other. We are also able to identify potential inverse relationships.The motivation for this research is rooted in interest of whether humans have egocentric or ecocentric motives in living with cats and dogs.

Introduction

My first semester of college, the Environmental Science Club hosted a documentary showing of "Cowspiracy." As soon as I watched it, I became vegan - under a notion of environmentalism. This was the beginning of my journey to adopting ecocentrism. I took a couple of ethics classes in college, including Environmental Ethics and an animal ethics class, Thinking Animals. These classes are where I was introduced to the concept of ecocentrism (living in a way that considers what is best for all of the environment, nonhuman and human animals included), as opposed to logocentrism (living in a way that considers what is best for all of humanity) or egocentrism (living in a way that considers what is best for one's self). To elaborate, egocentrism is regarding yourself, as an individual, as the center of all things. So an egocentric philosophy ignores social causes, such as animal ethics efforts. Ethnocentrism is the perspective that regards all living beings as having intrinsic, inherent value. So their value isn't solely determined by their usefulness or importance to you. Someone who sees an animal as a source of comfort or entertainment, rather than an individual life with individual desires and needs, would have an egocentric perspective. Just as many deem it unethical for a human to use another human, an ecocentric person deems it unethical for a human animal to use a nonhuman animal.

For several years now, I have tried my best to adopt an ecocentric lifestyle. The core belief of my veganism is one of ecocentrism: to recognize and respect the autonomy of every animal, nonhuman and human. I have become interested in people's intentions with domestic nonhuman animal companions, as this is an area not investigated much. I think people do recognize some people are abusive to dogs and cats, but I believe we should be thinking about more than just active abuse. I believe we should explore whether humans are viewing these nonhuman animals as inherently valuable or instrumentally valuable. An ecocentric person would see a dog or cat as an individual with their own desires and wishes and a value of and in themselves. An ecocentric person would not primarily value an animal because that animal provides comfort, amusement, or some kind of service, even a sense of responsibility, to the person. To be ecocentric, one has to consciously strive for a mutual, symbiotic relationship, not with a consciousness that only focuses on how the dog or cat effects the person.This motivated me to ask people questions about how they treat the dogs and cats they live with. These philosophies are the basis for my research interests.

Thus, my main interests and goals for this research includes: - relationships between how humans take care of themselves and how they think of and take care of cats and dogs that they live with - seeing if we can use human's capability to take care of themselves, as well as the priorities in their own lives, as predictors of their efforts in taking care of cats/dogs - observing whether behaviors are inversely or directly correlated - maybe comparing humans' behavior with dogs to their behavior with cats

I will be presenting models created by partial least squares path modeling, based on reported behavior between humans the respective cats or dogs they lived with and discuss how some of my data results may suggest one has egocentric perspectives, while also encouraging the idea of ecocentrism.

Data Collection and Measurements

I posted a survey as a Google form called "What does living with a cat or dog mean to you?" onto Facebook 28 times. The survey has 59 questions. It was accessible for 2 months and 4 days by 18+ years old Georgia College Community members (faculty, staff, current students, alumni, involved with campus events or organizations) on 23 different Georgia-College-affiliated FB groups.There were 3 sections: one about the human's behavior with the dogs, one about the human's behavior with cats, and one about the human's behavior in regards to themselves. There were 103 participants.

The survey was posted on the following Facebook Groups: "Kitties of GCSU" (closed group), "Social Justice Warriors" (closed group), "Bobcat Exchange" (secret group) 5x, "The Adams Madams" (closed group), "GC's Earth"Officers" :0)" (secret group), "Environmental Science Club" (closed group), "GCSU Circle K" (closed group), "Boycott Capital Organizing" (secret group), "NARA average officers" (secret group), "Heckin Good Doggos of GCSU" (closed group), "Nonhuman Animal Rights Advocates" (closed group) 2x, "Boycott Capital" (closed group), "Georgia College Class of 2018" (closed group), "The Bobcat Growl" (public group), "GC AWM Chapter" (open group), "Bobcat Lost and Found" (open group), "Greenway Disc Pick-up" (public group), "GCSU Philosophy Club" (open group), "GC Math Club" (open group), "Spirit Gathering Community" (open group), "Georgia College Gardening Club" (closed group), "CATS - Georgia College" (open group)

So how did I measure ecocentrism and egocentrim with my data?

Most of my questions had response options with varying magnitudes of frequency for that activity or behavior. I then converted the different levels of frequency to a likert scale. My questions had two main categories: questions pertaining to what is best for the dog and/or cat - their physical, medical health - and questions pertaining to what is the most ethical and compassionate option to choose. To minimize the debates in appropriate scaling for ecocentrism, I took copies of my survey to Animal Hospital on Columbia St. in the town I live in, Milledgeville (in Georgia, "United States" of America) and asked if any veterinarians would volunteer to answer questions, rating which options were best for the animal. Two veterinarians volunteered. I also asked Dr. Mark Causey, a professor at Georgia College I had for several ethics classes, including the ones mentioned earlier, to rate which responses were most ecocentric and ethical. I converted the likert scale of varying magnitudes of frequency to a likert scale of varying magnitudes of ecocentrism, the higher the score, the more ecocentric the option - the lower the score, the more egocentric the option.

You can also view the full survey at the end of this paper.

Here are the first 4 questions of Part 1 of the survey and their respective ecocentric scales, for example:

3. On average, how often did you walk the dog outside?

- Once a day (4)
- Once a week (3)
- Once a month (2)
- Every now and then (less frequent than once a month) (1)

4. Approximately how often did you dress them up for holidays, such as Halloween, Christmas, et cetera?

- Never (4)
- Sometimes (less than 5 times a year) (3)
- Often (5 or more times a year) (2)
- Always (whenever I got a chance) (1)

5. Approximately how often did you buy them the same dog food?

- Always the same kind (4)
- Usually the same 1-2 kind(s) (3)
- Usually a different kind [alternate among 4-5 kinds] (2)
- Always a different kind [always trying something new] (1)

6. How often did they see a vet?

- Once or more a year (4)
- Once every couple/few years (3)
- Less than once every three years (2)
- Once/Twice ever (1)

The 3rd section asked details about the human themselves, such as how often they are outdoors, how often they exercise, and their income.

Modeling, Results, and Discussion

```
library(plspm)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(psych)
```

```
##
## Attaching package: 'psych'
```

```
## The following objects are masked from 'package:plspm':
##
##     alpha, rescale, unidim
```

Below, is what my data looks like. I have a total of 58 questions on my survey, but more than 58 columns due to how I chose to both understand and organize my data, such as a column to reference when converting inherently categorical values to a likert scale, or adding a column next to a particular question with the inverse of its original scale, in effort to make a negative loading positive. I will discuss loadings later.

```
##     alum current.student faculty campus.organizations campus.events staff
## 108    0               1       0                    0             0     0
## 109    0               1       0                    0             0     0
## 110    1               0       0                    0             0     0
## 111    0               1       0                    0             0     0
## 112    0               0       1                    0             0     0
## 113    0               1       0                    0             0     0
##
## 108
## 109       current student;involved in one or more GC clubs, organizations, sororities/fraternities, s
## 110
## 111 current student;staff;involved in one or more GC clubs, organizations, sororities/fraternities, s
## 112
## 113       current student;involved in one or more GC clubs, organizations, sororities/fraternities, s
##     NumQ1 NumQ2 NumQ3 NumQ4 dog.insurance Neg5    NumQ6 NumQ7 NumQ8 NumQ9
## 108     4     3     3     4             0      left out     4     4     3
## 109     1     4     3     3             0           of     3     4     3
## 110                                             data
## 111     4     3     3     4             0  Yes analysis     3     4     4
## 112
## 113
##     CatQ10 NumQ11 CatQ12 CatQ13 NumQ14 CatQ15 NumQ16 NumQ17 NumQ18 CatQ19
## 108      2      2      3      3      4      2      4      4      4      4
## 109      2      4                            2      4      2      2      4
## 110
## 111      2      4      3             4      2      4      3      3
## 112                                                                    5
```

```
## 113
##        CatQ20    CatQ21    CatQ22 NumQ23 NumQ24 NumQ25 NumQ26 Neg26
## 108      will      will      will
## 109        do        do        do             4      4      3     2
## 110   summary   summary   summary                    4      3     2
## 111 statistic statistic statistic             4      4      3     2
## 112                                           4      3     2
## 113                                           4      4      3     2
##         NumQ27 cat.insurance Neg28 NumQ29 Neg29 NumQ30 CatQ31 Neg31
## 108        not
## 109 consistent             0   yes      1     4      4      2     1
## 110       with             0   yes      4     1      4      2     1
## 111      other             0   yes      4     1      4      2     1
## 112    answers             0   yes      4     1      4      2     1
## 113                        0   yes      4     1      3      2     1
##         NumQ32 CatQ33 Neg33 CatQ34 Neg34 NumQ35 NumQ36 CatQ37 CatQ38 Neg38
## 108        not
## 109 consistent      3     1                          3             2     1
## 110       with      3     1      3     2      3                    2     1
## 111      other      3     1                          4             2     1
## 112    answers      3     1      3     1      2      4             2     1
## 113                 3     1                          4             2     1
##         NumQ39 NumQ40 Neg40 NumQ41 CatQ42   CatQ43 NumQ44 NumQ45 NumQ46
## 108        not                    3                      1      3      4
## 109 consistent      3     2      4      4 $65,000       4      4      3
## 110       with      4     1      4      5    20000      3      4      3
## 111      other      4     1      4      5               4      4      3
## 112    answers      4     1      4         150,000      2      2      2
## 113                 4     1      3      4               4      2      3
##     NumQ47 human.insurance NumQ49 NumQ50 NumQ51 NumQ52 NumQ53 NumQ54
## 108      4               1      2      4      4      4      4      4
## 109      4               1      4      3      3      2      3      3
## 110      4               1      4      4      4      4      4      4
## 111      4               1      3      4      1      3      3      4
## 112      4               1      4      3      3      3      3      2
## 113      4               1      4      3      3      3      4      2
##     NumQ55 NumQ56 NumQ57 NumQ58
## 108      4      4      2      3
## 109      3      4      2      1
## 110      3      4      2      2
## 111      4      4      3      4
## 112      2      4      1      1
## 113      3      4      2      1
```

First, I will make sure the following binary, categorical variables will indeed be treated as factor variables in Rstudio: cat.insurance, dog.insurance, and human.insurance.

```
attach(final.Data2)

as.factor(cat.insurance)
```

```
##   [1]   0 0 0 0 0 0   0   0   0 0 0 0 0 1       0 0 0 0 1 0 0 0   0 0 0   1
##  [36] 0   0     0 0   1   0   0 0 0 0 0 0 0   0 1 1 0 0   0   0 0         0
##  [71]   0 0 0 0 0   0   0   0 1     0       0     0     0   0   0   0 0
## Levels:  0 1 cat.insurance no yes
```

```
as.factor(dog.insurance)
```

```
##   [1] 0 0   0       0 0 0   0 0 0   0 1 0 0 0   0 0 0 1 0 0 0 0 0 0 0 0   0
##  [36]   0 0 0 0   0 1 1 1 0 1 0   0 0     0   1 1     0 0       0 0 0 0 0
##  [71] 0 0 0 0 0 0 0 0 0 0       0 0 0 0 0 0 1   0 0 0   0   0 0 1 0 0 0 0
## Levels:  0 1 dog.insurance No Yes
```

```
as.factor(human.insurance)
```

```
##   [1] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 0 0 1 1 1 0 1 1 1 1 1 1 1 1 1 1
##  [36] 1   1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 1 1   1
##  [71] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0     1 1 1 1 1 1 1
## Levels:  0 1 human.insurance No Yes
```

I have created 6 models with this Partial Least Squares Path Modeling. Note that 4 of the 6 models examine the behavior of a human Georgia College community member (18 years or older) in regards to their own life, in relationship to the behavior they exhibit in regard to the cat(s) and/or dog(s) they have both lived with and been the primary caregiver of. I am mainly interested in utilizing the reported behavior of the human as a predictor of the behavior with the nonhuman animal, but 2 of my models use different latent variables related to behavior with the nonhuman animal as predictors and response variables, for the sake of relationship analysis.

The subjects were told to answer all survey questions with only one dog in mind for the survey section that pertained to dogs (the 1st section) and/or only one cat in mind for the survey section that pertained to cats (the 2nd section) to ensure consistency with their responses as much as possible, as a person could have had very different relationships with one cat or dog depending on the point in time, et cetera.

The first one we will look at is the relationship between how a human prioritizes and participates in their own physical activity and health with how they prioritize and involve themselves with the health and physical activity of the dog and/or cat - MODEL 1.

For each model, the first step is to create a path matrix. This is where you tell Rstudio which relationships you are interested in. If I believe one variable will be a predictor of another and am trying to test that, I will put a 1 in the intersection of the two variables in the matrix. I am curious about almost every relationship between any two variables, so you will see I put all 1's where possible. Each matrix has to have an upper right triangle of 0's and be a square matrix.

I will talk through what the code and associated visuals mean in creating and prepping model 1. For the remaining 5 models, I will only discuss the results of each model, rather than explaining the creation of the model since the understanding of the coding and preparation for model 1 can be applied to the other 5, to avoid redundancy.

```
# MODEL 1

#path_matrix

human.physical.activity.health                      = c(0,0)
physical.activity.health.effort.for.animal          = c(1,0)

model1 = rbind(human.physical.activity.health,physical.activity.health.effort.for.animal)

colnames(model1) = rownames(model1)
```

Above, we only referenced the latent variables in the model. The measure of the relationships between each of these variables is called a "path coefficient." This is why this is called a path matrix. Below, I will now define which manifest variables each latent variable will reflect. For example, the overall score any particular survey participant receives in the human.physical.activity.health latent construct will reflect what kind of score they would get for each individual question (manifest variable). For this latent construct, #46 - how

often the human took strolls by themselves/with other humans, #55 - how often the human is outdoors, #56 - how often they exercise, were the manifest variables. Notice these numbers are different than the 60, 60, 70, and 71 you see in the code. These numbers are different solely because of the additional columns added in the excel sheet with my data, used for data organization mentioned earlier. The numbers represent the same questions still.

The "A" you see referenced as a mode type in the code, means my latent variables are reflective, rather than formative (meaning each individual manifest variable makes up the latent variable, such as the several grade categories that make up a final grade in a class.)

```
model1_blocks = list(c(60,69,70,71),c(8,10,31,32))

model1_modes = c("A","A")
```

Before producing almost all the results we could want in our data analysis, we need to make sure the requirements are satisfied to be able to carry on this type of modeling. There are requirements for both the inner (structural) model and the outer (measurement) model. The inner model focuses on the latent variables; the outer model focuses on the manifest variables.

First, we will look at our structural, inner model validity.

```
model1_pls = plspm(final.Data2,model1,model1_blocks,modes=model1_modes)
summary(model1_pls$unidim)
```

```
##  Mode       MVs       C.alpha           DG.rho          eig.1st
##  A:2   Min.   :4   Min.   :0.4734   Min.   :0.6084   Min.   :1.822
##        1st Qu.:4   1st Qu.:0.5585   1st Qu.:0.6759   1st Qu.:2.012
##        Median :4   Median :0.6435   Median :0.7434   Median :2.202
##        Mean   :4   Mean   :0.6435   Mean   :0.7434   Mean   :2.202
##        3rd Qu.:4   3rd Qu.:0.7285   3rd Qu.:0.8109   3rd Qu.:2.393
##        Max.   :4   Max.   :0.8135   Max.   :0.8784   Max.   :2.583
##     eig.2nd
##  Min.   :0.6945
##  1st Qu.:0.8501
##  Median :1.0057
##  Mean   :1.0057
##  3rd Qu.:1.1613
##  Max.   :1.3169
```

The Chronbach's Alpha is generally accepted if it is greater than 0.7. This alpha represents how well the manifest variables measure their latent variable: the average inter-variable correlation. For this model, it is .6435, which is not too off from the standard rule-of-thumb, so we will accept it. The Dillon-Goldstein's Rho is greater than .07, so this is indubitably satisfied. It measures the variance of the sum of each manifest variable (elaborates on how much a latent variable reflects its manifest variables). The first eigenvalue is greater than 1 as typically mandated, but our 2nd eigenvalue is not less than 1, as generally mandated, so this is a little questionable.

