The Development of a Social Risk-Taking Scale

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Abstract

The construct of social risk-taking is currently measured using several pre-existing psychological scales, however these scales measure social-risk taking as part of the broader domain of risk-taking. This paper discusses the development of a 6-item scale that measures solely the construct of social risk-taking. To create the scale, data was collected from *n=223* participants, after which a one-factor analysis, as well as an analysis of the univariate descriptive statistics, and the corrected item-total correlations of the initial scale were conducted to reduce the number of scale items to the final 6. Another one-factor analysis of the final scale and a scree plot revealed the final 6-item scale to be unidimensional. Finally a validity assessment was conducted by correlating scores on the 6-item scale with a 1 item measure of risk-taking and a 1-item measure of social risk-taking. This assessment demonstrated discriminant validity between the 6-item scale and another measure of risk-taking. It also showed convergent validity between the 6-item scale and another measure of risk-taking. Overall the results of the analyses show that the final 6-item scale had a reliability below the ideal 0.8 cutoff, low generalizability, as well as low content validity. Future research should attempt to improve on the generalizability and content validity of the scale by including items that cover the violent and sexual elements of social risk-taking.

Keywords: scale development, risk-taking, social risk-taking

Introduction

This essay outlines the development of a 6-item scale intended to measure social risk-taking. Scales to measure social risk-taking are important because some amount of social risk-taking is likely necessary to effectively form new social relationships (Mineo, 2018). New social relationships are important because one's social world is continually evolving, some relationships may fade or change, and new ones are needed. Social relationships are predictive of a range of quality-of-life outcomes (Mineo, 2018).

Current Conceptualization of Social Risk-Taking

Social risk-taking is currently conceptualized as a domain of risk-taking as a whole (Weber et al., 2002). Different people handle decisions involving risk in different ways. In their 2002 paper, Weber et al. argue that differences in risk-taking can be explained by differences in risk attitude. Risk attitude is conceptualized as being composed of both a person's attitudes towards perceived risk and a person's beliefs about the riskiness of a choice situation (Weber et al., 2002). There are two primary theories put forth to explain individual differences in risk attitude: prospect theory and the risk-return framework. Prospect theory was proposed by Kahneman and Tversky (1979), it proposes that individuals assess possible gains and losses with a tendency to avoid a loss rather than potentially make an equivalent gain. This phenomenon is called loss aversion (Kahneman & Tversky, 1979). Therefore, if someone was given the choice to bet 500$ on a coin flip to win 1000$, prospect theory suggests they would prefer not to bet. Prospect theory conceptualizes risk attitude as a personality trait, with each person having a set

value on a continuum (Weber et al., 2002). However, current data does not fully support prospect theories' conceptualization of risk attitudes. For example, different methods of measurement based on prospect theory tend to result in different classifications (Slovic, 1964). In the risk-return framework, people's risk attitudes are conceptualized as the preference for risky option A = expected benefit of A + perceived risk of A (Weber & Milliman, 1997). Weber (2002) suggests two possible reasons for individual differences in risk attitudes; a preference or dislike for risks in specific domains (e.g. social risks > recreational risk) and a difference in the magnitude of benefits between specific domains. Weber's (2002) results support this as they suggest that people's tendencies towards risk-taking are domain-specific instead of representative of an underlying trait. Since our scale only measures the domain of social risk-taking, multi-domain differences in risk-taking do not need to be accounted for. Studies also suggest that there are individual, group, situational, and cultural differences in perceived risk (Weber et al., 2002). However, when these variables are controlled for perceived risk shows cross-situation, domain-specific consistency (Weber, 1997). This suggests that differences in how people perceive risks and benefits are the cause of individual differences in risk-taking attitudes and by extension differences in social risk-taking. The most common scale used in measuring social risk-taking is the Domain-Specific Risk-Taking Scale (DOSPERT) (Weber et al., 2002). The DOSPERT is a 40 item scale assessing risk-taking in five domains; financial, health/safety, recreational, ethical, and social decisions (Weber et al., 2002).

