

# **The Interplay of “Big Five” Personality Factors and Metaphorical Schemas: A Pilot Study with 20 Lung Transplant Recipients**

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*The aim of the present study was to investigate the interplay between personality factors and metaphorical schemas. The “Big Five” personality factors of 20 patients after lung transplantation were examined with the NEO-FFI. Patients were questioned about their social network, and self- and body-image. The interviews were assessed with metaphor analysis. Significant positive correlations were found between “extraversion” and metaphors for acoustics, play/sport and economy, furthermore between “openness to experience” and metaphors for acoustics, container, battle, illness. A positive correlation was also found between “openness to experience” and metaphor frequency. Significant negative correlations were found between “conscientiousness” and metaphors for illness. The results indicate that personality factors may correspond with certain implicit metaphorical schemas. Key Words: Personality, Big Five, Cognitive Schemas, Metaphor, and Lung Transplantation*

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In cognitive behaviour therapy, personality is conceptualized as a relatively stable cognitive organization of schemas, composed of different cognitive, affective, motivational, and instrumental “schemas” (Beck, Freeman, & Davis, 2004). These mental structures are hypothesized to stimulate selective processing of information. Some cognitive schemas concern self-evaluation, others the evaluation of the social environment. Personality disorders are characterized by an implicit information processing bias or, generally spoken, by maladaptive cognitive schemas (Dreesen, Arntz, Hendriks, Keune, & van den Hout, 1999). If for example a patient, who by nature is predisposed to overreact to rejection actually experiences rejection as a child, the cognitive schema or belief “I am unlovable” can be formed. With recurring experiences of rejection, the maladaptive belief “I am unlovable” becomes structuralized and influences psychological information processing later on.

In the past 25 years, there has been a growing interest in research on implicit concepts or schemas of metaphorical nature. It is hypothesized that information processing as well as behaviour may be influenced by metaphorical schemas or concepts, based on cognitive processes described in cognitive personality theory (Lakoff & Johnson, 1980; Moser, 2000). The use of metaphors is a powerful cognitive tool to relate abstract and complex knowledge to concrete experiences. Metaphors are assumed not only to have representational functions, but to provide also the basis for understanding, decision-making, and action (Dutke, 1994, Vosniadou & Ortony, 1989). As shown in the experiments of Gentner and Gentner (1983), for example, if people understand the functioning of an electric light switch in terms of an analogy to the water cycle, they see electrical current as functionally equivalent to water pressure, the battery as a water tank, and the light switch as a kind of valve that is used to interrupt the flow of water. This metaphorical model of electricity enables them to understand the abstract phenomenon of “electric current.” It also provides a useful basis for problem solving, such as for repairing a non-functioning light switch (Gentner & Gentner, 1983). Although the water metaphor is not correct in technical terms, the functional analogy of electric current and water cycle is sufficient for a “naïve” understanding of the abstract concept of electricity and for everyday problem-solving skills.

In cognitive linguistics and cognitive psychology, a metaphor is defined as an analogy (Anderson, 1996; Lakoff, 1987; Lakoff & Johnson, 1980). A metaphor consists of the projection of one schema (the source domain of the metaphor) onto another schema (the target domain of the metaphor). The schema of the metaphor source domain, for example “path,” has a typical topology consisting of a limited number of slots, such as starting point, final point, and direction in the case of a “path.” If for example, a lung transplant recipient in our study referred to drugs as “little bombs,” she projected the idea to explode or to destroy from the source domain of “battle” into the target domain of “medication.” The metaphorical schema of “war” provides insights into how the drug is experienced: The metaphorical concept of treatment includes the idea that drugs attack and destroy one’s own body (e.g., in the form of side-effects). In this case, the metaphor source domain was “battle,” the metaphor was “drugs are little bombs,” and the metaphorical schema was MEDICAL TREATMENT IS WAR.

In congruence with cognitive personality theory, we assumed that cognitive schemas form a fundamental base of personality and are expressed metaphorically in interpersonal interaction, and that consequently, specific metaphorical schemas may be associated with specific personality traits or factors. In other words, metaphoric schemas could be understood as one linguistically manifest category of cognitive schemas that shape specific aspects of personality, such as the “Big Five” personality factors. From a psychoanalytical point-of-view, these cognitive schemas could be interpreted as more or less unconscious fantasies that find some expression in metaphorical statements, but also direct our emotions and behaviour (Arlow, 1979; Borbely, 1998).