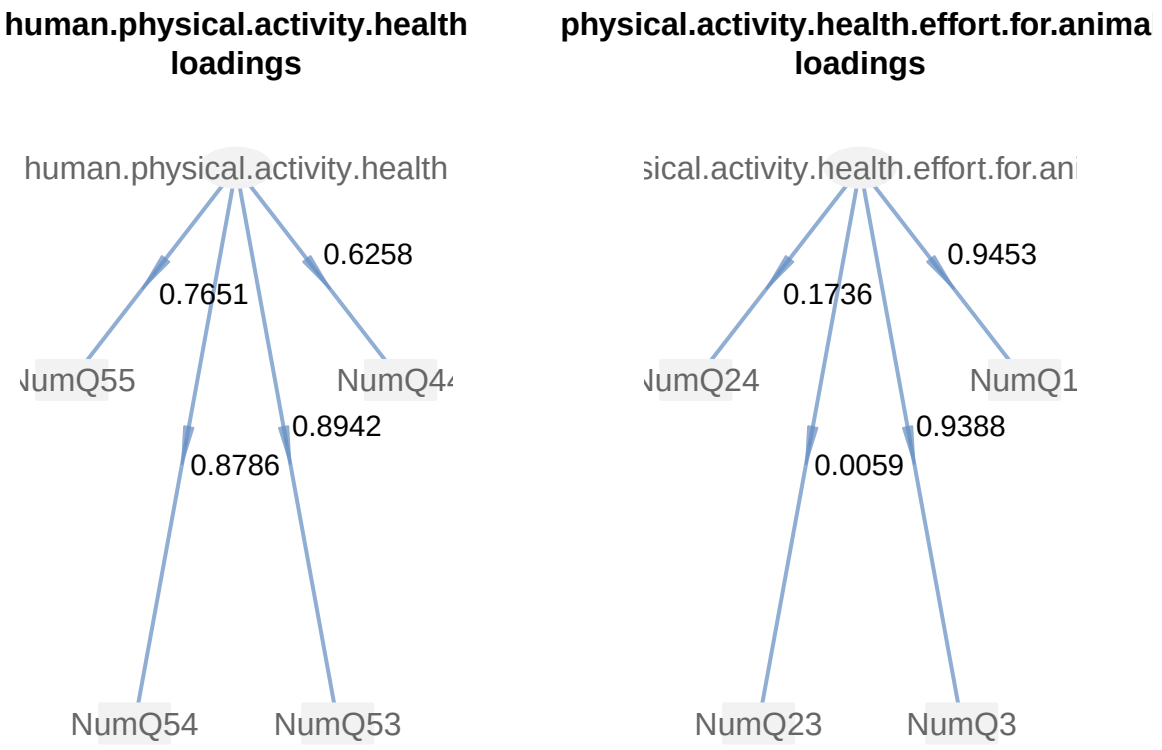
Most of these are essentially met, so we will generally conclude that our manifest variables seem to reflect the latent variables fairly well. Note that most of my other models meet these requirements even better and fully, so as you read on, you will see some stronger models.

These 3 measures, Chronbach's Alpha, Dillon-Goldstein's Rho, and the eigenvalue analysis, all measure unidimensionality - the idea that your manifest variables are so heavily correlated with their respective latent variables that it's like they're in one dimension since they're ideally going in the same direction, the same path. With the assumption or calculation of unidemnsionality, we can view our latent variables as valid.

Furthermore, to look at both the validity and strength of our overall auxiliary model, we want to look at the loadings each latent variable produces upon each of its manifest variables. Thus, the loading is understood as

the correlation coefficient of a latent variable as the predictor of the respective manifest variable. Typically, a loading higher than .07 is unquestioned and automatically accepted. When a loading is less than 0.7, we need to consider whether the manifest variable belongs to this latent variable of if perhaps it has a better fit with a different latent variable. With a positive loading, the manifest variables is deemed to provide information to the defined latent variable, regardless of if it fits better with a different construct.

```
plot(model1_pls, what = "loadings", arr.width = 0.1)
```



We see that NumQ23 (how often they walk the dog) and NumQ24 (putting them outside manually without a leash [in the yard for example]) both have loadings significantly less than 0.7. However, we know these two variables have little to nothing to do with any of my other constructed latent variables, so we will keep these since they still provide some information, even if minuscule.

Now let's examine NumQ44 (how often a human takes strolls by themselves or with other humans). We must ask ourselves the same question as the previously mentioned two, since the loading is less than 0.7. However, we will get the same conclusion.

It is always useful to think about why certain potential manifest variables produced had negative loadings produced by its originally constructed latent variable. In this model, the strength of the variety in food the human bought for a cat was significantly different from the strength of variety in food a human chooses for a dog, for participants in my study. Little variety is typically healthier for cats and dogs than a lot of variety, to give you some context as to how this has to do with health. While this question could then not be included with this latent variable, as it had a negative loading, for some reason(s) how often the human let the cat in and out or walked the cat and how often they walked the dog were similar had a similar enough nature in their response pattern that these all had positive loadings produced under the same latent variable. Why does the human's care of the physical health of the animal differ in food variety purchases?

We can state the following eight equations:

1. (frequency.strolls - NumQ44) = .6258(human.physical.activity.health) + error
2. (frequency.outdoors - NumQ53) = .8942(human.physical.activity.health) + error
3. (frequency.exercise - NumQ54) = .8786(human.physical.activity.health) + error
4. (frequency.eating.healthy - NumQ55) = .7651(human.physical.activity.health) + error
5. (frequency.dog.walking - NumQ1 = .9453(physical.activity.health.for.animal) + error
6. (strength.variety.dog.food - NumQ3) = .9388(physical.activity.health.for.animal) + error
7. (frequency.cat.walking - NumQ23) = .0059(physical.activity.health.for.animal) + error
8. (frequency.letting.cat.out. - NumQ24) = .1736(physical.activity.health.for.animal) + error

Because we can interpret these loadings as a correlation coefficient, we can thus interpret loadings-squared as we would interpret r-squared in linear regression:

About 39.16% of the variability in how frequently the human takes strolls by themselves or with other humans is explained by the latent human.physical.activity.health.

Now we may make conclusions based on our results, with confidence.

```
summary(model1_pls)
```

```
## PARTIAL LEAST SQUARES PATH MODELING (PLS-PM)
##
## ---------------------------------------------------------
## MODEL SPECIFICATION
## 1   Number of Cases      103
## 2   Latent Variables     2
## 3   Manifest Variables   8
## 4   Scale of Data        Standardized Data
## 5   Non-Metric PLS       FALSE
## 6   Weighting Scheme     centroid
## 7   Tolerance Crit       1e-06
## 8   Max Num Iters        100
## 9   Convergence Iters    6
## 10  Bootstrapping        FALSE
## 11  Bootstrap samples    NULL
##
## ---------------------------------------------------------
## BLOCKS DEFINITION
##                                        Block         Type   Size   Mode
## 1               human.physical.activity.health    Exogenous      4      A
## 2   physical.activity.health.effort.for.animal   Endogenous      4      A
##
## ---------------------------------------------------------
## BLOCKS UNIDIMENSIONALITY
##                                          Mode  MVs  C.alpha  DG.rho
## human.physical.activity.health              A    4    0.813   0.878
## physical.activity.health.effort.for.animal  A    4    0.473   0.608
##                                          eig.1st  eig.2nd
## human.physical.activity.health              2.58    0.694
## physical.activity.health.effort.for.animal  1.82    1.317
##
## ---------------------------------------------------------
## OUTER MODEL
##                                            weight  loading  communality
## human.physical.activity.health
##   1 NumQ44                                0.19020  0.62582     3.92e-01
##   1 NumQ53                                0.43082  0.89416     8.00e-01
```

```
##   1 NumQ54                                    0.40543  0.87857     7.72e-01
##   1 NumQ55                                    0.18240  0.76509     5.85e-01
## physical.activity.health.effort.for.animal
##   2 NumQ1                                     0.53497  0.94527     8.94e-01
##   2 NumQ3                                     0.49760  0.93879     8.81e-01
##   2 NumQ23                                   -0.00705  0.00591     3.49e-05
##   2 NumQ24                                    0.15675  0.17356     3.01e-02
##                                             redundancy
## human.physical.activity.health
##   1 NumQ44                                    0.00e+00
##   1 NumQ53                                    0.00e+00
##   1 NumQ54                                    0.00e+00
##   1 NumQ55                                    0.00e+00
## physical.activity.health.effort.for.animal
##   2 NumQ1                                     8.15e-02
##   2 NumQ3                                     8.04e-02
##   2 NumQ23                                    3.19e-06
##   2 NumQ24                                    2.75e-03
##
## ------------------------------------------------------------
## CROSSLOADINGS
##                                             human.physical.activity.health
## human.physical.activity.health
##   1 NumQ44                                                         0.62582
##   1 NumQ53                                                         0.89416
##   1 NumQ54                                                         0.87857
##   1 NumQ55                                                         0.76509
## physical.activity.health.effort.for.animal
##   2 NumQ1                                                          0.28942
##   2 NumQ3                                                          0.26918
##   2 NumQ23                                                        -0.00384
##   2 NumQ24                                                         0.08473
##                                             physical.activity.health.effort.for.animal
## human.physical.activity.health
##   1 NumQ44                                                                      0.13699
##   1 NumQ53                                                                      0.31029
##   1 NumQ54                                                                      0.29200
##   1 NumQ55                                                                      0.13137
## physical.activity.health.effort.for.animal
##   2 NumQ1                                                                       0.94527
##   2 NumQ3                                                                       0.93879
##   2 NumQ23                                                                      0.00591
##   2 NumQ24                                                                      0.17356
##
## ------------------------------------------------------------
## INNER MODEL
## $physical.activity.health.effort.for.animal
##                                  Estimate   Std. Error     t value
## Intercept                       -1.79e-16       0.0949   -1.89e-15
## human.physical.activity.health   3.02e-01       0.0949    3.18e+00
##                                 Pr(>|t|)
## Intercept                        1.00000
## human.physical.activity.health   0.00193
##
```

```
## ------------------------------------------------------------
## CORRELATIONS BETWEEN LVs
##                                            human.physical.activity.health
## human.physical.activity.health                                      1.000
## physical.activity.health.effort.for.animal                          0.302
##                                            physical.activity.health.effort.for.animal
## human.physical.activity.health                                                  0.302
## physical.activity.health.effort.for.animal                                      1.000
##
## ------------------------------------------------------------
## SUMMARY INNER MODEL
##                                                  Type      R2
## human.physical.activity.health                Exogenous  0.0000
## physical.activity.health.effort.for.animal  Endogenous  0.0913
##                                            Block_Communality
## human.physical.activity.health                         0.637
## physical.activity.health.effort.for.animal             0.451
##                                            Mean_Redundancy    AVE
## human.physical.activity.health                      0.0000  0.637
## physical.activity.health.effort.for.animal          0.0412  0.451
##
## ------------------------------------------------------------
## GOODNESS-OF-FIT
## [1]  0.2228
##
## ------------------------------------------------------------
## TOTAL EFFECTS
##                                                                  relationships
## 1  human.physical.activity.health -> physical.activity.health.effort.for.animal
##    direct  indirect  total
## 1   0.302         0  0.302
```

When looking at the inner model results, we see "Estimate," "Std. Error," "t value," and "Pr(>|t|)." Notice the p-values (rightmost column) greater than .05, with a 95% significance level, such as the human.physical.activity.health predictor for the response variable, physical.activity.health.effort.for.animal, in this model.

Variables with a p-value > .05 are deemed insignificant (correlation between the LV's is poor).

We can conclude with an equation to represent our inner model results:

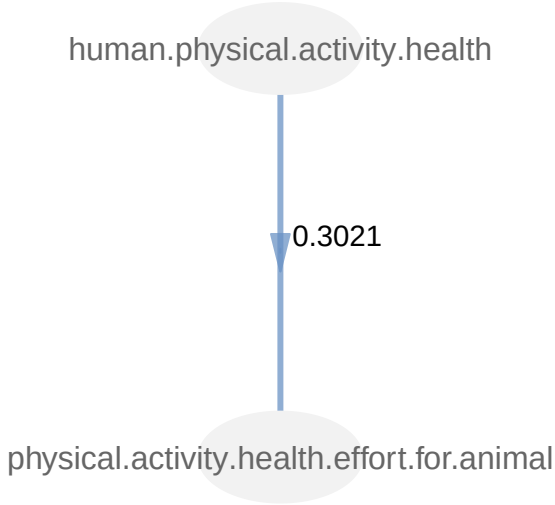
physical.activity.health.effort.for.animal = .302 (human.physical.activity.health)

Because I converted every nonbinary variable to a numeric, ecocentric scale, we would interpret this equation as follows:

For every additional one unit of frequency that the human puts their reported care of their own physical activity and health into action, the human's ecocentric score of how much effort they put into the physical activity and health of the nonhuman animal increases by .302.

We are able to represent the variables in this way, because the pls function generates a score for each latent variable and manifest variable. After the weight of each manifest variable was determined, the loadings of the latent variable upon each of its manifest variables is determined.

```
plot(model1_pls)
```



Human.physical.activity.health is a fairly strong predictor of physical.activity.health.effort.for.animal, for this type of modeling.

```
# MODEL 2

human.appearance.hygiene            = c(0,0)
animal.hygiene.comfort              = c(1,0)
# path matrix (inner model)

model2 = rbind(human.appearance.hygiene,animal.hygiene.comfort)
colnames(model2) = rownames(model2)
```

```
model2_blocks = list(c(61,66),c(9,16,17,18,19,20,21,23,24))

model2_modes = c("A","A")
```

```
model2_pls = plspm(final.Data2,model2,model2_blocks,modes=model2_modes)
```

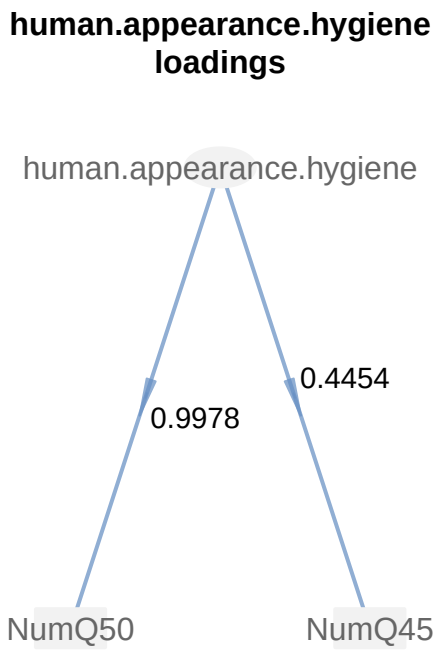
```
summary(model2_pls$unidim)
```

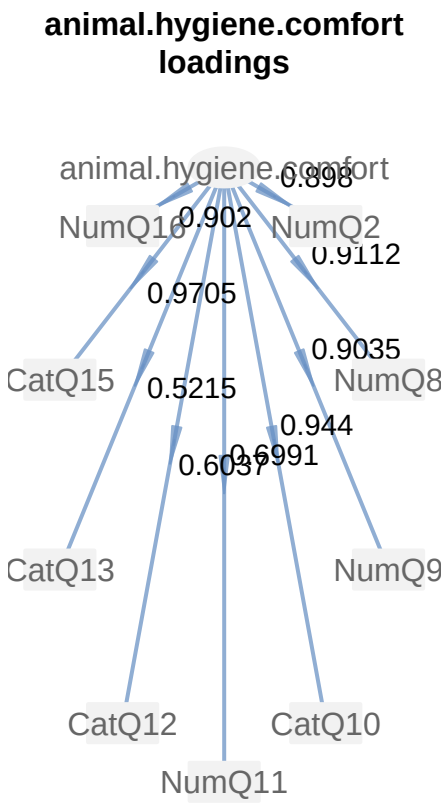
```
##  Mode       MVs          C.alpha          DG.rho          eig.1st
##  A:2   Min.   :2.00   Min.   :0.5566   Min.   :0.8185   Min.   :1.386
##        1st Qu.:3.75   1st Qu.:0.6523   1st Qu.:0.8518   1st Qu.:2.600
##        Median :5.50   Median :0.7480   Median :0.8851   Median :3.814
##        Mean   :5.50   Mean   :0.7480   Mean   :0.8851   Mean   :3.814
##        3rd Qu.:7.25   3rd Qu.:0.8437   3rd Qu.:0.9184   3rd Qu.:5.028
##        Max.   :9.00   Max.   :0.9394   Max.   :0.9517   Max.   :6.242
##     eig.2nd
```

```
##  Min.   :0.6144
##  1st Qu.:0.7630
##  Median :0.9116
##  Mean   :0.9116
##  3rd Qu.:1.0601
##  Max.   :1.2087
```

All unidimensionality metrics are undoubtedly satisfied! woohoo!

```
plot(model2_pls, what = "loadings", arr.width = 0.1)
```





NumQ11, CatQ12, CatQ13 are just barely less than .7. We can make the same conclusions as earlier. This 0.7 might not be achieved by these 3, because while hygiene can be a determinant of comfort, comfort isn't always a determinant of hygiene. So, the two together isn't a perfect grouping. That being sad, while it seems like there could be a little bit of a potential conceptual issue, or at least not a perfect conceptual construct. It is a nonissue, mathematically.