Constructs Current Research Suggests are Related to Social Risk-Taking

In our nomological network we predicted social risk-taking would be related to risk-taking, choice of political party and gender. Social risk-taking is a subdomain of risk-taking

but a person's tendency for risk-taking varies by domain (Weber, 2020) and therefore should not be positively correlated with general risk-taking. We predict social risk-taking will be correlated with choice of political party because a 2018 study by Tyagi et al. suggested social-risk-taking tended to be higher among individuals who affiliate with the Democratic party. Tyagi et al. (2018) conceptually defined social risk-taking as "a behavior with an uncertainty about the possible benefits or costs associated with the social status of an individual or an enterprise," and measured risk-taking via the DOSPERT scale. Since Tyagi et al.'s (2018) conceptual definition was similar to ours and measured the same construct, we predict social risk-taking as measured by our scale will positively correlate with the tendency to be a member of the democratic party. Evidence from Byrnes et al. (1999), suggests that while gender differences in risk-taking do exist they vary by risk-taking domain. Additionally, research by Friedl et al. (2020) suggests that women tend to be more risk-averse in terms of the social risk-taking domain. Therefore, we expect men to score higher on our social risk-taking scale.

Purpose of the Present Study

The scientific literature is currently lacking a scale that measures only the domain of social risk-taking within the broader construct of risk-taking. For this project, we created a scale designed to measure solely the construct of social risk-taking. Measuring social risk-taking is important because it is a critical part of forming new relationships. Since strong social relationships are predictive of positive outcomes such as happiness and health (Mineo, 2018), we can infer that social risk-taking is one aspect of social behaviour that contributes to improved life outcomes. For the purposes of this scale, we conceptually defined social risk-taking as non-hostile, deliberate behaviour in an unfamiliar social setting, with perceived uncertainty about

its outcome that can positively or negatively affect one's social status. We operationally defined social risk-taking as the total score on our social risk-taking scale. Therefore, higher scores on our scale should indicate a greater tendency to conduct social risk-taking behaviour. Finally, we performed a validity check by correlating total scores on our scale with a 1 item measure of risk-taking and a 1 item measure of social risk-taking. Due to the issues with prospect theory's conceptualization of risk attitude, our scale used the risk-return framework for its development. Our scale is different from other social risk-taking scales because it aims to measure only the domain of social risk-taking. We believe this scale is necessary because the most commonly used scale in risk-taking research, the DOSPERT, measures five domains of risk-taking in terms of risk behaviour and risk perception. While the subscales are extractable, the reliability of the DOSPERT's social risk taking subscale was 0.69 and 0.71 for risk behaviours and risk perceptions respectively. Our scale aims to create a more reliable measure of social risk taking. Another key difference between our social risk-taking scale and the DOSPERT subscale of social risk-taking is that the DOSPERT includes questions on intimate relations which may be inappropriate in some contexts. This means our scale can be administered in contexts where the DOSPERT would be an inappropriate option due to cultural or social reasons. Another key difference between our scale and the DOSPERT is in our conceptualization of social risk-taking; our scale specifies social risk-taking behaviour must occur in an unfamiliar social setting whereas the DOSPERT focuses predominantly on situations where you know the person you are taking social risks around. Throughout one's life, forming social connections frequently occurs in unfamiliar scenarios. Therefore, compared to the DOSPERT SCALE, our scale is more appropriate for measuring social risk-taking in this type of scenario. The final important

difference is that our scale uses fewer response options than the DOSPERT (five instead of seven) in order to combat the limits of self-knowledge. This is important because if there are too many categories people may be unsure how to respond or which category they fall into resulting in inaccurate responding.

Method

Sample

The participants were university students enrolled in PSYC 101 and PSYC 102 in the 2021 winter term at the University of British Columbia (*n=223*). Participants tended to be second-year psychology students. Demographic information on the students was not available due to confidentiality concerns.

Design

The development of our social risk-taking scale involved 3 phases. In the first phase, a gender and ethnically diverse team of five people developed a 25-item initial item pool which the team then reduced to 15 items. The second phase consisted of seeking feedback from 10 other PSYC 303 students. This consultation resulted in the removal of an additional five items from the scale and the addition of two validity check questions. Finally, in the third phase, the scale was administered to the sample group (*n=223)*. This data was then fit to a one factor model using common factor analysis. The results of the analysis were used to remove low loading items, and to perform reliability and validity analyses. In the first phase, after conceptually and operationally defining our construct we created a 25-item initial item pool. The initial item pool was reduced from 25 items to 15 items based on considerations of face and content validity. This

was done via individual researchers making arguments for each item's face and content validity followed by a vote on whether to remove the item or not. In the second phase, the risk-taking scale was tested for face and construct validity for the second time by receiving feedback from other PSYC 303 students. The students were presented with the 15-item question pool and asked to guess the construct being measured (face validity), if our questions fit our conceptual definition (content validity) and for any other feedback they had. This feedback was used to reduce the scale from 15 items to 10 items. Some items were removed for having unclear or complicated wording and others were removed for obviously measuring social risk-taking. We also choose two validity check questions to include with the scale: one measuring risk-taking and one measuring social risk-taking. We predicted that our scale would be positively correlated with both validity questions. In the third phase, the 10-item social risk-taking scale was administered to the student sample (*n=223*), and a CFA was conducted.

