



Examination:	20566 Marketing Methods and Analysis
Summer Term 2013	
Examiner:	Prof. Dr. Marko Sarstedt

Last Name	
First Name	
Matriculation Number	
Faculty	

This is an open-book exam, i.e., you are allowed to use everything (dictionaries, lecture scripts, books...) in paper form and a non-programmable pocket calculator without communication functions.

This exam has 7 pages and yields 60 points.

Don't remove the stapling of the exam!

The duration of the exam is one hour (60 min.).

The exam has 3 tasks. Each must be answered. Answers can be given in German or English.

Please round to 2 decimals-unless indicated otherwise. Assume a significance level of $\alpha = 0.05$.

Do not just write the result in the computational tasks. Show how you got to your result.

Please make sure in your own interest that your approach to solving the tasks is comprehensible to others.

Task 1	/ 5
Task 2	/ 25
Task 3	/ 30
Total points	/ 60
Grade	
Signature	



Task 1 (5 points)

a) What is the scale on which the following variables are measured? (3 points)

- the color of a car
- the number of times a customer makes a complaint
- grades in a test

b) Imagine you are working in a market research firm. Your client wants to determine the effect on sales in € if he decreases his advertising budget and increases the prices for his products (both variables measured in €).

On which scale levels are the three variables measured? Which analysis method would you apply in the given problem? Please give reasons for your answer. (2 points)



Task 2: Automatic Interaction Detection at UGVO (25 points)

The UGVO insurance group uses the Net Promoter Score (NPS) as a management concept. According to the NPS, customers can be classified in promoters, passives, and detractors. As it is the company's goal to maximize the number of promoters, they hire you to find out what makes customers become a promoter. Unfortunately, the database is somewhat poor: UGVO's market research could only provide a list of 20 customers that have been surveyed with respect to their perception of UGVO's image (positive = "+", negative = "-") and the perceived value for money, where respondents could choose between the values "rather fair" and "poor."

Customer	NPS-Category	Image	Value for Money
1	Promoter	+	rather fair
2	Detractor	-	poor
3	Detractor	-	poor
4	Promoter	+	rather fair
5	Promoter	+	poor
6	Promoter	-	rather fair
7	Detractor	-	poor
8	Detractor	-	poor
9	Passive	+	poor
10	Promoter	+	rather fair
11	Detractor	-	poor
12	Passive	-	poor
13	Passive	-	poor
14	Promoter	+	rather fair
15	Detractor	-	poor
16	Detractor	+	poor
17	Passive	-	poor
18	Promoter	+	rather fair
19	Passive	-	poor
20	Passive	-	poor



Please answer the following questions:

- a) Without applying any method: Why will the method not be able to fully explain what makes a customer become a promoter? (5 points)
- b) Which attribute can best explain a promoter (as opposed to the group passive/detractor)? Use the Automatic Interaction Detection (AID) method to answer this question. (15 points)
- c) Given the results of the first level, would you expect a notable improvement of a second level analysis? (You are not supposed to do additional calculations but you may, of course, if you think that is needed to answer the question). (5 points)

Task 3 (30 points)

Suppose that a company wanted to assess the effect of three marketing promotion tools (variable = *promotion*) on the sales (variable = *sales*) of a new soup brand. The three promotion types which are carried out in shops are as follows:

- a large poster (value of variable *promotion* = *display*) of the product in the shop
- a free tasting of the soup (value of variable *promotion* = *tasting*) in the shop, and
- a special decoration around the product shelf in which the soup is being sold (value of variable *promotion* = *decoration*).

The dependent variable *sales* is measured on a continuous scale. Each of these special promotions was tried out in different stores (30 stores in total). The size of the stores (variable = *storesize*) is either *small* or *large*.

Use the SPSS outputs provided on the following pages to answer the following questions.

- a) Without considering the form of promotional tool, do sales in small and large stores differ?
Please clearly indicate which output you considered. (5 points)
- b) You are now interested in whether the type of promotional tool affects the sales volume. Please describe a potential problem that may arise when comparing the groups using independent samples t-tests. (5 points)
- c) In the next step, you want to use a one-way ANOVA to assess the effect of the type of promotional tool used on sales. Is a one-way ANOVA applicable in this case? Check its assumptions. (10 points)



- d) Is there a significant difference in the sales depending on the form of promotional tool? If yes, which ones differ significantly regarding the sales. Justify your opinion! (7 points)
- e) Does the combination of store size and the form of promotional tool influence sales significantly? (3 points)

Running the analyses in SPSS has yielded the following output:

Group Statistics

	storesize	N	Mean	Std. Deviation	Std. Error Mean
sales	small	15	5,80	2,396	,619
	large	15	12,60	3,135	,809

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
sales	Equal variances assumed	1,675	,206	-6,674	28	,000	-6,800	1,019	-8,887	-4,713
	Equal variances not assumed			-6,674	26,196	,000	-6,800	1,019	-8,894	-4,706

Tests of Normality

	promotion	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
sales	display	,166	10	,200*	,946	10	,627
	tasting	,166	10	,200*	,968	10	,872
	decoration	,150	10	,200*	,945	10	,611

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction



Descriptives

sales

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
					display	10		
tasting	10	11,50	3,028	,957	9,33	13,67	7	17
decoration	10	11,40	4,142	1,310	8,44	14,36	5	17
Total	30	9,20	4,413	,806	7,55	10,85	2	17

Test of Homogeneity of Variances

sales

Levene Statistic	df1	df2	Sig.
6,279	2	27	,006

ANOVA

sales

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	303,800	2	151,900	15,714	,000
Within Groups	261,000	27	9,667		
Total	564,800	29			

Robust Tests of Equality of Means

sales

	Statistic ^a	df1	df2	Sig.
Welch	25,373	2	15,695	,000

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: sales

	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
						promotion	promotion
Games-Howell	display	tasting	-6,800*	1,088	,000	-9,65	-3,95
		decoration	-6,700*	1,408	,001	-10,47	-2,93
	tasting	display	6,800*	1,088	,000	3,95	9,65
		decoration	,100	1,622	,998	-4,07	4,27
	decoration	display	6,700*	1,408	,001	2,93	10,47
		tasting	-,100	1,622	,998	-4,27	4,07

*. The mean difference is significant at the 0.05 level.



sales

	promotion	N	Subset for alpha = 0.05	
			1	2
	display	10	4,70	
Ryan-Einot-Gabriel-Welsch	decoration	10		11,40
Range	tasting	10		11,50
	Sig.		1,000	,943

Means for groups in homogeneous subsets are displayed.

Between-Subjects Factors

	Value Label	N
1	display	10
promotion 2	tasting	10
3	decoration	10
1	small	15
storesize 2	large	15

Tests of Between-Subjects Effects

Dependent Variable: sales

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	432,483 ^a	5	86,497	15,689	,000
Intercept	1366,998	1	1366,998	247,949	,000
promotion	67,624	2	33,812	6,133	,007
storesize	80,506	1	80,506	14,602	,001
promotion * storesize	15,741	2	7,871	1,428	,260
Error	132,317	24	5,513		
Total	3104,000	30			
Corrected Total	564,800	29			

a. R Squared = ,766 (Adjusted R Squared = ,717)