NumQ11 is the one of the 3 that people might debate does not belong to comfort too much, as NumQ11 pertains to how often the human lets the dog sleep with them. And CatQ12 and CatQ13 refer to where the dog sleeps if the human did not let the dog sleep with them and the dog didn't want to sleep with them or did want to, respectively. But notice how 11 is the one with the loading of .6991, which many would say satisfies the .7 requirement. CatQ12 and CatQ13 are more conceptually logical and straightforward as having to do with comfort for the animal, because they refer to where the animal gets to sleep. Even so, 0.5 and 0.6 are not too far off. And these two questions would not belong with any other latent variable of my survey and do still provide information.

Now let's look at NumQ45. Dressing up and dressing festively does not have to do with comfort to all humans, so it is understandable that the loading is only about .4454, but it would not fit better with any other latent construct and still provides information. Whereas Q50, about frequency of bathing unquestionably pertains

to comfort and hygiene, so the .9978 is unsurprising.

Notice that every question in the animal.hygiene.comfort latent variable pertains to dogs, not cats. This is because every version of this question pertinent to cats actually had a negative loading produce. This means that GC community members maybe seem to treat cats significantly different from dogs when it comes to these particular behaviors.

```
summary(model2_pls)
```

```
## PARTIAL LEAST SQUARES PATH MODELING (PLS-PM)
##
## ------------------------------------------------------------
## MODEL SPECIFICATION
## 1   Number of Cases      103
## 2   Latent Variables     2
## 3   Manifest Variables   11
## 4   Scale of Data        Standardized Data
## 5   Non-Metric PLS       FALSE
## 6   Weighting Scheme     centroid
## 7   Tolerance Crit       1e-06
## 8   Max Num Iters        100
## 9   Convergence Iters    5
## 10  Bootstrapping        FALSE
## 11  Bootstrap samples    NULL
##
## ------------------------------------------------------------
## BLOCKS DEFINITION
##                         Block         Type   Size   Mode
## 1   human.appearance.hygiene    Exogenous      2      A
## 2     animal.hygiene.comfort   Endogenous      9      A
##
## ------------------------------------------------------------
## BLOCKS UNIDIMENSIONALITY
##                            Mode  MVs  C.alpha  DG.rho  eig.1st  eig.2nd
## human.appearance.hygiene     A    2    0.557   0.819     1.39    0.614
## animal.hygiene.comfort       A    9    0.939   0.952     6.24    1.209
##
## ------------------------------------------------------------
## OUTER MODEL
##                            weight  loading  communality  redundancy
## human.appearance.hygiene
##   1 NumQ45                 0.0712    0.445        0.198      0.0000
##   1 NumQ50                 0.9704    0.998        0.996      0.0000
## animal.hygiene.comfort
##   2 NumQ2                  0.1608    0.898        0.806      0.0326
##   2 NumQ8                  0.1684    0.911        0.830      0.0336
##   2 NumQ9                  0.2232    0.903        0.816      0.0330
##   2 CatQ10                 0.1233    0.944        0.891      0.0361
##   2 NumQ11                 0.0790    0.699        0.489      0.0198
##   2 CatQ12                 0.0755    0.604        0.364      0.0148
##   2 CatQ13                 0.0778    0.522        0.272      0.0110
##   2 CatQ15                 0.1300    0.970        0.942      0.0381
##   2 NumQ16                 0.1291    0.902        0.814      0.0329
##
## ------------------------------------------------------------
```

```
## CROSSLOADINGS
##                            human.appearance.hygiene  animal.hygiene.comfort
## human.appearance.hygiene
##   1 NumQ45                                   0.4454                  0.0151
##   1 NumQ50                                   0.9978                  0.2062
## animal.hygiene.comfort
##   2 NumQ2                                    0.1897                  0.8980
##   2 NumQ8                                    0.1983                  0.9112
##   2 NumQ9                                    0.2629                  0.9035
##   2 CatQ10                                   0.1452                  0.9440
##   2 NumQ11                                   0.0928                  0.6991
##   2 CatQ12                                   0.0890                  0.6037
##   2 CatQ13                                   0.0915                  0.5215
##   2 CatQ15                                   0.1531                  0.9705
##   2 NumQ16                                   0.1520                  0.9020
##
## ------------------------------------------------------------
## INNER MODEL
## $animal.hygiene.comfort
##                              Estimate   Std. Error     t value   Pr(>|t|)
## Intercept                  -5.92e-17       0.0975   -6.08e-16     1.0000
## human.appearance.hygiene    2.01e-01       0.0975    2.06e+00     0.0416
##
## ------------------------------------------------------------
## CORRELATIONS BETWEEN LVs
##                            human.appearance.hygiene  animal.hygiene.comfort
## human.appearance.hygiene                      1.000                   0.201
## animal.hygiene.comfort                        0.201                   1.000
##
## ------------------------------------------------------------
## SUMMARY INNER MODEL
##                                  Type      R2  Block_Communality
## human.appearance.hygiene   Exogenous  0.0000              0.597
## animal.hygiene.comfort    Endogenous  0.0405              0.692
##                           Mean_Redundancy    AVE
## human.appearance.hygiene            0.000  0.597
## animal.hygiene.comfort              0.028  0.692
##
## ------------------------------------------------------------
## GOODNESS-OF-FIT
## [1]  0.1652
##
## ------------------------------------------------------------
## TOTAL EFFECTS
##                                        relationships  direct  indirect
## 1  human.appearance.hygiene -> animal.hygiene.comfort   0.201         0
##    total
## 1  0.201
```

animal.hygiene.effort = .201(human.appearance.hygiene)

For every additional one unit of frequency that the human puts their reported care of their own appearance and hygiene into action, the human's ecocentric score of how much effort they put into the appearance (and therefore comfort) and hygiene of the nonhuman animal increases by .201.

```
plot(model2_pls)
```

There seems to be a somewhat weak, positive correlation of human.appearance.hygiene predicting animal.hygiene.comfort.

```
# MODEL 3

human.medical.care                  = c(0,0,0,0,0,0)
human.insurance                     = c(1,0,0,0,0,0)
income                              = c(1,1,0,0,0,0)
animal.medical.care                 = c(1,1,1,0,0,0)
dog.insurance                       = c(1,1,1,1,0,0)
cat.insurance                       = c(1,1,1,1,1,0)

# path matrix (inner model)

model3 = rbind(human.medical.care, human.insurance,income,animal.medical.care,dog.insurance,cat.insuran
colnames(model3) = rownames(model3)
```

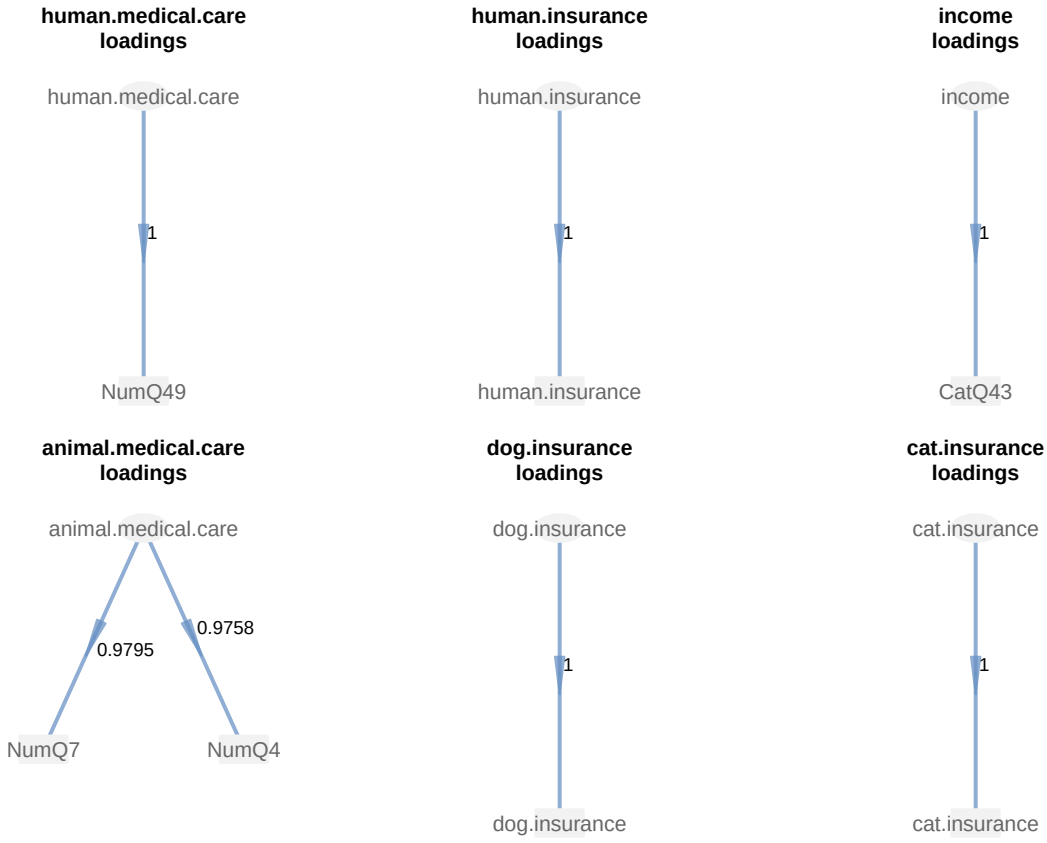
```
foot_blocks = list(65,64,59,c(11,15),12,37)

foot_modes = c("A","A","A","A","A","A")

model3_pls = plspm(final.Data2,model3,foot_blocks,modes=foot_modes)
```

```
summary(model3_pls$unidim)
```

```
##  Mode       MVs           C.alpha           DG.rho          eig.1st
##  A:6   Min.   :1.000   Min.   :0.9539   Min.   :0.9775   Min.   :1.000
##        1st Qu.:1.000   1st Qu.:1.0000   1st Qu.:1.0000   1st Qu.:1.000
##        Median :1.000   Median :1.0000   Median :1.0000   Median :1.000
##        Mean   :1.167   Mean   :0.9923   Mean   :0.9962   Mean   :1.152
##        3rd Qu.:1.000   3rd Qu.:1.0000   3rd Qu.:1.0000   3rd Qu.:1.000
##        Max.   :2.000   Max.   :1.0000   Max.   :1.0000   Max.   :1.912
##     eig.2nd
##  Min.   :0.00000
##  1st Qu.:0.00000
##  Median :0.00000
##  Mean   :0.01470
##  3rd Qu.:0.00000
##  Max.   :0.08821
```

All of these metrics are satisfied!

```
plot(model3_pls, what = "loadings", arr.width = 0.1)
```



All loadings > 0.7 !

The loading for the question regarding the frequency at which the human provides medicine/treatments the vet suggests for cats was negative.This means the pattern of responses was too different from medical treatment for dogs to be included in the latent variable, animal medical care. The two [manifest variables] would have to be highly correlated to be nested under the same latent variable. Note: rabies shot frequency and cat vet visit frequency was left out too, but of my data analysis overall - as these questions were inconsistent with all

other survey questions.

We can state the following two equations:

1. dog.vet.visits = .9758(animal.medical.care) + error
2. dog.medicine = .9795(animal.medical.care) + error

Note all other predictor variables (in this particular model) are directly measured, not subjectively measured, so their weights and loadings are 1.

About 95.22% of the variability in how frequently the human takes the dog to the vet is explained by the latent variable animal.medical.care. About 95.94% of the variability in how frequently the human provides the dog with medicine/treatment(s) the vet suggests is explained by the latent variable animal.medical.care.

```
summary(model3_pls)
```

```
## PARTIAL LEAST SQUARES PATH MODELING (PLS-PM)
##
## ------------------------------------------------------------
## MODEL SPECIFICATION
## 1   Number of Cases      103
## 2   Latent Variables     6
## 3   Manifest Variables   7
## 4   Scale of Data        Standardized Data
## 5   Non-Metric PLS       FALSE
## 6   Weighting Scheme     centroid
## 7   Tolerance Crit       1e-06
## 8   Max Num Iters        100
## 9   Convergence Iters    3
## 10  Bootstrapping        FALSE
## 11  Bootstrap samples    NULL
##
## ------------------------------------------------------------
## BLOCKS DEFINITION
##                   Block         Type   Size   Mode
## 1    human.medical.care    Exogenous      1      A
## 2       human.insurance   Endogenous      1      A
## 3                income   Endogenous      1      A
## 4   animal.medical.care   Endogenous      2      A
## 5         dog.insurance   Endogenous      1      A
## 6         cat.insurance   Endogenous      1      A
##
## ------------------------------------------------------------
## BLOCKS UNIDIMENSIONALITY
##                       Mode  MVs  C.alpha  DG.rho  eig.1st  eig.2nd
## human.medical.care       A    1    1.000   1.000     1.00   0.0000
## human.insurance          A    1    1.000   1.000     1.00   0.0000
## income                   A    1    1.000   1.000     1.00   0.0000
## animal.medical.care      A    2    0.954   0.977     1.91   0.0882
## dog.insurance            A    1    1.000   1.000     1.00   0.0000
## cat.insurance            A    1    1.000   1.000     1.00   0.0000
##
## ------------------------------------------------------------
## OUTER MODEL
##                       weight  loading  communality  redundancy
## human.medical.care
##   1 NumQ49            1.000    1.000        1.000      0.0000
```

```
## human.insurance
##   2 human.insurance   1.000    1.000        1.000      0.3217
## income
##   3 CatQ43            1.000    1.000        1.000      0.0448
## animal.medical.care
##   4 NumQ4             0.491    0.976        0.952      0.0626
##   4 NumQ7             0.532    0.979        0.959      0.0631
## dog.insurance
##   5 dog.insurance     1.000    1.000        1.000      0.6542
## cat.insurance
##   6 cat.insurance     1.000    1.000        1.000      0.2335
##
## ------------------------------------------------------------
## CROSSLOADINGS
##                      human.medical.care  human.insurance   income
## human.medical.care
##   1 NumQ49                       1.0000           0.5672   0.0955
## human.insurance
##   2 human.insurance              0.5672           1.0000   0.2098
## income
##   3 CatQ43                       0.0955           0.2098   1.0000
## animal.medical.care
##   4 NumQ4                        0.1195           0.0667  -0.1566
##   4 NumQ7                        0.1833           0.0866  -0.2049
## dog.insurance
##   5 dog.insurance                0.0491           0.0936  -0.1183
## cat.insurance
##   6 cat.insurance               -0.0807           0.2098   0.1671
##                      animal.medical.care  dog.insurance  cat.insurance
## human.medical.care
##   1 NumQ49                        0.1562         0.0491        -0.0807
## human.insurance
##   2 human.insurance               0.0788         0.0936         0.2098
## income
##   3 CatQ43                       -0.1859        -0.1183         0.1671
## animal.medical.care
##   4 NumQ4                         0.9758         0.7712        -0.3294
##   4 NumQ7                         0.9795         0.7919        -0.2976
## dog.insurance
##   5 dog.insurance                 0.7998         1.0000        -0.1181
## cat.insurance
##   6 cat.insurance                -0.3200        -0.1181         1.0000
##
## ------------------------------------------------------------
## INNER MODEL
## $human.insurance
##                       Estimate   Std. Error     t value   Pr(>|t|)
## Intercept           -3.27e-16       0.0819   -3.99e-15    1.0e+00
## human.medical.care   5.67e-01       0.0819    6.92e+00    4.2e-10
##
## $income
##                       Estimate   Std. Error     t value   Pr(>|t|)
## Intercept           -4.06e-17       0.0977   -4.16e-16     1.0000
## human.medical.care  -3.46e-02       0.1187   -2.92e-01     0.7712
```

```
## human.insurance       2.29e-01       0.1187    1.93e+00     0.0561
##
## $animal.medical.care
##                       Estimate   Std. Error     t value   Pr(>|t|)
## Intercept             5.32e-17       0.0971    5.47e-16     1.0000
## human.medical.care    1.57e-01       0.1180    1.33e+00     0.1860
## human.insurance       3.32e-02       0.1201    2.77e-01     0.7826
## income               -2.08e-01       0.0994   -2.09e+00     0.0391
##
## $dog.insurance
##                        Estimate   Std. Error     t value   Pr(>|t|)
## Intercept             -1.69e-16       0.0594   -2.84e-15   1.00e+00
## human.medical.care    -1.40e-01       0.0728   -1.92e+00   5.82e-02
## human.insurance        1.03e-01       0.0735    1.40e+00   1.64e-01
## income                 2.55e-02       0.0621    4.11e-01   6.82e-01
## animal.medical.care    8.18e-01       0.0615    1.33e+01   1.05e-23
##
## $cat.insurance
##                        Estimate   Std. Error     t value   Pr(>|t|)
## Intercept              4.42e-16       0.0889    4.97e-15   1.000000
## human.medical.care    -2.00e-01       0.1110   -1.80e+00   0.074425
## human.insurance        3.27e-01       0.1111    2.94e+00   0.004046
## income                 5.16e-02       0.0930    5.55e-01   0.580349
## animal.medical.care   -5.52e-01       0.1541   -3.58e+00   0.000542
## dog.insurance          3.08e-01       0.1512    2.04e+00   0.044118
##
## ------------------------------------------------------------
## CORRELATIONS BETWEEN LVs
##                       human.medical.care  human.insurance   income
## human.medical.care                1.0000           0.5672   0.0955
## human.insurance                   0.5672           1.0000   0.2098
## income                            0.0955           0.2098   1.0000
## animal.medical.care               0.1562           0.0788  -0.1859
## dog.insurance                     0.0491           0.0936  -0.1183
## cat.insurance                    -0.0807           0.2098   0.1671
##                       animal.medical.care  dog.insurance  cat.insurance
## human.medical.care                 0.1562         0.0491        -0.0807
## human.insurance                    0.0788         0.0936         0.2098
## income                            -0.1859        -0.1183         0.1671
## animal.medical.care                1.0000         0.7998        -0.3200
## dog.insurance                      0.7998         1.0000        -0.1181
## cat.insurance                     -0.3200        -0.1181         1.0000
##
## ------------------------------------------------------------
## SUMMARY INNER MODEL
##                            Type      R2  Block_Communality
## human.medical.care     Exogenous  0.0000              1.000
## human.insurance       Endogenous  0.3217              1.000
## income                Endogenous  0.0448              1.000
## animal.medical.care   Endogenous  0.0658              0.956
## dog.insurance         Endogenous  0.6542              1.000
## cat.insurance         Endogenous  0.2335              1.000
##                       Mean_Redundancy    AVE
## human.medical.care             0.0000  1.000
```

```
## human.insurance               0.3217  1.000
## income                        0.0448  1.000
## animal.medical.care           0.0629  0.956
## dog.insurance                 0.6542  1.000
## cat.insurance                 0.2335  1.000
##
## ------------------------------------------------------------
## GOODNESS-OF-FIT
## [1]  0.5023
##
## ------------------------------------------------------------
## TOTAL EFFECTS
##                                  relationships   direct   indirect    total
## 1       human.medical.care -> human.insurance   0.5672   0.000000   0.5672
## 2                human.medical.care -> income  -0.0346   0.130105   0.0955
## 3   human.medical.care -> animal.medical.care   0.1571  -0.000992   0.1562
## 4         human.medical.care -> dog.insurance  -0.1395   0.188608   0.0491
## 5         human.medical.care -> cat.insurance  -0.2001   0.119463  -0.0807
## 6                   human.insurance -> income   0.2294   0.000000   0.2294
## 7      human.insurance -> animal.medical.care   0.0332  -0.047675  -0.0144
## 8            human.insurance -> dog.insurance   0.1030  -0.005956   0.0970
## 9            human.insurance -> cat.insurance   0.3271   0.049706   0.3768
## 10              income -> animal.medical.care  -0.2078   0.000000  -0.2078
## 11                    income -> dog.insurance   0.0255  -0.170062  -0.1445
## 12                    income -> cat.insurance   0.0516   0.070059   0.1217
## 13       animal.medical.care -> dog.insurance   0.8182   0.000000   0.8182
## 14       animal.medical.care -> cat.insurance  -0.5515   0.252280  -0.2992
## 15             dog.insurance -> cat.insurance   0.3083   0.000000   0.3083
```