Results

The data gathered in the third phase was fit to a one factor model and used to remove questions with low reliability or that didn't fit with the one factor model. Four questions were removed resulting in a final scale length of six items. Finally, the total scale score from the final six questions was correlated with both validity check questions. The univariate descriptive statistics for each item of the 10 item scale do not reveal any significant floor or ceiling effects, though items 7 and 8 have means that are slightly higher than the rest of the items (*M=2.90*). Additionally, the skew values for all questions were within the ideal range of -2.0 to 2.0. Kurtosis values were also within the ideal range of -7.0 to 7.0 (Savalei, 2021a). Finally, only Q2 had a

standard deviation value below 1.0 (see Table C1). The corrected item-total correlations for the 10-item social risk-taking scale range from 0.15 to 0.56 (See Table C2). While the reliabilities for individual items were expected to be lower for individual items than on a composite scale, the reliability of items Q2, Q7, Q8, and Q10 were at a maximum of 0.32 which is far too low (Savalei, 2021b). The residual correlation matrix of a 1-factor model analysis shows many residual correlations with values above 0.1, therefore there are many shared specificities among the items (see Table C3). This indicates that the 1-factor model is not a good fit for the scale, as the construct it is measuring is likely multidimensional (Savalei, 2021c). To further investigate the multidimensionality of the scale a scree plot analysis was conducted. Though there were 3 eigenvalues above 1 on the scree plot, one of them fell below the "elbow" in the plot, therefore the scree plot method revealed that there are likely 2 factors measured by the scale. This means our initial 10 item social risk taking scale was not unidimensional, but The omega value for the 10 item scale of social risk-taking was 0.70. This omega value is slightly below the 0.8 cutoff value for reliability (Savalei, 2021c). The items dropped from the 10 item scale to create the final shortened 6 item scale were Q2, Q7, Q8, and Q10. Q2 was dropped due to a low SD, low standardized factor loadings, and low item-total correlation. Q7, Q8, and Q10 were dropped for poor content validity. This is because each of these questions had high shared specificities meaning the questions did not fit well with a one-factor model and were measuring two factors instead of one. This decreases content validity because these questions were measuring social risk-taking and another factor. Other factors contributing to questions being dropped were low inter item-total correlation and standardized factor loadings for all dropped items. Lastly, Q7 had a slightly irregular mean. The 1-factor analysis of the six-item shortened scale shows that the

standardized factor loadings range from 0.41 to 0.60 (See Table C4). These values are slightly lower than we would like as standardized factor loading estimates should be at least 0.5 and ideally 0.7 or higher (Hair et al., 2014). The Scree plot for the six-item shortened scale of social risk-taking suggests a 1-factor model best fits our data as the number of factors that fall considerably above the elbow is one (See Figure C1). This suggests that by removing Q2, Q7, Q8, Q10 we were no longer measuring the second factor they loaded onto. The omega value for the shortened six-item scale of social risk-taking was 0.71. This omega value is slightly below the 0.8 cutoff value for reliability (Savalei, 2021c). It is worth noting that this value did not change despite all the residual correlations for the 1-factor model, there are only four correlations values above 0.1: two from Q6 and another two from Q9 (See Table C5). The root mean square of residuals (RSMR) for the shortened six-item scale of social risk-taking was 0.09 which is below the common cutoff point of 0.1 (Savalei, 2021c). We performed a validity assessment by correlating total scores on our 6-item shortened scale of social risk-taking with a 1 item measure of risk-taking and a 1-item measure of social risk-taking. The correlation between our measure of social risk-taking and the measure of risk-taking was -0.05789. The p-value of this correlation was 0.3896. The correlation between our scale on social risk-taking and the validity check of social risk-taking was 0.1300. The p-value of this correlation was 0.0525.

