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NON-LINEAR NATURE OF RESPONDENTS' SOCIALATTITUDES

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Abstract

The article considers interpretations of six dependencies with a maximum and a minimum in the framework of a study on parameters of the respondents' social attitudes. They are "The attitude to the statement that it is possible to establish mutual understanding and cooperation between the rich and the poor", "The sensation of closeness to those who have achieved an indisputable success and material wellbeing", "The sensation of closeness to people of the same generation (age)", "The sensation of closeness to people having the same income". Besides there is "Importance of maintaining good businesslike and formal relations with an immediate superior in choosing a job", "The sensation of closeness to those living nearby (neighbors)", whose contents are supplemented with components of a self-portrait: "A self-confident type", and "An idiosyncratic type". For demonstrating the author's method of studying non-linear dependencies, a brief study is made of a model sample with mathematical functions.

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Keywords: Material wellbeing, non-linearity, comparative weightiness, factor of the connection strength, coefficient of correlation.

1. Introduction

Most researchers still prefer a correlation analysis, while studying the cause and effect relations in psychological science, and despite numerous unconscious (or perceived) errors, continue to write interpretations of psychological processes based on the results of its use, and to give practical recommendations. This applies in particular to "significant" correlations, when a very weak relation is given for worthy of attention. In this case, a false linear model often replaces the real non-linear one, or the non-linear model is simply not fixed.

2. Problem Statement

The following statistics show the problem and its relevance. In materials of "The 12th European Congress of Psychology (Istanbul 2011 04-08 July)", the term "non-linear" or "nonlinear" occurs (except our materials, 10 reports) only in 3 theses (in a total of around 3000 theses). Farther on, the situation does not change dramatically either: in materials of the latest European congress "The 14th Conference of the European Congress of Psychology (Milan, Italy, 7-10 July, 2015)" the term "non-linear" or "nonlinear" occurs (except our materials, 12 reports) only in 4 theses (in a total of around 2500 theses). The analysis of the articles allows a conclusion that most psychologists detect relations between the parameters under study and use for this purpose mostly the correlation analysis.

One can observe a massive exit (intentional or unintentional) into an area of low values of the correlation coefficient when "a zero correlation" becomes sufficient to describe the relations as strong. This results from the shortage of strong linear relations when sophisticated psychological objects, mainly non-linear by nature, come under study.

3. Research Questions

The authorial method (Basimov, 2012, 2016) for statistical relations research was tested in various areas of psychology: parenthood (Padurina, 2012), work (Basimova, 2016a), semantic sphere (Ilinyh, 2012a), personality (Basimova, 2016b).

Various authors have studied tolerance: A Typology of tolerance (Zhmyrova, 2006; Kleiberg, 2012); Tolerance as an object of comprehensive analysis (Kadyrova, 2012); Tolerance in interaction with the outside world (Chebykina, 2012), etc. However, tolerance is a non-linear subject of research for us, which analysis requires method of studying the non-linear relations that we are going to demonstrate further on separate examples.

Going beyond linear models is a prerequisite for transition to a synergistic way of thinking (Knjazeva, 2005; Krylov, 2000; Mainzer, 1994; Danilov, 2016), as many psychologists often speak about it, but at the same time, they study exclusively linear dependencies.

4. Purpose of the Study

The article considers examples of simplest non-linear dependencies between the types of social attitude (tolerance) as well as the relation of the social attitude parameters and a personal self-portrait.

By definition, the linear dependencies are symmetrical and it is of no consequence for them what the cause (an independent variable) is and what the effect (a dependent variable) is. This is determined by the researcher's will and is often dictated by the researcher's interests, his concept and model, his theoretical arguments, and subjective approaches to the subject of research. The correlation method and the linear relations detected by him give no chance of choosing the direction of the relation. In this case, the cause and the effect are equivalent and may be interpreted by the researcher arbitrarily and at his own discretion.

However, these are precisely the dependencies that a man, by virtue of his usual logic, predicts, formulates as research hypotheses, infers. As a result, it often seems to him that other regularities just do not exist. As for more sophisticated regularities in the psychological or sociological environment, they are normally unpredictable and call for an experimental study and additional analytical work not restricted by linear concepts.