human.insurance = .567(human.medical.care) income = -.0346(human.medical.care) + .229(human.insurance) animal.medical.care = .157(human.medical.care) + .0332(human.insurance) - .208(income) dog.insurance = -.14(human.medical.care) + .103(human.insurance) + .0255(income) + .818(animal.medical.care) cat.insurance = - .2(human.medical.care) + .327(human.insurance) + .0516(income) - .552(animal.medical.care) + .308(dog.insurance)

For these more complex models, I will only explicitly note the relationships that have a path coefficient > |0.3|. Relationships with a path coefficient greater than |0.3| is deemed pretty strong for this kind of path modeling. For this model, these include:

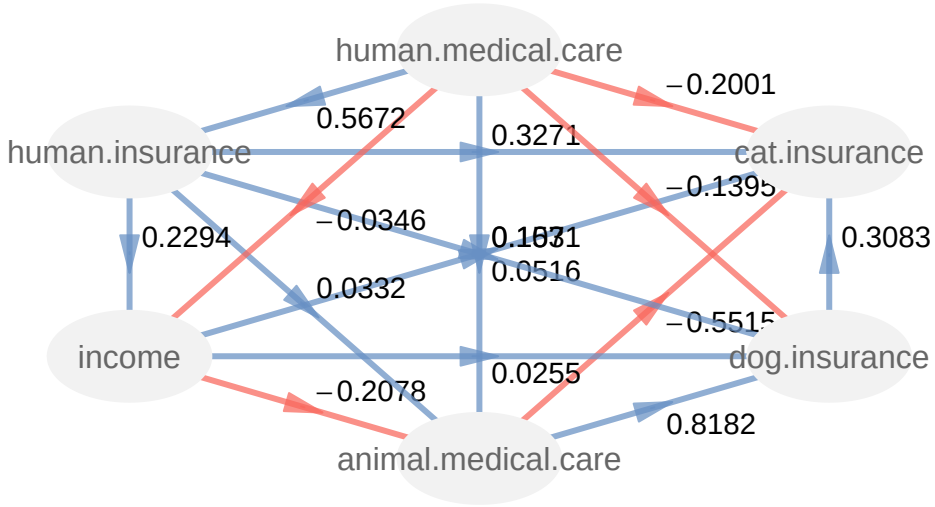
dog.insurance -> cat.insurance; .3083 (uninteresting) animal.medical.care -> dog.insurance; .8182 (unsurprising) human.medical.care -> human.insurance; .5622 (unsurprising) human.insurance -> cat.insurance; .3271 (interesting) animal.medical.care -> cat.insurance; -.5515 (interesting)

Notice that whether or not a human gets insurance for themselves has a fairly strong relationship with whether they do for a cat or not, but not with whether or not they do for a dog. It's also interesting that the more effort they put into medical care for the dog, the less likely they are to have insurance for the cat. This could be for a number of reasons. A few possible explanations include: humans might observe domestic dogs to be more energetic, aggressive, and therefore more at-risk than cats; humans likely take domestic dogs outside more than cats, putting the dogs more at risk than cats; if more money is going towards medical treatment for dogs, less is going towards medical care for cats; or maybe high effort in medical treatment and vet visits for dogs indicates they generally take good care of nonhuman animals and find insurance unnecessary.

I will also discuss any interesting negatively correlated relationships for these more complex models. To someone who is aware of sociological issues such as poverty, it maybe wouldn't be totally unsurprising that the more someone spends on medical treatments and doctor visits, the less income they have - as poorer folks

tend to have worse health, although usually this is in result of not having the funds to get medical care. This leaves me with a contradictory analysis. However, are survey subjects were mostly current students. So, I'm not surprised if many of these subjects have low-income as students and have their parents paying for their medical care. The more effort a human in this study put into medical care for themselves, the less likely they were to have insurance for the cat or dog they lived with. This could be a symptom of collective egocentrism, or it could be as simple as they have medical needs and not enough to invest in insurance, something that is more precautionary, rather than a treatment. Also interesting, the higher one's income was, the less effort they put towards medical care for the dog. This could also be a collective symptom of egocentrism. Maybe a person with higher income would be able to provide a safer, healthier environment for a dog and therefore does not provide much medical care for the dog, perhaps a less pessimistic view.

```
plot(model3_pls)
```




```
# MODEL 4

human.cleanliness                = c(0,0)
cleanliness.for.animal           = c(1,0)
# path matrix (inner model)

model4 = rbind(human.cleanliness, cleanliness.for.animal)
colnames(model4) = rownames(model4)
```

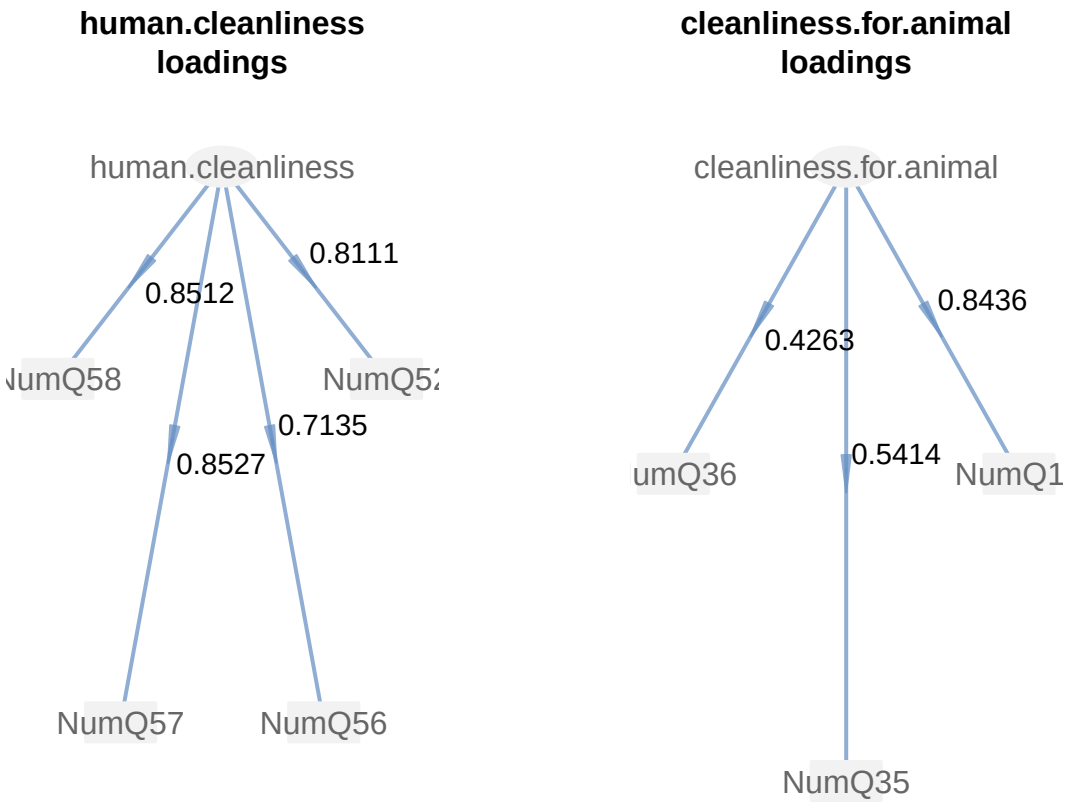
```
foot_blocks = list(c(68,72,73,74),c(22,49,50))

foot_modes = c("A","A")

model4_pls = plspm(final.Data2,model4,foot_blocks,modes=foot_modes)
```

```
summary(model4_pls$unidim)
```

```
##  Mode       MVs          C.alpha          DG.rho          eig.1st
##  A:2   Min.   :3.00   Min.   :0.4226   Min.   :0.6946   Min.   :1.563
##        1st Qu.:3.25   1st Qu.:0.5246   1st Qu.:0.7429   1st Qu.:1.837
##        Median :3.50   Median :0.6267   Median :0.7911   Median :2.110
##        Mean   :3.50   Mean   :0.6267   Mean   :0.7911   Mean   :2.110
##        3rd Qu.:3.75   3rd Qu.:0.7288   3rd Qu.:0.8394   3rd Qu.:2.384
##        Max.   :4.00   Max.   :0.8308   Max.   :0.8876   Max.   :2.657
##     eig.2nd
##  Min.   :0.6548
##  1st Qu.:0.7427
##  Median :0.8306
##  Mean   :0.8306
##  3rd Qu.:0.9184
##  Max.   :1.0063
```

Cronbach's Alpha just misses 0.7 with a value of .6267! All other metrics are indubitably satisfied.

```
plot(model4_pls, what = "loadings", arr.width = 0.1)
```



Let's look at NumQ35 NumQ36. NumQ35 and NumQ14 are the same question (one for dogs, one for cats); NumQ36 is different though since it has to do with upkeep of litterbox, not sleeping space like the other two.

For the human latent variable, all manifest variables have loadings > .7: frequency of sleeping space upkeep, frequency of hygiene routines, frequency of cleaning house, frequency of cleaning bedroom. These are all high because it's all just about the one human and their cleanliness of themselves/materials for own bodily use. It's not a variable representing behavior with both cats and dogs.

```
summary(model4_pls)
```

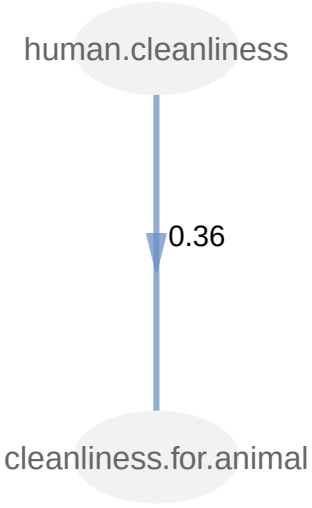
```
## PARTIAL LEAST SQUARES PATH MODELING (PLS-PM)
##
## ---------------------------------------------------------
## MODEL SPECIFICATION
## 1   Number of Cases      103
## 2   Latent Variables     2
## 3   Manifest Variables   7
## 4   Scale of Data        Standardized Data
## 5   Non-Metric PLS       FALSE
## 6   Weighting Scheme     centroid
## 7   Tolerance Crit       1e-06
## 8   Max Num Iters        100
## 9   Convergence Iters    7
## 10  Bootstrapping        FALSE
## 11  Bootstrap samples    NULL
##
## ---------------------------------------------------------
## BLOCKS DEFINITION
##                       Block          Type   Size   Mode
## 1        human.cleanliness    Exogenous      4      A
## 2   cleanliness.for.animal   Endogenous      3      A
##
## ---------------------------------------------------------
## BLOCKS UNIDIMENSIONALITY
##                          Mode  MVs  C.alpha  DG.rho  eig.1st  eig.2nd
## human.cleanliness           A    4    0.831   0.888     2.66    0.655
## cleanliness.for.animal      A    3    0.423   0.695     1.56    1.006
##
## ---------------------------------------------------------
## OUTER MODEL
##                          weight  loading  communality  redundancy
## human.cleanliness
##   1 NumQ52               0.408    0.811        0.658      0.0000
##   1 NumQ56               0.136    0.713        0.509      0.0000
##   1 NumQ57               0.340    0.853        0.727      0.0000
##   1 NumQ58               0.332    0.851        0.725      0.0000
## cleanliness.for.animal
##   2 NumQ14               0.832    0.844        0.712      0.0922
##   2 NumQ35               0.350    0.541        0.293      0.0380
##   2 NumQ36               0.256    0.426        0.182      0.0236
##
## ---------------------------------------------------------
## CROSSLOADINGS
##                          human.cleanliness  cleanliness.for.animal
## human.cleanliness
##   1 NumQ52                           0.811                   0.358
##   1 NumQ56                           0.713                   0.119
##   1 NumQ57                           0.853                   0.298
##   1 NumQ58                           0.851                   0.292
## cleanliness.for.animal
##   2 NumQ14                           0.340                   0.844
##   2 NumQ35                           0.143                   0.541
```

```
##   2 NumQ36                          0.105                   0.426
##
## ------------------------------------------------------------
## INNER MODEL
## $cleanliness.for.animal
##                      Estimate   Std. Error     t value   Pr(>|t|)
## Intercept           -6.91e-17       0.0928   -7.45e-16   1.000000
## human.cleanliness    3.60e-01       0.0928    3.88e+00   0.000188
##
## ------------------------------------------------------------
## CORRELATIONS BETWEEN LVs
##                          human.cleanliness  cleanliness.for.animal
## human.cleanliness                     1.00                    0.36
## cleanliness.for.animal                0.36                    1.00
##
## ------------------------------------------------------------
## SUMMARY INNER MODEL
##                               Type    R2  Block_Communality
## human.cleanliness         Exogenous  0.00              0.655
## cleanliness.for.animal  Endogenous  0.13              0.396
##                          Mean_Redundancy    AVE
## human.cleanliness                 0.0000  0.655
## cleanliness.for.animal            0.0513  0.396
##
## ------------------------------------------------------------
## GOODNESS-OF-FIT
## [1]  0.2654
##
## ------------------------------------------------------------
## TOTAL EFFECTS
##                                  relationships  direct  indirect  total
## 1  human.cleanliness -> cleanliness.for.animal    0.36         0   0.36
```

cleanliness.for.animal = .36(human.cleanliness)