Discussion

Our factor analysis and scree plot showed our final scale best fit with a one-factor model. The scale's reliability was slightly lower than the ideal 0.8 cutoff. One possible reason for our scale's reliability falling below the 0.8 ideal cutoff is its length. Since the loadings of our final 6-item scale were fairly homogeneous, we performed an alpha calculation on the final scale,

which resulted in an alpha value of 0.70, omega was also calculated and found to be the same. This reliability was very similar to the one from our omega calculation (0.71). Additionally, this alpha value did not change from the alpha of the 10 item scale (0.70) before we removed items. One of the properties of alpha is that it increases as the number of approximately parallel items on the scale increases (Savalei, 2021d). Therefore, we believe that though our scale better fit the one-factor model after being shortened as well as having higher factor loadings and lower residual correlations, the reliability failed to increase when items were removed because we decreased the number of items on the scale.

The correlation between our 6 item social risk-taking scale and our risk-taking validity check was -0.0579. The p-value of this correlation was 0.3896. Since the p-value is not below 0.05 the results are not statistically significant. Therefore, we cannot reject the null hypothesis that the relationship between the variables is 0. This provides evidence of discriminant validity because it shows our measure of social risk-taking is not correlated with measures of risk-taking. However, it is worth noting we initially predicted social risk taking and risk taking would be correlated, which casts doubt on our nomological network. But current research suggests risk taking should not be correlated with social risk taking as the tendency for risk taking varies between risk taking domains (Weber et al., 2002). The correlation between our scale on social risk-taking and the validity check of social risk-taking was 0.1300. The p-value of this correlation was 0.0525 which isn’t below 0.05 meaning we cannot reject the null hypothesis that the correlation between the two measures was 0. However, it's worth noting that a one item measure of social risk taking would most likely have low reliability and our scale had below the desired reliability (0.7 instead of 0.8). The unreliability of measurement could have resulted in

attenuation, which is an underestimation of a correlation due to measurement error (Savalei, 2021a). We believe this occurred when correlating the two measures of social risk taking. Therefore despite the p value being above 0.05 we argue that the two measures are still correlated, which shows our scales convergent validity.

Our study had two main limitations; low content validity and low generalizability to the population. We had low content validity because we were forbidden from including highly personal questions. This meant we were unable to include questions investigating the sexual components of social risk-taking. Since we believe the construct of social risk-taking includes social risk-taking in sexual situations our content validityis likely decreased because we didn't measure the entirety of the construct. We had low generalizability because our sample group is biased toward a specific age group and level of education. The majority of participants' data was gathered from in phase 3 are second-year students with ages ranging from 18 to 22. Furthermore, all participants had taken entry-level psychology courses. Another factor contributing to the low generalizability of the scale was that participant variables were not measured, meaning we were unable to properly control for them.

Future Research

Future research could improve on our scale by using a more generalizable sample, expanding the questions to fully capture the construct definition and writing new, better items, or rewording our scales items. By using a sample that is more representative of the general population during phase 3 of our scale construction future researchers could bypass the limitations of a sample with a similar range of ages and psychology education. This is bad because restricting the range of age is a type of range restriction and could result in lower

correlations (Savalei, 2021c). Future research could include questions related to the violent and sexual elements of social risk-taking which would increase the scale's content validity by fully capturing the domain of social risk-taking. Of course, if this was implemented precautions would have to be taken to ensure that such invasive questions didn't introduce bias into the scale. Finally, future research could focus on improving the wording of some of our questions. For example Q5 ("I reveal sensitive secrets to strangers as an ice breaker") and Q6 ("I speak my mind about disputed issues at parties") both use leading wording. In Q5 the term "sensitive" has a negative connotation as it suggests the secrets you are revealing are a big deal and may have a social impact on whoever's secret it is. This could cause social desirability bias as revealing others' secrets can be seen as socially undesirable resulting in people reporting lower scores on this item. Finally, in Q6 the term "disputed issues" has the connotation that regardless of your stance someone will disagree with you which could cause lower scores on this item as starting an argument can be seen as socially undesirable and may cause social desirability bias.

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Appendix A

Social risk-taking 15-Item Scale

Q1. I suggest music to play in social settings where there are people I do not know around.

Q2. I share personal details about myself when playing party games with strangers.
Q3. I make jokes at the expense of others who I have just met.
Q4. I engage in political conversations with people I have never met before.
Q5. I take risks in new social situations.
Q6. I act distinctively to make me look unique in new groups.
Q7.When my tastes are different than those of people I've just met I will communicate this to them.
Q8. I reveal sensitive secrets to strangers as an ice breaker.
Q9. I speak my mind about disputed issues at parties.
Q10. I will defend my opinions, no matter who is against my opinion even in unfamiliar social settings.
Q11. I will ask people what they're talking about when I'm the only one who doesn't know at parties.
Q12. I use profanity to express myself in a new social group.
Q13. I make future plans at social gatherings with people I have recently met.
Q14. I gossip about people in front of strangers.
Q15. I ask questions in class when I'm unsure of something.