5. Research Methods

In this study, the author's (Basimov, 2012, 2016) model for studying statistical relations has been used. The model is based on the generalized method of multiple comparison. Linear correlations are defined as a special case therein, and single correlations are the benchmarks for standardizing the strength of relation coefficients. The relation model is the distribution of values of all parameters considered in the problem for groups-quart (or triad, quinter) on each parameter by levels of comparative weightiness.

6. Findings

Let us pass over from the mathematics to the analysis of individual interesting relations in the framework of the subject dealt with. The data processing results are taken from the sociological research, which presented a wide spectrum of problems, such as training, professional work, tolerance and psychological typology.

The respondents' psychological portrait was determined on the basis of the J. Oldham and L. Morris method used for defining "The personality type" and "The probability of disturbance". The proposed method presents 14 personality types.

First, let us consider 4 dependencies between the parameters of the sociological content, and then 2 dependencies in which the cause is components of the personality type. The task of studying the relations was dealt with in the model for the independent parameter quarters.

1. Dependence of parameter "**Attitude to the statement that a mutual understanding and cooperation between the rich and the poor is possible**" (Y) on parameter "**The sensation of closeness to those who have achieved an indisputable success and material wellbeing**" (X) as comparative weightiness of parameter Y for quarters on scale X:

Quarters on scale X		Comparative weightiness of scale X for quarters
X-4		+3770
X-3		+9000
X-2		+2213
X-1		-28299

Factor of the connection strength (SV) = 0.53

(feedback is weak = 0.32)

Coefficient of correlation (R) = 0.25

As it happens, even the related parameters like "The attitude to the statement that it is possible to establish mutual understanding and cooperation between the rich and the poor" and "The sensation of closeness to those who have achieved an indisputable success and material wellbeing" are interconnected not by the simplest of ways (the correlation coefficient is 0.25, which testifies to a weak linear relation). The dependency is primarily single-sided while the dependent parameter grows very rapidly at the first stage of the independent parameter growth (transition from 1st to 2nd quarter). What happens subsequently is actually a stabilization of the dependent parameter with a small maximum on 3rd quarter.

The chart of dependence of the parameter "Attitude to the statement that a mutual understanding and cooperation between the rich and the poor is possible" on the parameter "The sensation of closeness to those who have achieved an indisputable success and material wellbeing" is given in Figure 1.

	1 kva	2 kva	3 kva	4 kva
Y	-28299	2213	9000	3770

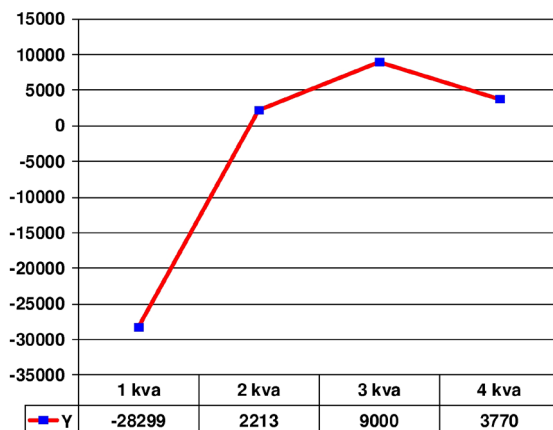|	1 kva	2 kva	3 kva	4 kva
Y	-3	-34004	277	7107

Figure 01. The chart of dependence of the parameter "Attitude to the statement that a mutual understanding and cooperation between the rich and the poor is possible" on the parameter "The sensation of closeness to those who have achieved an indisputable success and material wellbeing"
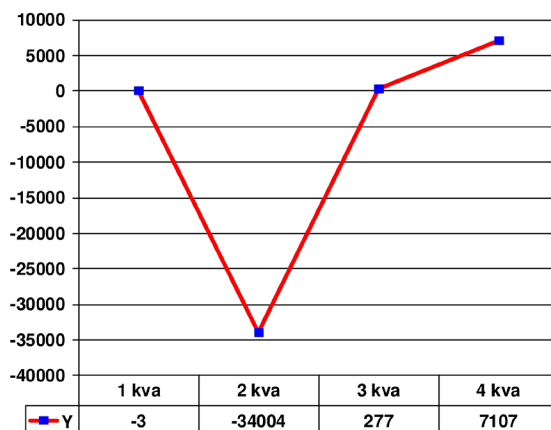
Figure 02. The chart of dependence of the parameter "The sensation of closeness to people of the same generation (age)" on the parameter "The importance of maintaining good businesslike and formal relations with the immediate superior in choosing a job"