This is not surprising exactly. However, I wouldn't assume that the person puts forth effort towards the nonhuman animal's sleeping space and body, et cetera. It could still be self-serving, if the person is worried about the dog's or cat's lack of cleanliness will affect themselves and their house and not so much worried for the sake of the animal and their happiness. It's hard for us to be able to measure that hidden intention.

```
plot(model4_pls)
```



This is a pretty strong, positive correlation.

```
# MODEL 5

animal.medical.care            = c(0,0,0,0,0,0,0)
dog.walking                    = c(1,0,0,0,0,0,0)
dog.insurance                  = c(1,1,0,0,0,0,0)
cat.insurance                  = c(1,1,1,0,0,0,0)
income                         = c(1,1,1,1,0,0,0)
animal.tolerance.patience.for  = c(1,1,1,1,1,0,0)
animal.compassion.for          = c(1,1,1,1,1,1,0)

# path matrix (inner model)
```

```
model5 = rbind(animal.medical.care, dog.walking, dog.insurance, cat.insurance,income, animal.tolerance.p
colnames(model5) = rownames(model5)
```

```
foot_blocks = list(c(11,15),8,12,37,59,c(25,26,57),c(42,45,47,52))

foot_modes = c("A","A","A","A","A","A","A")

model5_pls = plspm(final.Data2,model5,foot_blocks,modes=foot_modes)
```

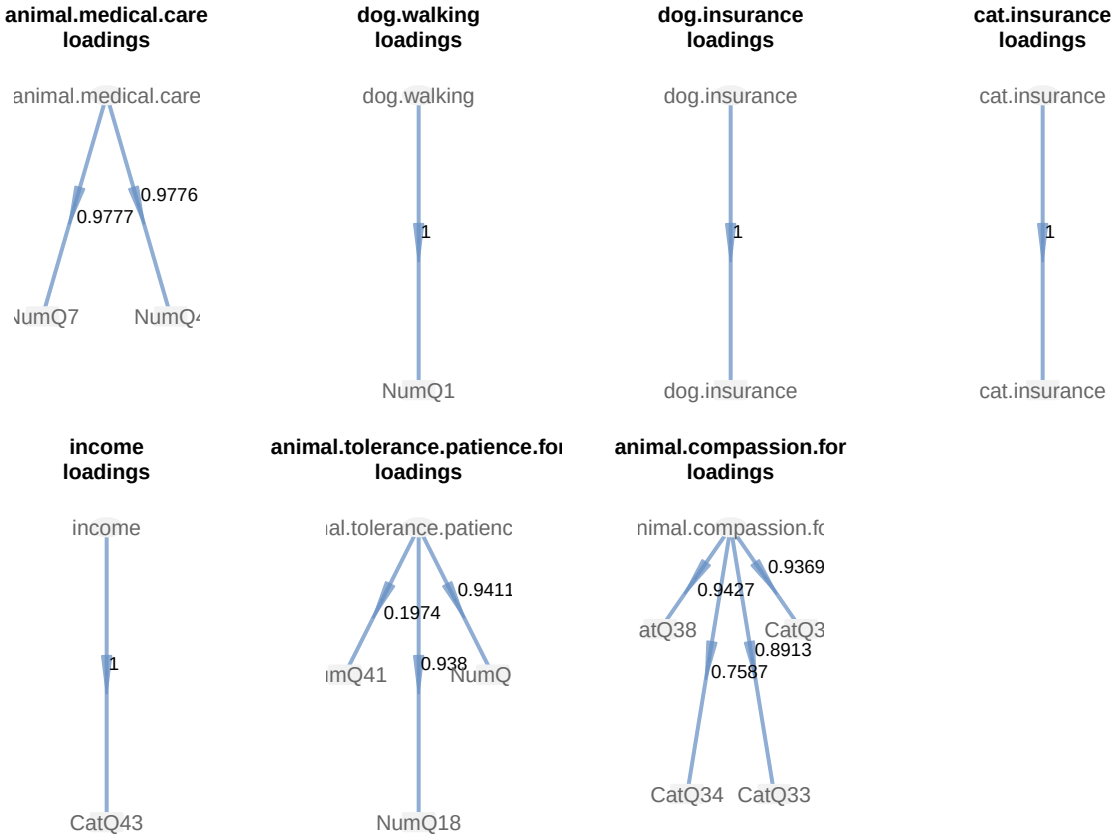
```
summary(model5_pls$unidim)
```

```
##  Mode       MVs            C.alpha           DG.rho          eig.1st
##  A:7   Min.   :1.000   Min.   :0.5745   Min.   :0.7783   Min.   :1.000
##        1st Qu.:1.000   1st Qu.:0.9298   1st Qu.:0.9563   1st Qu.:1.000
```

```
##        Median :1.000   Median :1.0000   Median :1.0000   Median :1.000
##        Mean   :1.857   Mean   :0.9191   Mean   :0.9558   Mean   :1.551
##        3rd Qu.:2.500   3rd Qu.:1.0000   3rd Qu.:1.0000   3rd Qu.:1.859
##        Max.   :4.000   Max.   :1.0000   Max.   :1.0000   Max.   :3.137
##     eig.2nd
##  Min.   :0.0000
##  1st Qu.:0.0000
##  Median :0.0000
##  Mean   :0.2293
##  3rd Qu.:0.3083
##  Max.   :0.9885
```

Satisfactory metrics!

```
plot(model5_pls, what = "loadings", arr.width = 0.1)
```



Num41: The frequency of yelling at the cat when they wanted something is represented less by the LV possibly because 2 of the 3 manifest are about dogs, and we have seen that the behavior between the human and the dog seems to be significantly different than the behavior between the human in the cat, in this study.

It's interesting that the behavior of the response regarding frequency of yelling when the cat wanted something is not too different from the responses regarding yelling at the dog when they wanted something or when they barked (NumQ17 and NumQ18), but yelling when the cat meows is different. Perhaps people are less annoyed by a cat meowing than a dog barking, as a bark tends to be louder and possibly perceived as more aggressive. Just as humans might be more likely to be annoyed by a person who speaks very loudly, than one who speaks more quietly and therefore possibly perceived less aggressively, perhaps.

The animal.compassion is all above .7! It's weird that the negative loadings were for dogs instead of cats like

all the other? Maybe more participants provided answers for cats because they are less ashamed for how they respond to cats than dogs? I am curious as to whether maybe people are more cuddly with cats than dogs, generally.

The frequency of medical treatment the human provides for cats is so different than the frequency of the medical treatment for dogs that a negative loading was again produced.

```
summary(model5_pls)
```

```
## PARTIAL LEAST SQUARES PATH MODELING (PLS-PM)
##
## ------------------------------------------------------------
## MODEL SPECIFICATION
## 1   Number of Cases      103
## 2   Latent Variables     7
## 3   Manifest Variables   13
## 4   Scale of Data        Standardized Data
## 5   Non-Metric PLS       FALSE
## 6   Weighting Scheme     centroid
## 7   Tolerance Crit       1e-06
## 8   Max Num Iters        100
## 9   Convergence Iters    3
## 10  Bootstrapping        FALSE
## 11  Bootstrap samples    NULL
##
## ------------------------------------------------------------
## BLOCKS DEFINITION
##                              Block         Type   Size   Mode
## 1             animal.medical.care    Exogenous      2      A
## 2                     dog.walking   Endogenous      1      A
## 3                  dog.insurance   Endogenous      1      A
## 4                  cat.insurance   Endogenous      1      A
## 5                         income   Endogenous      1      A
## 6   animal.tolerance.patience.for   Endogenous      3      A
## 7           animal.compassion.for   Endogenous      4      A
##
## ------------------------------------------------------------
## BLOCKS UNIDIMENSIONALITY
##                                Mode  MVs  C.alpha  DG.rho  eig.1st
## animal.medical.care               A    2    0.954   0.977     1.91
## dog.walking                       A    1    1.000   1.000     1.00
## dog.insurance                     A    1    1.000   1.000     1.00
## cat.insurance                     A    1    1.000   1.000     1.00
## income                            A    1    1.000   1.000     1.00
## animal.tolerance.patience.for     A    3    0.575   0.778     1.81
## animal.compassion.for             A    4    0.906   0.935     3.14
##                               eig.2nd
## animal.medical.care            0.0882
## dog.walking                    0.0000
## dog.insurance                  0.0000
## cat.insurance                  0.0000
## income                         0.0000
## animal.tolerance.patience.for  0.9885
## animal.compassion.for          0.5284
##
```

```
## ------------------------------------------------------------
## OUTER MODEL
##                                weight  loading  communality  redundancy
## animal.medical.care
##   1 NumQ4                       0.511    0.978        0.956      0.0000
##   1 NumQ7                       0.512    0.978        0.956      0.0000
## dog.walking
##   2 NumQ1                       1.000    1.000        1.000      0.6847
## dog.insurance
##   3 dog.insurance               1.000    1.000        1.000      0.6705
## cat.insurance
##   4 cat.insurance               1.000    1.000        1.000      0.1856
## income
##   5 CatQ43                      1.000    1.000        1.000      0.0587
## animal.tolerance.patience.for
##   6 NumQ17                      0.531    0.941        0.886      0.6880
##   6 NumQ18                      0.507    0.938        0.880      0.6836
##   6 NumQ41                      0.126    0.197        0.039      0.0303
## animal.compassion.for
##   7 CatQ31                      0.297    0.937        0.878      0.6874
##   7 CatQ33                      0.275    0.891        0.794      0.6221
##   7 CatQ34                      0.248    0.759        0.576      0.4509
##   7 CatQ38                      0.306    0.943        0.889      0.6960
##
## ------------------------------------------------------------
## CROSSLOADINGS
##                                animal.medical.care  dog.walking
## animal.medical.care
##   1 NumQ4                                    0.978        0.814
##   1 NumQ7                                    0.978        0.804
## dog.walking
##   2 NumQ1                                    0.827        1.000
## dog.insurance
##   3 dog.insurance                            0.799        0.761
## cat.insurance
##   4 cat.insurance                           -0.321       -0.320
## income
##   5 CatQ43                                  -0.185       -0.100
## animal.tolerance.patience.for
##   6 NumQ17                                   0.794        0.772
##   6 NumQ18                                   0.811        0.793
##   6 NumQ41                                   0.137        0.045
## animal.compassion.for
##   7 CatQ31                                  -0.357       -0.357
##   7 CatQ33                                  -0.394       -0.395
##   7 CatQ34                                  -0.361       -0.352
##   7 CatQ38                                  -0.414       -0.416
##                                dog.insurance  cat.insurance   income
## animal.medical.care
##   1 NumQ4                              0.771         -0.329  -0.1566
##   1 NumQ7                              0.792         -0.298  -0.2049
## dog.walking
##   2 NumQ1                              0.761         -0.320  -0.1001
## dog.insurance
```

```
##   3 dog.insurance                      1.000         -0.118  -0.1183
## cat.insurance
##   4 cat.insurance                     -0.118          1.000   0.1671
## income
##   5 CatQ43                            -0.118          0.167   1.0000
## animal.tolerance.patience.for
##   6 NumQ17                             0.731         -0.282  -0.1305
##   6 NumQ18                             0.713         -0.265  -0.0405
##   6 NumQ41                             0.173         -0.153  -0.0866
## animal.compassion.for
##   7 CatQ31                            -0.280          0.903   0.1827
##   7 CatQ33                            -0.352          0.693   0.0454
##   7 CatQ34                            -0.313          0.524   0.1367
##   7 CatQ38                            -0.343          0.809   0.1600
##                               animal.tolerance.patience.for
## animal.medical.care
##   1 NumQ4                                              0.832
##   1 NumQ7                                              0.831
## dog.walking
##   2 NumQ1                                              0.818
## dog.insurance
##   3 dog.insurance                                      0.772
## cat.insurance
##   4 cat.insurance                                     -0.303
## income
##   5 CatQ43                                            -0.101
## animal.tolerance.patience.for
##   6 NumQ17                                             0.941
##   6 NumQ18                                             0.938
##   6 NumQ41                                             0.197
## animal.compassion.for
##   7 CatQ31                                            -0.337
##   7 CatQ33                                            -0.353
##   7 CatQ34                                            -0.325
##   7 CatQ38                                            -0.345
##                               animal.compassion.for
## animal.medical.care
##   1 NumQ4                                    -0.430
##   1 NumQ7                                    -0.412
## dog.walking
##   2 NumQ1                                    -0.429
## dog.insurance
##   3 dog.insurance                            -0.363
## cat.insurance
##   4 cat.insurance                             0.836
## income
##   5 CatQ43                                    0.150
## animal.tolerance.patience.for
##   6 NumQ17                                   -0.379
##   6 NumQ18                                   -0.324
##   6 NumQ41                                   -0.141
## animal.compassion.for
##   7 CatQ31                                    0.937
##   7 CatQ33                                    0.891
```

```
##   7 CatQ34                                    0.759
##   7 CatQ38                                    0.943
##
## ------------------------------------------------------------
## INNER MODEL
## $dog.walking
##                        Estimate   Std. Error     t value   Pr(>|t|)
## Intercept             -3.98e-16       0.0559   -7.12e-15   1.00e+00
## animal.medical.care    8.27e-01       0.0559    1.48e+01   4.59e-27
##
## $dog.insurance
##                        Estimate   Std. Error     t value   Pr(>|t|)
## Intercept             -2.58e-16       0.0574   -4.50e-15   1.00e+00
## animal.medical.care    5.38e-01       0.1022    5.26e+00   8.05e-07
## dog.walking            3.16e-01       0.1022    3.09e+00   2.61e-03
##
## $cat.insurance
##                        Estimate   Std. Error     t value   Pr(>|t|)
## Intercept              4.10e-16       0.0907    4.52e-15    1.00000
## animal.medical.care   -4.32e-01       0.1826   -2.36e+00    0.02005
## dog.walking           -3.22e-01       0.1691   -1.90e+00    0.05989
## dog.insurance          4.72e-01       0.1580    2.99e+00    0.00357
##
## $income
##                        Estimate   Std. Error     t value   Pr(>|t|)
## Intercept              2.72e-16        0.098    2.78e-15      1.000
## animal.medical.care   -2.86e-01        0.203   -1.41e+00      0.162
## dog.walking            1.99e-01        0.186    1.07e+00      0.287
## dog.insurance         -2.53e-02        0.178   -1.42e-01      0.887
## cat.insurance          1.36e-01        0.109    1.25e+00      0.213
##
## $animal.tolerance.patience.for
##                        Estimate   Std. Error     t value   Pr(>|t|)
## Intercept              9.74e-17       0.0480    2.03e-15   1.00e+00
## animal.medical.care    4.51e-01       0.1002    4.50e+00   1.89e-05
## dog.walking            2.85e-01       0.0915    3.11e+00   2.43e-03
## dog.insurance          1.93e-01       0.0872    2.21e+00   2.92e-02
## cat.insurance         -5.20e-02       0.0536   -9.70e-01   3.34e-01
## income                 4.27e-02       0.0494    8.63e-01   3.90e-01
##
## $animal.compassion.for
##                                 Estimate   Std. Error     t value
## Intercept                      -2.76e-16       0.0475   -5.80e-15
## animal.medical.care             2.97e-02       0.1092    2.72e-01
## dog.walking                    -1.44e-02       0.0951   -1.52e-01
## dog.insurance                  -4.17e-01       0.0886   -4.70e+00
## cat.insurance                   8.50e-01       0.0533    1.59e+01
## income                         -1.95e-02       0.0492   -3.96e-01
## animal.tolerance.patience.for   1.81e-01       0.1006    1.80e+00
##                                 Pr(>|t|)
## Intercept                       1.00e+00
## animal.medical.care             7.86e-01
## dog.walking                     8.80e-01
## dog.insurance                   8.58e-06
```

```
## cat.insurance                   1.03e-28
## income                          6.93e-01
## animal.tolerance.patience.for   7.54e-02
##
## ------------------------------------------------------
## CORRELATIONS BETWEEN LVs
##                                animal.medical.care  dog.walking
## animal.medical.care                          1.000        0.828
## dog.walking                                  0.828        1.000
## dog.insurance                                0.799        0.761
## cat.insurance                               -0.321       -0.320
## income                                      -0.185       -0.100
## animal.tolerance.patience.for                0.850        0.818
## animal.compassion.for                       -0.431       -0.429
##                                dog.insurance  cat.insurance  income
## animal.medical.care                    0.799         -0.321  -0.185
## dog.walking                            0.761         -0.320  -0.100
## dog.insurance                          1.000         -0.118  -0.118
## cat.insurance                         -0.118          1.000   0.167
## income                                -0.118          0.167   1.000
## animal.tolerance.patience.for          0.772         -0.303  -0.101
## animal.compassion.for                 -0.362          0.836   0.150
##                                animal.tolerance.patience.for
## animal.medical.care                                    0.850
## dog.walking                                            0.818
## dog.insurance                                          0.772
## cat.insurance                                         -0.303
## income                                                -0.101
## animal.tolerance.patience.for                          1.000
## animal.compassion.for                                 -0.383
##                                animal.compassion.for
## animal.medical.care                           -0.431
## dog.walking                                   -0.429
## dog.insurance                                 -0.362
## cat.insurance                                  0.836
## income                                         0.150
## animal.tolerance.patience.for                 -0.383
## animal.compassion.for                          1.000
##
## ------------------------------------------------------
## SUMMARY INNER MODEL
##                                      Type      R2  Block_Communality
## animal.medical.care             Exogenous  0.0000              0.956
## dog.walking                    Endogenous  0.6847              1.000
## dog.insurance                  Endogenous  0.6705              1.000
## cat.insurance                  Endogenous  0.1856              1.000
## income                         Endogenous  0.0587              1.000
## animal.tolerance.patience.for  Endogenous  0.7769              0.601
## animal.compassion.for          Endogenous  0.7832              0.784
##                                Mean_Redundancy    AVE
## animal.medical.care                     0.0000  0.956
## dog.walking                             0.6847  1.000
## dog.insurance                           0.6705  1.000
## cat.insurance                           0.1856  1.000
```

```
## income                                    0.0587  1.000
## animal.tolerance.patience.for             0.4673  0.601
## animal.compassion.for                     0.6141  0.784
##
## -----------------------------------------------------------
## GOODNESS-OF-FIT
## [1]  0.6332
##
## -----------------------------------------------------------
## TOTAL EFFECTS
##                                                relationships   direct
## 1                          animal.medical.care -> dog.walking   0.8275
## 2                        animal.medical.care -> dog.insurance   0.5382
## 3                        animal.medical.care -> cat.insurance  -0.4315
## 4                              animal.medical.care -> income  -0.2859
## 5     animal.medical.care -> animal.tolerance.patience.for   0.4510
## 6               animal.medical.care -> animal.compassion.for   0.0297
## 7                               dog.walking -> dog.insurance   0.3157
## 8                               dog.walking -> cat.insurance  -0.3218
## 9                                     dog.walking -> income   0.1993
## 10             dog.walking -> animal.tolerance.patience.for   0.2850
## 11                     dog.walking -> animal.compassion.for  -0.0144
## 12                           dog.insurance -> cat.insurance   0.4718
## 13                                 dog.insurance -> income  -0.0253
## 14           dog.insurance -> animal.tolerance.patience.for   0.1931
## 15                   dog.insurance -> animal.compassion.for  -0.4167
## 16                                 cat.insurance -> income   0.1362
## 17           cat.insurance -> animal.tolerance.patience.for  -0.0520
## 18                   cat.insurance -> animal.compassion.for   0.8501
## 19                  income -> animal.tolerance.patience.for   0.0427
## 20                          income -> animal.compassion.for  -0.0195
## 21  animal.tolerance.patience.for -> animal.compassion.for   0.1808
##     indirect    total
## 1    0.00000   0.8275
## 2    0.26121   0.7994
## 3    0.11087  -0.3206
## 4    0.10101  -0.1849
## 5    0.39902   0.8500
## 6   -0.46035  -0.4307
## 7    0.00000   0.3157
## 8    0.14892  -0.1729
## 9   -0.03154   0.1678
## 10   0.07710   0.3621
## 11  -0.21629  -0.2307
## 12   0.00000   0.4718
## 13   0.06426   0.0389
## 14  -0.02285   0.1703
## 15   0.43108   0.0143
## 16   0.00000   0.1362
## 17   0.00581  -0.0462
## 18  -0.01100   0.8391
## 19   0.00000   0.0427
## 20   0.00771  -0.0118
## 21   0.00000   0.1808
```