Appendix B

Social risk-taking 10-Item Scale

Q1. I share personal details about myself when playing party games with strangers.
Q2. I make jokes at the expense of others who I have just met.
Q3. I engage in political conversations with people I have never met before.
Q4. I act distinctively to make me look unique in new groups.
Q5. I reveal sensitive secrets to strangers as an ice breaker.
Q6. I speak my mind about disputed issues at parties.
Q7. I will defend my opinions, no matter who is against my opinion even in unfamiliar social settings.
Q8. I will ask people what they're talking about when I'm the only one who doesn't know at parties.
Q9. I use profanity to express myself in a new social group.
Q10. I ask questions in class when I'm unsure of something.

Appendix C

Table 1

Univariate Descriptive Statistics of the 10 Item Scale

	n	M	SD	Median	Range	Skew	Kurtosis
Q1	223	2.51	1.19	2	4	0.25	-1.15
Q2	223	1.84	0.97	2	4	0.96	0.00
Q3	223	2.12	1.23	2	4	0.76	-0.67
Q4	223	2.32	1.09	2	4	0.39	-0.83
Q5	223	1.78	1.01	1	4	1.35	1.24
Q6	223	2.42	1.15	2	4	0.41	-0.84
Q7	223	2.90	1.13	3	4	0.03	-0.90
Q8	223	2.90	1.15	3	4	-0.06	-1.00
Q9	223	2.35	1.23	2	4	0.55	-0.78
Q10	223	2.71	1.16	3	4	0.21	-0.87

Table 2

Corrected Item-Total Correlations of the 10 Item Scale

	n	raw.r	std.r	r.cor	r.drop	M	SD
Q1	223	0.55	0.55	0.50	0.39	2.5	1.19
Q2	223	0.47	0.49	0.38	0.32	1.8	0.97
Q3	223	0.61	0.60	0.56	0.46	2.1	1.23
Q4	223	0.49	0.50	0.41	0.33	2.3	1.09
Q5	223	0.52	0.54	0.49	0.38	1.8	1.01
Q6	223	0.69	0.68	0.67	0.56	2.4	1.15
Q7	223	0.49	0.48	0.40	0.32	2.9	1.13

Q8	223	0.47	0.46	0.36	0.29	2.9	1.15
Q9	223	0.59	0.58	0.50	0.43	2.3	1.23
Q10	223	0.34	0.34	0.19	0.15	2.7	1.16

Table 3

Residual Correlations of the 10 Item Scale

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q1	0.75	0.00	0.00	0.06	0.28	-0.10	-0.13	-0.01	-0.03	-0.13
Q2	0.00	0.87	-0.04	0.07	0.01	-0.08	-0.03	0.02	0.07	0.10
Q3	0.00	-0.04	0.66	0.03	0.01	0.10	0.03	-0.15	-0.08	0.00
Q4	0.06	0.07	0.03	0.84	0.14	-0.14	-0.21	0.01	0.08	-0.03
Q5	0.28	0.01	0.01	0.14	0.77	-0.08	-0.12	-0.15	-0.09	-0.08
Q6	-0.10	-0.08	0.10	-0.14	-0.08	0.53	0.21	0.06	0.01	0.03
Q7	-0.13	-0.03	0.03	-0.21	-0.12	0.21	0.85	0.11	0.01	0.12
Q8	-0.01	0.02	-0.15	0.01	-0.15	0.06	0.11	0.89	0.13	0.03
Q9	-0.03	0.07	-0.08	0.08	-0.09	0.01	0.01	0.13	0.76	0.01
Q10	-0.13	0.10	0.00	-0.03	-0.08	0.03	0.12	0.03	0.01	0.97

Table 4

1-Factor Analysis of the 6-Item Scale

	MR1	h2	u2	com
Q1	0.59	0.35	0.65	1
Q3	0.60	0.36	0.64	1
Q4	0.45	0.20	0.80	1
Q5	0.60	0.36	0.64	1