2. Dependence of parameter "**Sensation of closeness to people of the same generation (age)**" (Y) on parameter "**Sensation of closeness to people of the same income**" (X) as comparative weightiness of parameter Y for quarters on scale X:

Quarters on scale X		Comparative weightiness of scale X for quarters
X-4		+35277
X-3		+4306
X-2		-14939
X-1		-1822

Factor of the connection strength (SV) = 0.79

(feedback is weak = 0.51)

Coefficient of correlation (R) = 0.36

Despite the initial reduction of the dependent parameter "Sensation of closeness to people of the same generation (age)", we subsequently observe its significant growth at the increase of the parameter "Sensation of closeness to people having the same income." Thus, an income, as a measure of closeness between the people, fosters the nearness between the contemporaries. The reverse dependency is significantly weaker (0.51 as compared to 0.79 in relation to the Factor of the connection strength). As for the initially small minimum (2nd quarter), it makes the correlation coefficient value relatively small so that this dependency can be regarded, in terms of the linear approach, only as a minor trend.

The two following dependencies demonstrate, as a cause, the parameter "Importance of maintaining good businesslike and formal relations with an immediate superior in choosing a job". Thus, the relations in the professional area are a cause of other interpersonal relations, which are definitely single-sided dependencies.

3. Dependence of the parameter "**The sensation of closeness to people of the same generation (age)**" (Y) onthe parameter "**The importance of maintaining good businesslike and formal relations with the immediate superior in choosing a job**" (X):

Quarters on scale X		Comparative weightiness of scale X for quarters
X-4		+7107
X-3		+227
X-2		-34004
X-1		-3

Factor of the connection strength (SV) = 0.94

(feedback is weak = 0.25)

Coefficient of correlation (R) = 0.22

A strong and obviously singe-sided dependency shows that the sensation of closeness to people of the same generation (age) falls dramatically in the formation and realization of a personal problem of making an important choice of the profession and understanding the importance of maintaining good businesslike and formal relations with one's immediate superior (2nd quarter). This is a strong minimum (comparative weightiness = -34004), but subsequently, on 4th quarter, we have the values of a dependent parameter that are significantly larger than the initial ones (+7101 as compared to -3).

The chart of dependence of the parameter "The sensation of closeness to people of the same generation (age)" on the parameter "The importance of maintaining good businesslike and formal relations with the immediate superior in choosing a job" is given in Figure 2.

In this case, if we remain in the framework of linear notions, we shall miss this complex process, since following the rules adopted by the sociologists' and psychologists' community, we shall regard the very weak correlation (0.22) as "meaningful" and construe the dependency as a proportionately increasing (growing) function.

The reverse dependency (dependence X on Y) is extremely weak (0.25).

4. Dependence of the parameter "**The sensation of closeness to those living nearby (neighbors)**" (Y) on the parameter "**The importance of maintaining good businesslike and formal relations with the immediate superior in choosing a job**" (X) as comparative weightiness of parameter Y for quarters on scale X:

Quarters on scale X		Comparative weightiness of scale X for quarters
X-4		+5158
X-3		-2688
X-2		-26742
X-1		+1399

Factor of the connection strength (SV) = 0.75

(feedback is weak = 0.06)

Coefficient of correlation (R) = 0.11

This dependency is also strong and obviously single-sided. But now it shows that the sensation of closeness to those living nearby (neighbors) also falls dramatically in the formation and realization of a personal problem of the importance of maintaining good businesslike and formal relations with the immediate superior in choosing a job (2nd quarter).

The reverse dependency (dependence X on Y) is extremely weak (0.06)

Further on, let us consider, on the basis of two dependencies, a psychological aspect which emerges in the study on the relations of personality types in the personal self-portrait and social attitudes.

5. Dependence of the parameter "**The sensation of closeness to those having the same income**" (Y) onthe parameter "**Self-confident type**" (X):

Quarters on scale X		Comparative weightiness of scale X for quarters
X-4		-22509
X-3		-393
X-2		+17815
X-1		+3189

Factor of the connection strength (SV) = 0.69

(feedback is weak = 0.42)

Coefficient of correlation (R) = -0.22

As the chart shows, a slight growth of self-confidence (transition from 1st to 2nd quarter) fosters the mutual understanding (comparative weightiness = +17815) with people having the same income. However, the further growth of self-confidence yields a reverse and much stronger result, i.e. the self-confident type starts feeling extreme remoteness (-22509) from people having the same income.