dog.walking = .827(animal.medical.care) dog.insurance = .538(animal.medical.care) + .316(dog.walking) cat.insurance = - .432(animal.medical.care) - .322(dog.walking) + .472(dog.insurance) income = -.286(animal.medical.care) + .199(dog.walking) - .0253(dog.insurance) + .136(cat.insurance) animal.tolerance.patience.for = .451(animal.medical.care) + .285(dog.walking) + .193(dog.insurance) - .0520(cat.insurance) + .0427(income) animal.compassion.for = .0297(animal.medical.care) - .0144(dog.walking) -.417(dog.insurance) + .85(cat.insurance) - .0195(income) + .181(animal.tolerance.patience.for)

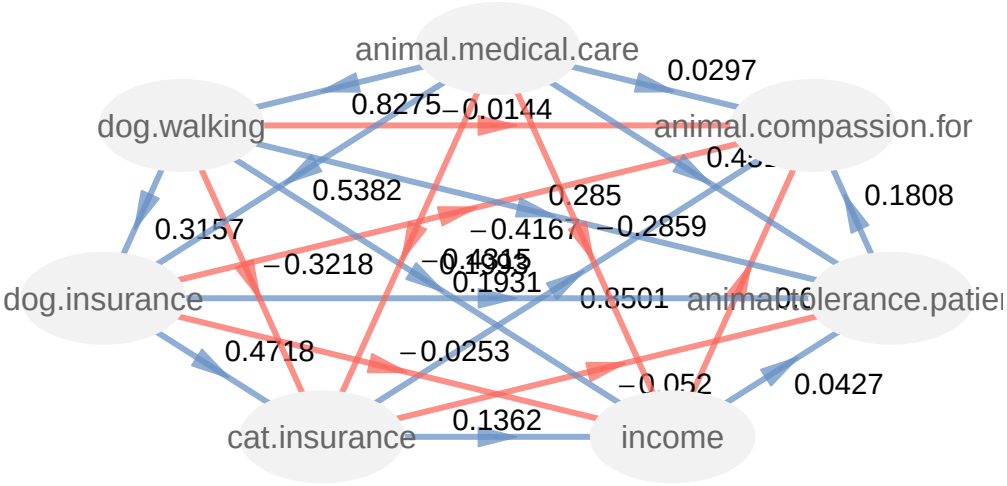
Note the following strong relationships:

animal.medical.care -> dog.walking; .8275 (unsurprising) dog.walking -> dog.insurance; .3157 (uninteresting) dog.walking -> cat.insurance; -.3218 (interesting) dog.insurance -> animal.compassion.for; -.4167 (interesting) cat.insurance -> animal.compassion.for; .8501 (interesting)

It's unclear yet again, why it seems as though the more effort a survey participant put towards the dog, the less they put towards the cat. The more frequently one walked the dog, the less likely they were to provide insurance for the cat. I think our best guess is my analysis from earlier, about domestic cats possibly being more low-risk than dogs, as domestic dogs are probably more likely introduced to the world outside the home more. The last two relationships actually make sense, once you recognize that animal.compassion.for only has manifest variables related to cats, as the dog-versions of the questions produced negative loadings. This same observation explains why there is a negative relationship between dog.walking and animal.compassion.for too.

I'm not sure what to make of there being a negative relationship between dog.insurance and income. I think we could conclude similarly to how I did in model 3: This could be a collective symptom of egocentrism. Maybe a person with higher income would be able to provide a safer, healthier environment for a dog and therefore does not provide much medical care for the dog (in this case, specifically insurance) - perhaps a less pessimistic view. I don't have any possible explanations to provide for why one's effort towards being tolerant and patient towards the dog and/or cat would be negatively correlated with whether or not they have insurance for the cat or not. I find it very significant that the higher one's income is, the less effort they put towards being compassionate towards the dog. This is very likely to be a symptom of egocentrism.

```
plot(model5_pls)
```




```
# MODEL 6

animal.appearance.comfort            = c(0,0,0,0,0,0)
animal.hygiene                       = c(1,0,0,0,0,0)
income                               = c(1,1,0,0,0,0)
dog.walking.freq                     = c(1,1,1,0,0,0)
animal.tolerance.patience.for        = c(1,1,1,1,0,0)
animal.compassion.for                = c(1,1,1,1,1,0)

# path matrix (inner model)

model6 = rbind(animal.appearance.comfort,animal.hygiene,income,dog.walking.freq,animal.tolerance.patien
colnames(model6) = rownames(model6)
```

```
foot_blocks = list(c(9,17,19,24),41,59,8,c(25,26,57),c(42,45,47,52))

foot_modes = c("A","A","A","A","A","A")

model6_pls = plspm(final.Data2,model6,foot_blocks,modes=foot_modes)
```

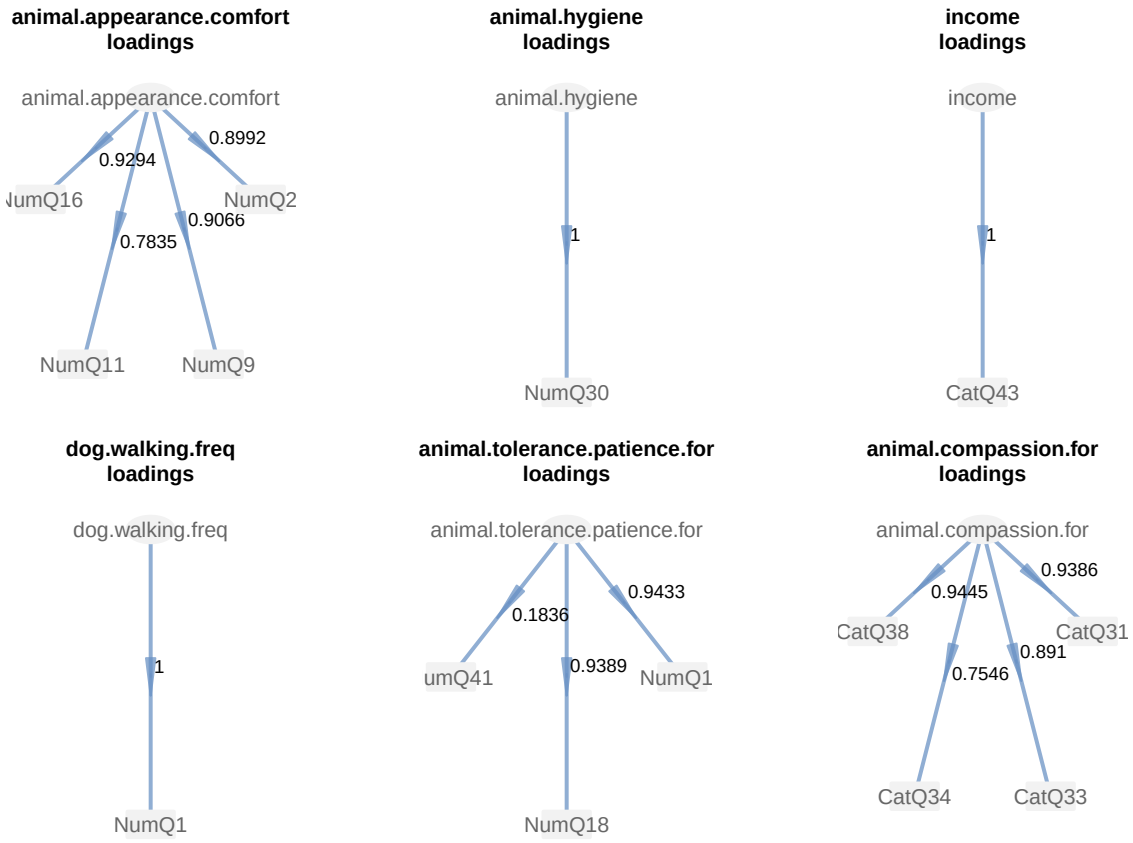
```
summary(model6_pls$unidim)
```

```
##  Mode       MVs           C.alpha          DG.rho          eig.1st
##  A:6   Min.   :1.000   Min.   :0.5745   Min.   :0.7783   Min.   :1.000
##        1st Qu.:1.000   1st Qu.:0.9047   1st Qu.:0.9340   1st Qu.:1.000
##        Median :2.000   Median :0.9528   Median :0.9676   Median :1.403
##        Mean   :2.333   Mean   :0.8974   Mean   :0.9412   Mean   :1.843
```

```
##        3rd Qu.:3.750   3rd Qu.:1.0000   3rd Qu.:1.0000   3rd Qu.:2.788
##        Max.   :4.000   Max.   :1.0000   Max.   :1.0000   Max.   :3.137
##     eig.2nd
##  Min.   :0.0000
##  1st Qu.:0.0000
##  Median :0.2415
##  Mean   :0.3333
##  3rd Qu.:0.5170
##  Max.   :0.9885
```

All of these metrics are satisfied!

```
plot(model6_pls, what = "loadings", arr.width = 0.1)
```