Q6	0.56	0.31	0.69	1
Q9	0.41	0.17	0.83	1

Table 5

Residual Correlations of the 6-Item Scale

	Q1	Q3	Q4	Q5	Q6	Q9
Q1	0.65	-0.06	-0.01	0.16	-0.08	-0.03
Q3	-0.06	0.64	-0.01	-0.06	0.17	-0.04
Q4	-0.01	-0.01	0.80	0.06	-0.11	0.09
Q5	0.16	-0.06	0.06	0.64	-0.08	-0.10
Q6	-0.08	0.17	-0.11	-0.08	0.69	0.11
Q9	-0.03	-0.04	0.09	-0.10	0.11	0.83

Figure 1

Scree Plot for the 10-Item Scale

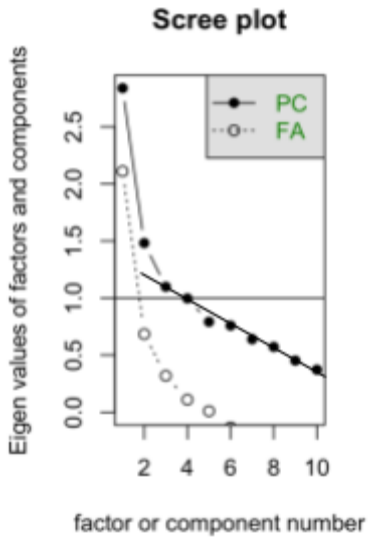
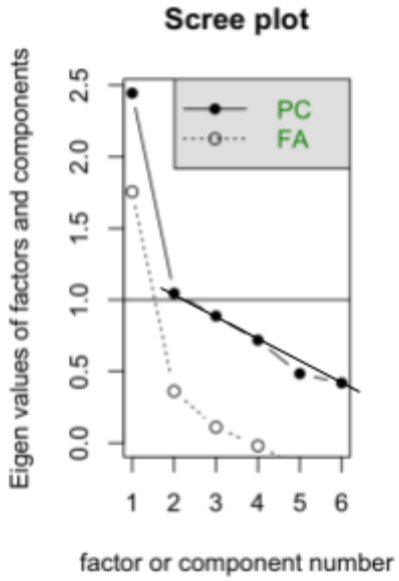


Figure 2

Scree Plot of the 6-Item Scale



R Code

```
load('g3data.Rdata')
setwd("~/Desktop")
library('psych')
sapply(data, levels)
numdata <- data.frame(lapply(data, as.numeric))
describe(numdata) #univariate descriptive statistics of the 10 item scale
alpha(numdata) #corrected item-total correlations
fa.out<-fa(numdata,nfactors=1) #1-factor analysis of the 10 item scale
fa.out
loadings<-fa.out$loadings # coefficient omega of the 10 item scale
errorvars<-fa.out$uniquenesses
omega<-(sum(loadings))^2/((sum(loadings))^2+sum(errorvars))
omega
round(fa.out$residual, 2) #residual correlations of the 10 item scale
numdata6item<-numdata[c('Q1','Q3', 'Q4', 'Q5', 'Q6', 'Q9')]
fa.out6item<-fa(numdata6item,nfactors=1) #1 factor analysis of 6 item scale
fa.out6item
loadings6item<-fa.out6item$loadings # coefficient omega of 6 item scale
errorvars6item<-fa.out6item$uniquenesses
omega6item<-(sum(loadings6item))^2/((sum(loadings6item))^2+sum(errorvars6item))
omega6item
round(fa.out6item$residual, 2) #residual correlations of the 10 item scale
scree(numdata6item)# scree plot of 6 item)
```

```
scree(numdata)# scree plot of 10 item
setwd("~/Desktop")
load('vData.Rdata') #validity check
load('g3data.Rdata')
numdatavalidity<- data.frame(lapply(vData, as.numeric))
View(numdatavalidity)
G3val<-data.frame(numdatavalidity$G3V)
View(G3val)
G4val<-data.frame(numdatavalidity$G4V)
numdatavalidity2<-data.frame(lapply(data, as.numeric))
numdataf <- data.frame(numdatavalidity2[1:223, c(1, 3, 4, 5, 6, 9)])
test1<-data.frame(rowSums(numdataf))
View(test1)
cor(G3val$numdatavalidity.G3V, test1$rowSums.numdataf,use="complete.obs")
cor(G4val$numdatavalidity.G4V, test1$rowSums.numdataf,use="complete.obs")
reg2<-lm(G4val$numdatavalidity.G4V ~ test1$rowSums.numdataf)
summary(reg2)
reg3<-lm(G3val$numdatavalidity.G3V ~ test1$rowSums.numdataf)
summary(reg3)
```