The self-confident persons particularly stand out from among others. They are leaders and the focus of attention in the community and family. They have a developed sense of self-respect and self-actualization. They are able to attract others to fulfillment of the allotted tasks. The self-confident people are aware of "having to perform a special mission in the world." People of this type expect from others only positive attitude to them. They accept compliments, praise, and delighted acclaim of them complacently and with a good grace. However, the people of strongly pronounced self-confident type (4th quarter, 25% of respondents) are extremely far (-22509) from the sensation of closeness to people having the same income. This happens even though at the stage of formation of self-confidence (2nd quarter) a sudden rise is observed in the positive direction (+17815) in the sensation of closeness to people having the same income.

In this case, if we remain in the framework of linear notions, we shall miss this complex process, since following the rules adopted by the sociologists" and psychologists' community, we shall regard the very weak correlation (-0.22) as "meaningful" and construe the dependency as a proportionately decreasing function.

6. Dependence of the parameter "**Sensation of closeness to those who have achieved an indisputable success and material wellbeing**" (Y) on the parameter "**Type (C) Idiosyncratic**" (X):

Quarters on scale X		Comparative weightiness of scale X for quarters
X-4		+2588
X-3		-15588
X-2		-2867
X-1		+15142

Factor of the connection strength (SV) = 0.61

(feedback is weak = 0.11)

Coefficient of correlation (R) = -0.08

The sensation of closeness to those who have achieved an indisputable success and material wellbeing depends on the parameter of personal typology known as "The idiosyncratic type." This is a very strong dependency and still more single-sided (the Factor of the connection strength is 0.61 as compared to 0.11 in the reverse direction): the psychological type is definitely a cause for feeling a closeness to those who have achieved an indisputable success and material wellbeing.

The people of idiosyncratic type are dreamers and outstanding freaks. They are eccentric, self-oriented and supported by their own thoughts and convictions. It is of no consequence for them if their approach to life is accepted or rejected by others. They are self-orientated, independent and open to everything out of the ordinary. The respondents of an unpronounced idiosyncratic type (1st quarter) display

a fairly strong sensation of closeness to those who have achieved an indisputable success and material wellbeing (comparative weightiness = +15142). A more pronounced idiosyncratic component of the type of personality (2nd and 3rd quarters) fosters a fast reduction of the dependent parameter (up to -15588 as per the comparative weightiness on 3rd quarter).The sensation of closeness to those who have achieved an indisputable success and material wellbeing is not typical of the idiosyncratic personality type, whose representatives are shy, outwardly dispassionate, and, in a conversation seem to be self-conscious, unable to find the right word and follow the train of the conversation. They are distrustful, display excessive social anxiety, especially in meeting with strangers. They prefer solitude, seeking satisfaction in their own inner world. Some of such people believe they possess extraordinary capabilities required for some special mission that is crucial for the world. However, for representatives of the pronounced idiosyncratic type (4th quarter, 25% of respondents), the sensation of closeness to those who have achieved an indisputable success and material wellbeing grows (+2588), though the values in this case are considerably lower than the initial ones (+15142).

The dependency with a minimum that is being considered is close to symmetry, which is why the correlation coefficient is extremely small relative to the absolute value (-0.08) and presents no interest even for adherents of the "meaningful" correlation.

7.   Conclusion

Thus, we considered two types of errors while studying the dependencies in psychology. Type 1 error: the dependence is not determined by correlation analysis, but it is present, it is the simplest non-linear, primarily with a maximum or a minimum (dependencies 1-2). Type 2 error: correlation analysis identifies a "significant" correlation, but it is very weak. The researcher usually considers it as a linear model worthy of attention as is customary in the psychological community. However, a strong simple non-linear dependence lies behind it (dependencies 3-6). Such mistakes are quite a lot and they turn many conclusions of "scientific" psychology to almost pseudoscientific. Recommendations based on such results will not be able to help the practical psychologist in his work, only intuition will help him out.

Acknowledgments

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