The idea of this study was to investigate the association between Big Five personality factors and the use of metaphors, based on the framework of cognitive personality. Based on this framework we expected that certain personality factors (e.g., extraversion or openness to experience) should be associated with certain metaphor source domains such as an (open) container.

We assessed the personality factors according to the Big Five personality model (McCrae & Costa, 1985, 1987; McCrae & John, 1992) and the use of metaphorical schemas in a sample of 20 people having received a lung transplant. To the best of our knowledge there are no studies yet that have investigated the association between the Big Five personality factors and the use of metaphors in a clinical sample. We present the statistical correlations between the Big Five personality factors and metaphorical schemas, and clarify the statistical results by means of a qualitative metaphor analysis.

## **Methods**

### **Patients and Study Design**

Twenty patients were selected for the current interview study among participants of an earlier questionnaire enquiry, done with 50 patients who had undergone lung transplantation at least 12 months previously, and who spoke German fluently. The questionnaire used in the previous study contained standardized test instruments (Goetzmann, Scheuer, Naef, Buddeberg, et al., 2005; Goetzmann, Scheuer, Naef, Vetsch, et al., 2005). One psychometric instrument was the NEO Five-Factor Inventory (NEO-FFI) to assess personality factors (“Big Five”). The selection of the patients who were invited for an interview was based on an external rating: The attending doctors rated patients’ compliance, using the item “How do you assess patients’ compliance in the last 6 months?” on a 3-point Likert-scale (“high” – “moderate” – “low”). By this procedure, we achieved a sample consisting of ten “high compliance,” four “low compliance,” and six “moderate compliance” patients. We used the criterion of a patient’s compliance because one of our study objectives was to investigate differences between high, moderate, and low compliant patients. In this article, however, the interplay between personality factors and metaphorical schemas is investigated (not the patient’s compliance behaviour, see Goetzmann et al., 2007).

The described procedure comprises a mixed method study design: In the questionnaire study (n=50), we applied a quantitative analysis using the NEO-FFI; in the following interview study (n=20), we investigated the metaphors patients used when speaking about themselves, their bodies, or significant others. A quantitative analysis of the metaphor categories allowed us to calculate correlations between the personality factors (NEO-FFI) and each patient’s use of metaphors, and to investigate statistical associations between personality and metaphorical schemas.

### **NEO Five-Factor Inventory (NEO-FFI)**

Over recent decades, studies in personality psychology have identified consistent personality factors, which are now designated as the “Big Five” (McCrae & Costa, 1985, 1987; McCrae & John, 1992). The “Big Five” are based on a descriptive personality model. Various sources were used to identify these personality dimensions. Adjectives related to certain individual characteristics were cluster-analytically registered, and personality characteristics were collected by means of questionnaire investigations. The NEO Five-Factor Inventory (NEO-FFI) measures the five fundamental dimensions of personality: (1) “neuroticism” (annoyed, embarrassed, having unrealistic ideas and little

control over needs); (2) “extraversion” (active, assertive, talkative, energetic, optimistic); (3) “openness to experience” (inquisitive, possessing independent judgment, interested, placing value on new experiences); (4) “agreeableness” (altruistic, sympathetic, understanding, benevolent, accommodating); and (5) “conscientiousness” (persevering, precise, dependable, determined, systematic). The German version (Borkenau & Ostendorf, 1993) of the NEO Five-Factor Inventory (NEO-FFI) by Costa and McCrae (1992) was used. This version contains 60 items recorded on a 5-point Likert scale.

## **Interviews and Structure of the Interview Manual**

The interviews took place four to twelve weeks after the questionnaire enquiry. They were recorded with a mini-disc recorder and transcribed according to the standard procedure for interview transcripts in psychology (Wittowski, 1994). The patients were informed about the study, both orally and in writing. At the moment of the interview, the interviewer was not informed about the external compliance-rating. The Ethics Board of the University Hospital Zurich approved the study.

The semi-standardized interviews were carried out on the basis of a manual containing nine questions in total. Patients were asked to describe themselves and their body, including the transplanted lung, and their subjective experience of the medication. Further, they were asked which people were currently the most significant in their life. They were requested to describe these people, and their attitudes and feelings towards them. These questions referred to fields of experience that patients after transplantation are normally concerned about (such as changes of the self and body image, the perception of the transplanted lung and the medication, or the relationship with the supporting social network). The questions in the semi-standardized interviews were as follows.