Animal.appearance.comfort: All of these variables are relevant to the human's behavior with the dog. How often they dressed up a cat in costume had a negative loading, probably because all the other variables were dog-related. This is due to myself not including a question about clipping cat's claws on the survey (not really sure why I did not), as well as how often they let the cat sleep with them and cuddle with them, if they did - having to be left out of my data analysis overall. This speaks, again, to their being some kind of significant claim about how humans see cuddling with cats. Maybe its because cats are generally smaller and consequently seeming "cuter" and easier to cuddle with than a large dog for instance. Our conclusion about NumQ41 is the same as in the previous model.

```
summary(model6_pls)
```

```
## PARTIAL LEAST SQUARES PATH MODELING (PLS-PM)
##
## ------------------------------------------------------------
## MODEL SPECIFICATION
```

```
## 1   Number of Cases      103
## 2   Latent Variables     6
## 3   Manifest Variables   14
## 4   Scale of Data        Standardized Data
## 5   Non-Metric PLS       FALSE
## 6   Weighting Scheme     centroid
## 7   Tolerance Crit       1e-06
## 8   Max Num Iters        100
## 9   Convergence Iters    3
## 10  Bootstrapping        FALSE
## 11  Bootstrap samples    NULL
##
## ------------------------------------------------------------
## BLOCKS DEFINITION
##                              Block         Type   Size   Mode
## 1       animal.appearance.comfort    Exogenous      4      A
## 2                  animal.hygiene   Endogenous      1      A
## 3                         income   Endogenous      1      A
## 4                dog.walking.freq   Endogenous      1      A
## 5   animal.tolerance.patience.for   Endogenous      3      A
## 6           animal.compassion.for   Endogenous      4      A
##
## ------------------------------------------------------------
## BLOCKS UNIDIMENSIONALITY
##                                Mode  MVs  C.alpha  DG.rho  eig.1st
## animal.appearance.comfort         A    4    0.904   0.934     3.12
## animal.hygiene                    A    1    1.000   1.000     1.00
## income                            A    1    1.000   1.000     1.00
## dog.walking.freq                  A    1    1.000   1.000     1.00
## animal.tolerance.patience.for     A    3    0.575   0.778     1.81
## animal.compassion.for             A    4    0.906   0.935     3.14
##                               eig.2nd
## animal.appearance.comfort       0.483
## animal.hygiene                  0.000
## income                          0.000
## dog.walking.freq                0.000
## animal.tolerance.patience.for   0.988
## animal.compassion.for           0.528
##
## ------------------------------------------------------------
## OUTER MODEL
##                                weight  loading  communality  redundancy
## animal.appearance.comfort
##   1 NumQ2                       0.337    0.899       0.8085      0.0000
##   1 NumQ9                       0.297    0.907       0.8220      0.0000
##   1 NumQ11                      0.208    0.783       0.6138      0.0000
##   1 NumQ16                      0.285    0.929       0.8638      0.0000
## animal.hygiene
##   2 NumQ30                      1.000    1.000       1.0000      0.1000
## income
##   3 CatQ43                      1.000    1.000       1.0000      0.0259
## dog.walking.freq
##   4 NumQ1                       1.000    1.000       1.0000      0.7123
## animal.tolerance.patience.for
```

```
##   5 NumQ17                       0.535    0.943       0.8897      0.6620
##   5 NumQ18                       0.506    0.939       0.8816      0.6560
##   5 NumQ41                       0.113    0.184       0.0337      0.0251
## animal.compassion.for
##   6 CatQ31                       0.301    0.939       0.8810      0.6549
##   6 CatQ33                       0.273    0.891       0.7939      0.5901
##   6 CatQ34                       0.240    0.755       0.5694      0.4232
##   6 CatQ38                       0.311    0.944       0.8921      0.6631
##
## ------------------------------------------------------------
## CROSSLOADINGS
##                               animal.appearance.comfort  animal.hygiene
## animal.appearance.comfort
##   1 NumQ2                                         0.899         -0.3526
##   1 NumQ9                                         0.907         -0.3160
##   1 NumQ11                                        0.783         -0.2046
##   1 NumQ16                                        0.929         -0.2140
## animal.hygiene
##   2 NumQ30                                       -0.316          1.0000
## income
##   3 CatQ43                                       -0.133          0.1283
## dog.walking.freq
##   4 NumQ1                                         0.838         -0.3601
## animal.tolerance.patience.for
##   5 NumQ17                                        0.776         -0.2925
##   5 NumQ18                                        0.795         -0.2671
##   5 NumQ41                                        0.152         -0.0693
## animal.compassion.for
##   6 CatQ31                                       -0.327          0.8806
##   6 CatQ33                                       -0.372          0.7236
##   6 CatQ34                                       -0.345          0.5040
##   6 CatQ38                                       -0.378          0.8567
##                                income  dog.walking.freq
## animal.appearance.comfort
##   1 NumQ2                     -0.1719            0.785
##   1 NumQ9                     -0.0867            0.754
##   1 NumQ11                    -0.0872            0.563
##   1 NumQ16                    -0.1086            0.814
## animal.hygiene
##   2 NumQ30                     0.1283           -0.360
## income
##   3 CatQ43                     1.0000           -0.100
## dog.walking.freq
##   4 NumQ1                     -0.1001            1.000
## animal.tolerance.patience.for
##   5 NumQ17                    -0.1305            0.772
##   5 NumQ18                    -0.0405            0.793
##   5 NumQ41                    -0.0866            0.045
## animal.compassion.for
##   6 CatQ31                     0.1827           -0.357
##   6 CatQ33                     0.0454           -0.395
##   6 CatQ34                     0.1367           -0.352
##   6 CatQ38                     0.1600           -0.416
##                               animal.tolerance.patience.for
```

```
## animal.appearance.comfort
##   1 NumQ2                                            0.832
##   1 NumQ9                                            0.740
##   1 NumQ11                                           0.551
##   1 NumQ16                                           0.768
## animal.hygiene
##   2 NumQ30                                          -0.299
## income
##   3 CatQ43                                          -0.100
## dog.walking.freq
##   4 NumQ1                                            0.819
## animal.tolerance.patience.for
##   5 NumQ17                                           0.943
##   5 NumQ18                                           0.939
##   5 NumQ41                                           0.184
## animal.compassion.for
##   6 CatQ31                                          -0.335
##   6 CatQ33                                          -0.353
##   6 CatQ34                                          -0.325
##   6 CatQ38                                          -0.344
##                                 animal.compassion.for
## animal.appearance.comfort
##   1 NumQ2                                      -0.465
##   1 NumQ9                                      -0.396
##   1 NumQ11                                     -0.203
##   1 NumQ16                                     -0.293
## animal.hygiene
##   2 NumQ30                                      0.849
## income
##   3 CatQ43                                      0.150
## dog.walking.freq
##   4 NumQ1                                      -0.429
## animal.tolerance.patience.for
##   5 NumQ17                                     -0.378
##   5 NumQ18                                     -0.324
##   5 NumQ41                                     -0.141
## animal.compassion.for
##   6 CatQ31                                      0.939
##   6 CatQ33                                      0.891
##   6 CatQ34                                      0.755
##   6 CatQ38                                      0.944
##
## ------------------------------------------------------------
## INNER MODEL
## $animal.hygiene
##                              Estimate   Std. Error     t value   Pr(>|t|)
## Intercept                   -4.03e-17       0.0944   -4.27e-16    1.00000
## animal.appearance.comfort   -3.16e-01       0.0944   -3.35e+00    0.00114
##
## $income
##                              Estimate   Std. Error     t value   Pr(>|t|)
## Intercept                    2.02e-16       0.0987    2.05e-15      1.000
## animal.appearance.comfort   -1.02e-01       0.1040   -9.85e-01      0.327
## animal.hygiene               9.59e-02       0.1040    9.22e-01      0.359
```

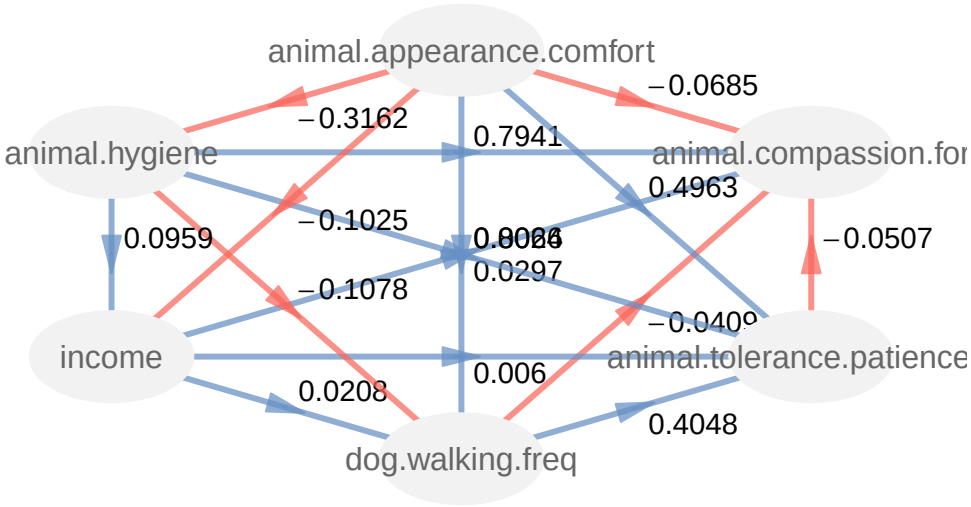
```
##
## $dog.walking.freq
##                              Estimate   Std. Error     t value   Pr(>|t|)
## Intercept                   -1.71e-16       0.0539   -3.17e-15   1.00e+00
## animal.appearance.comfort    8.06e-01       0.0571    1.41e+01   1.83e-25
## animal.hygiene              -1.08e-01       0.0571   -1.89e+00   6.18e-02
## income                       2.08e-02       0.0546    3.81e-01   7.04e-01
##
## $animal.tolerance.patience.for
##                              Estimate   Std. Error     t value   Pr(>|t|)
## Intercept                   -7.58e-17       0.0511   -1.48e-15   1.00e+00
## animal.appearance.comfort    4.96e-01       0.0940    5.28e+00   7.77e-07
## animal.hygiene               2.62e-03       0.0551    4.76e-02   9.62e-01
## income                       6.03e-03       0.0518    1.16e-01   9.08e-01
## dog.walking.freq             4.05e-01       0.0953    4.25e+00   4.90e-05
##
## $animal.compassion.for
##                                Estimate   Std. Error     t value
## Intercept                     -5.15e-18       0.0514   -1.00e-16
## animal.appearance.comfort     -6.85e-02       0.1072   -6.39e-01
## animal.hygiene                 7.94e-01       0.0554    1.43e+01
## income                         2.97e-02       0.0522    5.70e-01
## dog.walking.freq              -4.09e-02       0.1044   -3.92e-01
## animal.tolerance.patience.for -5.07e-02       0.1017   -4.98e-01
##                               Pr(>|t|)
## Intercept                     1.00e+00
## animal.appearance.comfort     5.24e-01
## animal.hygiene                1.13e-25
## income                        5.70e-01
## dog.walking.freq              6.96e-01
## animal.tolerance.patience.for 6.20e-01
##
## ------------------------------------------------------------
## CORRELATIONS BETWEEN LVs
##                               animal.appearance.comfort  animal.hygiene
## animal.appearance.comfort                         1.000          -0.316
## animal.hygiene                                   -0.316           1.000
## income                                           -0.133           0.128
## dog.walking.freq                                  0.838          -0.360
## animal.tolerance.patience.for                     0.834          -0.299
## animal.compassion.for                            -0.400           0.850
##                               income  dog.walking.freq
## animal.appearance.comfort     -0.133             0.838
## animal.hygiene                 0.128            -0.360
## income                         1.000            -0.100
## dog.walking.freq              -0.100             1.000
## animal.tolerance.patience.for -0.100             0.819
## animal.compassion.for          0.150            -0.429
##                               animal.tolerance.patience.for
## animal.appearance.comfort                             0.834
## animal.hygiene                                       -0.299
## income                                               -0.100
## dog.walking.freq                                      0.819
## animal.tolerance.patience.for                         1.000
```

```
## animal.compassion.for                                -0.382
##                                animal.compassion.for
## animal.appearance.comfort                     -0.400
## animal.hygiene                                 0.850
## income                                         0.150
## dog.walking.freq                              -0.429
## animal.tolerance.patience.for                 -0.382
## animal.compassion.for                          1.000
##
## ------------------------------------------------------------
## SUMMARY INNER MODEL
##                                      Type      R2  Block_Communality
## animal.appearance.comfort       Exogenous  0.0000              0.777
## animal.hygiene                 Endogenous  0.1000              1.000
## income                         Endogenous  0.0259              1.000
## dog.walking.freq               Endogenous  0.7123              1.000
## animal.tolerance.patience.for  Endogenous  0.7440              0.602
## animal.compassion.for          Endogenous  0.7433              0.784
##                                Mean_Redundancy    AVE
## animal.appearance.comfort               0.0000  0.777
## animal.hygiene                          0.1000  1.000
## income                                  0.0259  1.000
## dog.walking.freq                        0.7123  1.000
## animal.tolerance.patience.for           0.4477  0.602
## animal.compassion.for                   0.5828  0.784
##
## ------------------------------------------------------------
## GOODNESS-OF-FIT
## [1]  0.5834
##
## ------------------------------------------------------------
## TOTAL EFFECTS
##                                                    relationships    direct
## 1                  animal.appearance.comfort -> animal.hygiene  -0.31621
## 2                          animal.appearance.comfort -> income  -0.10246
## 3                animal.appearance.comfort -> dog.walking.freq   0.80643
## 4   animal.appearance.comfort -> animal.tolerance.patience.for   0.49630
## 5           animal.appearance.comfort -> animal.compassion.for  -0.06852
## 6                                    animal.hygiene -> income   0.09590
## 7                           animal.hygiene -> dog.walking.freq  -0.10781
## 8              animal.hygiene -> animal.tolerance.patience.for   0.00262
## 9                      animal.hygiene -> animal.compassion.for   0.79407
## 10                                  income -> dog.walking.freq   0.02081
## 11                     income -> animal.tolerance.patience.for   0.00603
## 12                             income -> animal.compassion.for   0.02973
## 13           dog.walking.freq -> animal.tolerance.patience.for   0.40484
## 14                   dog.walking.freq -> animal.compassion.for  -0.04092
## 15      animal.tolerance.patience.for -> animal.compassion.for  -0.05065
##     indirect    total
## 1    0.00000  -0.3162
## 2   -0.03032  -0.1328
## 3    0.03133   0.8378
## 4    0.33753   0.8338
## 5   -0.33156  -0.4001
```

```
## 6    0.00000   0.0959
## 7    0.00200  -0.1058
## 8   -0.04226  -0.0396
## 9    0.00919   0.8033
## 10   0.00000   0.0208
## 11   0.00842   0.0145
## 12  -0.00158   0.0281
## 13   0.00000   0.4048
## 14  -0.02051  -0.0614
## 15   0.00000  -0.0507
```

animal.hygiene = -.316(animal.appearance.comfort) income = -.102(animal.appearance.comfort) + .0959(animal.hygiene) dog.walking.freq = .806(animal.appearance.comfort) - .108(animal.hygiene) + .0208(income) animal.tolerance.patience.for = .496(animal.appearance.comfort) + .00262(animal.hygiene) + .00603(income) + .405(dog.walking.freq) animal.compassion.for = - .0685(animal.appearance.comfort) + .794(animal.hygiene) + .0297(income) - .0409(dog.walking.freq) - .0507(animal.tolerance.patience.for)

```
plot(model6_pls)
```



The Survey and Its Ecocentrism Scale

Survey with the eco scales for most of the dog/cat questions, magnitude of frequency for human questions, binary scale for binary factor/categorical variables, as well as the respective reference number in the r code for each question. The questions that had to be left out of the data analysis, due to not being able to be part of any latent variable because of a low Chronbach's Alpha (inconsistent with all other survey questions):

What does living with a cat or dog mean to you?

You are being invited to participate in a research study about your domestic interactions with dogs and cats. If you are younger than 18, do not proceed. This study is being conducted by Megan Elizabeth Goetz and Dr. Jebessa Mijena at Georgia College. You can contact Megan Elizabeth Goetz at megan.goetz@bobcats.gcsu.edu or 706-564-6205. OPTIONAL: You were selected as a possible participant in this study because you are part of the Georgia College community and have lived with one or more cats and/or dogs, while also being the person taking care of them. The questionnaire(s) will take about 10-15 minutes to complete.

This survey is anonymous. Do not indicate your name on the survey. We will not collect IP addresses either. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study. You can, however, contact Megan if you want to see the data analysis.

The expected benefits of this study include a better understanding of people's perspectives of other animals that we can expose and discuss, in order to better our harmonious relationships with all of Earth's inhabitants.

You are not likely to experience physical, psychological, social, or legal risks beyond those ordinarily encountered in daily life or during the performance of routine examinations or tests by participating in this study.

Your participation in this study is voluntary. By completing and submitting the survey you are voluntarily agreeing to participate and you are acknowledging that you are 18 years of age or older. You are free to stop answering questions at any time or to decline to answer any particular question you do not wish to answer for any reason. Research at Georgia College involving human participants is carried out under the oversight of the Institutional Review Board. Address questions or problems regarding these activities to Dr. Whitney Heppner, GC IRB Chair, CBX 090, GC, email: irb@gcsu.edu; phone: (478) 445-0870.

- Required

How are you part of the Georgia College community? 1. * Check all that apply.

current student
alumnus/alumna
faculty
staff
involved in one or more GC clubs, organizations, sororities/fraternities, societies, or other GC groups
attend and/or participate in GC campus events or GC community events

Instructions

Choose the option that is most applicable to your past or current experiences.

Answer Part 1 if you have lived or do live with one or more dogs and were/are the person taking care of them. All of your answers need to be based on the same relationship you had/have with only one of these particular dogs.

Answer Part 2 if you have lived or do live with one or more cats and were/are the person taking care of them. All of your answers need to be based on the same relationship you had/have with only one of these particular cats.

Answer Part 3 regardless of if you answered Part 1, Part 2, or both. Respond to Part 3 based on your activity during the time you took/take care of the animal in part 1 or part 2.

If you answered both Part 1 and Part 2, choose only one of these time periods that you took/take care of either the dog or the cat.

Part 1 Answer if you have lived with one or more dogs or currently do and were/are the person taking care of them. All of your answers need to be based on the same relationship you had/have with only one of these particular dogs.
Skip to Part 2 if you have only lived with one or more cats or currently do and were/are the person taking care of them.

"NumQ1" 2. On average, how often did you walk the dog outside? (8 in r)
Once a day - 4
Once a week - 3 Once a month - 2
Every now and then (less frequent than once a month) - 1

"NumQ2" 3. Approximately how often did you dress them up for holidays, such as Halloween, Christmas, et cetera? (9 in r)
Always (whenever I got a chance) - 1
Often (5 or more times a year) - 2
Sometimes (less than 5 times a year) - 3
Never - 4

"NumQ3" 4. Approximately how often did you buy them the same dog food? (10 in r)
Always the same kind - 4
Usually the same 1-2 kind(s) - 3
Usually a different kind [alternate among 4-5 kinds] - 2
Always a different kind [always trying something new] - 1

"NumQ4" 5. How often did they see a vet? (11 in r)
Once or more a year - 4
Once every couple/few years - 3
Less than once every three years - 2
Once/twice ever - 1

"dog.insurance" 6. Did you have insurance for them? (binary factor variable) (12 in r)
Yes - 1
No - 0

```
*Note Vet 1 wrote "depends on dog health + owner's preference" and Vet 2 wrote
"depends on health of dog + affordability"*
```

"NumQ6" 7. How often did/do you take them to get their rabies shot? (14 in r)
left out of data analysis, because inconsistent with other answers - via Chronbach's Alpha measure
As frequently as or close to as recommended - 4
Sometimes as recommended [off-and-on] -3
Once or twice ever - 2
Never - 1

"NumQ7" 8. Do you get them medicine/treatments that the vet suggests? (15 in r)
Always or Almost Always - 4
Sometimes - 3
Rarely - 2
Never - 1

"NumQ8" 9. On average, how often were they bathed? (16 in r)
Once a week - 2
Once a month - 4
Once every few months - 3
Less than or equal to 3 times a year - 1

```
*Note only vet 1 gave this scale and wrote "depends on the animal's skin";
Vet 2 noted "bathing too often can cause skin irritation unless on a medicated shampoo"
without giving a scale.*
```

“NumQ9” 10. Did you clip their nails/have their nails clipped? (17 in r)
Often - 3
Sometimes - 4
Rarely - 2
Never - 1

```
*Note this is only Vet 2's scale and they wrote "walking can wear the nails down";
Vet 1 had the 3 and 4 switched and wrote "depends on animal." I agreed with Vet 2's scale,
so I went with her's.
```

“CatQ10” 11. Did you let them sleep with you? (18 in r)
Yes - 2
No because they didn’t want/try to sleep with me - 2
No because I didn’t want them to - 1
No because I have allergies - 2

```
*Note that Dr. Causey scaled it 4, 3, 1, 2, but I believe letting them sleep with
you is just as justified as not sleeping with them because they didn't want to or try to
or because one has allergies.*
```

“NumQ11” 12. If yes, how often did you let them sleep with you? (19 in r)
Always - 4
Usually - 3
Sometimes - 2
Rarely - 1

“CatQ12” 13. If no and they didn’t want to sleep with you, where did they sleep? (20 in r)
Dog bed - 3
On the couch or other furniture inside - 3
Crate/cage - 3 Kennel - 2
Outside - 1

```
*Note Vet 1 scaled this 5, 4, 3, 2, 1 and Vet 2 scaled this 4, 4, 4, 4, 1
(which means she misunderstood how to scale this). I recongize though that some
dogs prefer furniture to beds made for dogs and some dogs have comfy, spacious
crates/cages with comfy beds in them. This is why the first 3 were made to have the same
level of ecocentrism.*
```

“CatQ13” 14. If no and they did want to sleep with you, where did they sleep? (21 in r)
Dog bed - 3
On the couch or other furniture inside - 3
Crate/cage - 3
Kennel - 2
Outside - 1

```
*Note Vet 1 scaled this 5, 4, 3, 2, 1 and Vet 2 scaled this 4, 4, 4, 4, 1
(which means she misunderstood how to scale this). I recongize though that
some dogs prefer furniture to beds made for dogs and some dogs have comfy,
spacious crates/cages with comfy beds in them. This is why the first 3 were
made to have the same level of ecocentrism.*
```

“NumQ14” 15. If they had a designated sleeping spot that wasn’t with you, such as kennel/cage/crate/dog bed/et cetera, how frequent were your upkeep efforts [washing/cleaning the bed/area]? (22 in r)
Once or more a week - 4
Once or more a month, but not weekly - 3
Once or more every few months, but not monthly - 2
Never - 1

“CatQ15” 16 Did you let them cuddle with you at all? (23 in r)

Yes - 2
No, they didn't want to/try to cuddle - 2
No, because I have allergies - 2
No, because I didn't want them to cuddle with me - 1

```
*Note that Dr. Causey scaled it 4, 3, 2, 1, but I believe letting them
cuddle with you is just as justified as not cuddling with them because
they didn't want to or try to or because one has allergies.*
```

"NumQ16" 17. If yes, how often did you let them cuddle with you? (24 in r)
Always - 4
Usually - 3
Sometimes - 2
Rarely - 1

"NumQ17" 18. Did you yell at them when they barked? (25 in r)
Always or A lot of the time - 1
Sometimes - 2
Rarely - 3
Never - 4

"NumQ18" 19. Did you yell at them when they wanted something? (26 in r)
Always or A lot of the time - 1
Sometimes - 2
Rarely - 3
Never - 4

"CatQ19" 20. Why did/do you live with the dog? (27 in r)
I had/have always wanted to live with a dog - 3
I love living with dogs - 4
I think they are cute, amusing, et cetera. - 2
I want[ed] someone to cuddle with/help me relax - 1
They need help with their health - 5
They need a home - 5
I feel like we like each other - 5
Other: (They can write in an answer here)

```
*Note Dr. Causey scaled this 3, 4, 2, 1, 6, 7, 5. But,
I believe "They need a home" can be just as ecocentric as
"They need help with their health" or "I feel like we like each other,"
as ecocentrism promotes mutually benefecial, helpful, constructive relationships
with other beings.

Also note the scaling I associated with write-in answers:
" couldn't decide between several answers. I love animals and always
take very good care of them, as they are family" - 5 because referring
to them as family and taking good care of them references mutually beneficial
relationships and the subject avoids using "I" and egotistical pronouns/statements.
"Living with a dog helps me manage my depression, anxiety, and helps stabilize
my mood. My dog is my emotional support animal" - 1, because this person is
identifying the animal as useful to them.
"all of the above" - 5
"I was fostering her but then fell in love and decided to keep her" - 5;
fostering tends to have ecocentric intentions and subject avoids egotistical
pronouns and statements.
"Pups are great. I did not seek him. He came to me. I was leaving
a newly  established living space near a 8 lane highway. He followed my
```

```
car until I said it was to close. I opened my door, and he hopped in to my arms.
I held him like a 50 bound baby, and I knew it was just right." - 5 because
"He came to me...and I knew it was just right"
"I had a dog that passed away and when I saw her at the Baldwin County
shelter I knew she was special and needed a home" - 5 because "needed a home"
```

Part 2 Answer if you have lived with one or more cats or currently do and were/are the person taking care of them. All of your answers need to be based on the same relationship you had/have with only one of these particular cats. Skip if you have only ever lived with one or more dogs and not any cats. If this is the case, now skip to Part 3.

"CatQ20" 21. Did they have a kitty door, allowing them to go in and out of the house? (28 in r) *left out of data analysis*
Yes
No

```
*Note: V2 personally has no itty door and lets the cat in and out*
```

"NumQ21" 22. If not, did they have a safety/health issue where they depended on your help and/or need to stay inside? (29 in r) *left out of data analysis*
Yes - 1
No - 0

"CatQ22" 23. If they did not have a kitty door that allowed them to go outside, was there another way they were able to go outside? *left out of data analysis* (30 in r)
I walked them with a leash - 2
I let them in and out throughout the day - 3
I did not let them go outside; they had no medical/dependency issue outside - 1
I did not let them go outside; they had a medical/dependency issue - 3
They did not want to go outside - 3

"NumQ23" 24. If they went outside by means of walking with a leash, how often was it? (31 in r)
Once a day - 4
Once a week - 3
Once a month - 2
Every now and then [less than monthly] - 1

```
*Note Vet 2 wrote "no leash walks" without a scale. I believe she
was referencing her own behavior with the cat she lives with, as they told me they
wrote what they do in response to some of the questions.*
```

"NumQ24" 25. If they went outside by means of you manually putting them outside [such as opening the door for them], approximately how often was it? (32 in r)
I let them in and out throughout the day [more than three times a day] or when they wanted - 4
I let them out three times a day - 3
I let them out twice a day - 2
I let them out once a day - 1

```
*Note Vet 2 just wrote "depends on how long person is home/how often cat wants out"*
```

"NumQ25" 26 Approximately how often did you dress them up for holidays, such as Halloween, Christmas, et cetera? (33 in r)
Always (whenever I got a chance) - 1
Often (5 or more times a year) - 2
Sometimes (less than 5 times a year) - 3
Never - 4

"NumQ26" 27. Approximately how often did you buy them the same cat food? (34 in r)
Always the same kind - 4
Usually the same 1-2 kind(s) - 3
Usually a different kind [alternate among 4-5 kinds] - 2
Always a different kind [always trying something new] - 1

"NumQ27" 28. Approximately, how often did they see a vet? (36 in r) *left out of data analysis*
Once or more a year - 4
Once every couple/few years - 3
Less than every 3 years - 2
Never - 1

"cat.insurance" 29. Did you have insurance for them? (37 in r)
yes - 1
no - 0

"NumQ29" 30. Do you get them medicine/treatments that the vet suggests? (39 in r)
Always or A lot of the time - 4
Sometimes - 3
Rarely - 2
Never - 1

"NumQ30" 31. How often did you bathe them/have them bathed? (41 in r)
Once a week - 1
Once a month - 2
Once every couple/few months - 3
Less than or equal to 3 times a year - 4

```
*Note Vet 2 wrote 'very stressful'"*
```

"CatQ31" 32 Did you let them sleep with you? (42 in r)
Yes - 2
No, because they didn't want/try to sleep with me - 2
No, because I didn't want them to - 1
No, because I have allergies - 2

```
*Note that Dr. Causey scaled it 4, 3, 1, 2, but I believe letting them sleep with you
is just as justified as not sleeping with them because they didn't want to or try to or
because one has   allergies.*
```

"NumQ32" 33. If yes, how often did you let them sleep with you? (44 in r) *left out of data analysis*
Always - 4
Usually - 3
Sometimes - 2
Rarely - 1

"CatQ33" 34. If they didn't want to sleep with you, where did they sleep? (45 in r)
Cat bed - 3
A couch or some other furniture inside - 3
Crate/cage - 3
Kennel - 2
Outside - 1

```
*Note: I recongize though that some catss prefer furniture to beds
made for cats and some cats have comfy, spacious crates/cages with comfy beds in them.
This is why the first 3 were made to have the same level of ecocentrism. Vet 2 wrote
"no cage/kennel, and Vet 1 wrote "wherever they want to sleep" - an ecocentric answer!*
```

"CatQ34" 35. If they did want to sleep with you, where did they sleep? (47 in r)

Cat bed - 3
A couch or some other furniture inside - 3
Crate/cage - 3
Kennel - 2
Outside - 1

```
*Note: I recongize though that some catss prefer furniture to beds made for cats
and some cats have comfy, spacious crates/cages with comfy beds in them. This is
why the first 3 were made to have the same level of ecocentrism. Again, Vet 1 wrote
"wherever they want to sleep," but Vet 2 wrote sleep w/ me most nights".
So it is clear they were thinking   about their personal experience here.*
```

"NumQ35" 36. If they had a designated sleeping spot that wasn't with you, such as kennel/cage/crate/cat bed/et cetera, how frequent were your upkeep efforts [washing/cleaning the bed/area]? (49 in r)
Once or more a week - 4
Once or more a month, but not weekly - 3
Once or more every few months, but not monthly - 2
Never - 1

"NumQ36" 37 If they weren't a completely-outside cat, how often did you maintain the upkeep of the litterbox? (50 in r)
Daily - 4
Weekly - 3
Monthly - 2
Less than once a month - 1

"CatQ37" 38. If they were a completely-outside cat, why? (50 in r) *left out of data analysis*
They never wanted to come inside - 2
We didn't want them inside - 1

"CatQ38" 39. Did you let them cuddle with you at all? (52 in r)
Yes - 2
No, they didn't want to/try to cuddle - 2
No, because I have allergies - 2
No, because I didn't want them to cuddle with me - 1

```
*Note that Dr. Causey scaled it 4, 3, 2, 1, but I believe letting them cuddle
with you is just as justified as not cuddling with them because they didn't
want to or try to or because one has allergies.*
```

"NumQ39" 40. If yes, how often did you let them cuddle with you? (54 in r) *left out of data analysis*
Always - 4
Usually - 3
Sometimes - 2
Rarely - 1

"NumQ40" 41. Did you yell at them when they meowed? (55 in r)
Always or A lot of the time - 1
Sometimes - 2
Rarely - 3
Never - 4

"NumQ41" 42. Did you yell at them when they wanted something? (57 in r)
Always or A lot of the time - 1
Sometimes - 2
Rarely - 3
Never - 4

"CatQ42" 43 Why did/do you live with the cat? (58 in r)
I had/have always wanted to live with a cat - 3
I love living with cats - 4
I think they are cute, amusing, et cetera. - 2
I want[ed] someone to cuddle with/help me relax - 1
They need help with their health - 5
They need a home - 5
I feel like we like each other - 5
Other: (They could write-in an answer here)

```
*Also note the scaling I associated with write-in answers:
"all of the above" - 5
"The cat came with my spouse" - N/A; we could not scale this because
this response does not provide any insight into their attentions, as
living with the cat was not up to them.
"I always wanted a dog and cat that played together (they do :))" - 2
because this is similar to the response about amusement.
"Couldn't decide between several answers I Love animals and always
taken very good care of them as they are family" - 5
"Dumpster kitty wanted love." - 5, because they avoided using
egotistical pronouns and statements and their answer was centered
around what that cat wanted
"Combination of me wanting the companionship of a cat and wanting
to adopt a cat that didn't have a home." - 5, sounds symbiotic
"My cats help during times of high stress and help me keep my anxiety
at low levels" - 1 uses "my," "me", refers to their usefulness and how
they help them. not how they help the cat or anything like that.
"Emotionally it takes stress away for me." - 1, same reasoning as above
```

Part 3 Answer regardless of if you have answered Part 1 and/or Part 2. Respond based on your activity during the time you took/take care of the animal in part 1 or part 2. If you answered both Part 1 and Part 2, choose only one of these time periods that you took/take care of either the dog or the cat.

"NumQ43" 44. How much do you (or the person financing the cat/dog's life) make a year? (59 in r)

"NumQ44" 45. Approximately how often did/do you take strolls by yourself/with human friends? (60 in r)
Once a day - 4
Once a week - 3
Once a month - 2
Every now and then or never (less frequent than once a month) - 1

"NumQ45" 46. Approximately how often did/do you dress up for holidays, such as Halloween, Christmas, et cetera? (61 in r)
Always (any chance I get) - 4
Often (5 or more times a year) - 3
Sometimes (less than 5 times a year) - 2
Never - 1

"human.insurance" 47. Did/do you buy yourself about the same variety of food when you go grocery shopping? (62 in r)
left out of data analysis

```
Always - 4
Usually - 3
```

```
Rarely - 2
Never - 1
```

"NumQ47" 48 How often do you see the doctor, under your own accord? (65 in r) *left out of data analysis*
Once or more a year - 4
Every couple/few years - 3
Less than once every three years - 2
Once/twice ever - 1

"CatQ48" 49. Do you have insurance for yourself? (64 in r)
Yes - 1
No - 0

"NumQ49" 50. Do you get yourself treatments/medicine the doctor suggests? (65 in r)
Always or Almost Always - 4
Sometimes - 3
Rarely - 2
Never - 1

"NumQ50" 51. On average, how often do you bathe? (66 in r)
Once a day - 4
Once every couple/few days - 3
Once a week - 2
Once every couple of weeks - 1

"NumQ51" 52. How often do you clip your nails? (67 in r) *left out of data analysis*
Often - 4
Sometimes - 3
Rarely - 2
Never - 1

"NumQ52" 53. How often do you upkeep your own sleeping space [washing/cleaning the bed/area]? (68 in r)
Once or more a week - 4
Once or more a month, but not every week - 3
Once or more every few months, but not monthly - 2
Never - 1

"NumQ53" 54 Approximately how often are you outdoors? (69 in r)
Often - 4
Sometimes - 3
Rarely - 2
Never - 1

"NumQ54" 55. Approximately how often do you exercise? (70 in r)
Often - 4
Sometimes - 3
Rarely - 2
Never - 1

"NumQ55" 56. Approximately how often do you try and eat healthy? (71 in r)
Always - 4
Often - 3
Sometimes - 2
Never or Rarely - 1

"NumQ56" 57. How often are your hygiene routines? (72 in r)
Every day or Every other day - 4
Every few days - 3

Once a week - 2
A couple days over a 2-week time span or less frequent - 1

"NumQ57" 58. How often do you clean your house? (73 in r)
Every day - 4
Every couple/few days - 3
Once a week - 2
Once a month or Less Often - 1

"NumQ58" 59. How often do you clean your own bedroom? (74 in r)
Every day - 4
Every couple/few days - 3
Once a week - 2
Once a month or Less often - 1

Reference

PLS Path Modeling with R by Gaston Sanchez