### *Questions on patient's self image*

1. How would you describe yourself? Please describe yourself as you've seen yourself recently.
2. Have you changed as a person since the transplant? In what way?
3. Do you see yourself as more active or more passive since the transplant – in terms of your job, leisure time, or in general as a member of society, for instance?

### *Questions on patient's health*

4. How would you describe your body today – that is, after the lung transplant?
5. What has happened to the lung in your body since the transplant took place? How would you describe the lung in general? What feelings do you experience towards the lung?
6. Please describe how the medication you take works in your body. What feelings do you experience towards the medication?

### *Questions on patient's social network*

7. I'd be interested to know which people are important for you at present.
8. How would you describe these people? Please choose the three people who are the most important for you at present.
9. What feelings connect you to these people? (*If medical caregivers are not mentioned*): What do you think of your medical caregivers, in other words, the doctors or care staff at the University Hospital?

Both interviewers (Lutz Goetzmann, Erhard Grieder) are psychiatrists or psychologists with training in psychoanalysis, and experiences in counseling as well as in psychotherapy with transplantation patients, especially with lung recipients. The qualitative data analysis was conducted by Esther Vetsch and Karin S. Moser, both psychologists with a broad experience in qualitative research. Richard Klaghofer (statistician) was responsible for the quantitative data analysis. Rahel Naef (transplantation coordinator) had organized the contact with the lung recipients. Annette Boehler leads the Lung Transplant Program, Erich W. Russi is the head of the Department of Pulmonary Medicine, and Claus Buddeberg is the head of the Department of Psychosocial Medicine at the University Hospital Zurich. Claus Buddeberg was responsible for this psychosocial research project.

### **Metaphor Analysis**

Metaphor analysis took place with the aid of the Atlas/ti (Version 5) software program for analysis of textual data (Scientific Software Development, 2006). Five main categories ("self," "body," "lung," "medications," and "social network") according to the interview manual, as well as a residual category "other themes," were defined. These categories have been deductively developed and pre-set as filtering categories introduced before the interviews. The category "social network" included categories referring to significant people mentioned in the interview (e.g., partner or medical staff; nurses, physicians). The category "other themes" included statements which did not refer to the issues of the study. Using this coding scheme, every passage of transcribed interview texts was coded within a main category or with the residual category "other themes."

In a second step, all metaphorical expressions were identified in the entire text corpus, and then coded into metaphor categories. The criterion for the identification of a metaphorical expression was that the mapping process of projecting a source domain (e.g., battle) onto a target domain (e.g., drugs) had to be recognizable. In a further step, the metaphor source domain behind the analogy (metaphorical schema) used in each metaphorical expression was identified.

For example, if the metaphorical expression "drugs are little bombs" was used, the metaphorical expression was identified as part of the metaphorical schema "MEDICAL TREATMENT IS WAR," and ascribed to the source domain "battle." Using this same procedure, all metaphorical expressions were coded into categories of source domains such as "battle," "acoustics," "nature," and so on. To name the metaphor categories definitely, we used the terms and definitions of an earlier study on "metaphors of the self" with a sample of university graduates (Moser, 2003). The coding of the first

three interviews showed that these terms were suitable for the present study; there were no additional metaphor categories found. All anchor examples, however, were taken from the interviews of the present study.

The distinction of literal expressions from metaphorical expressions is not always clear and depends very much on context. We tried to overcome the problem by explicitly defining the coding rules for metaphor categories and using inter-rater measures (see paragraph “statistical analysis”) to ensure reliability of metaphor coding. Sometimes a person used multiple metaphors in one metaphorical statement (i.e., the metaphor was based on several source domains). In this case, we coded the predominant source domain.

In the following, the definition of the metaphor source domain “container” and the according anchor example are shown.

The definition for “container” was: All metaphorical statements based on the model of a container. The central attributes are the division into exterior and inner space, walls/separations, floor, ceiling, roof, openings such as entries and exits, windows and doors; but also the state of fullness vs. emptiness, the processes of being full and being filled or emptied respectively. Further related processes are to open/close, to put up/pull down, and to put in/take out something. Included are all metaphorical statements that conceptualize the body as a container.

The anchor example for “container” was: “For me, the lung is not perceptible. It is as if the body is a hollow space.”

## **Statistical Analysis**

The interview text data (e.g., frequencies of the individual metaphor categories) collected with the help of the Atlas/ti software programme were exported to the SPSS software programme for further statistical evaluation. The quantitative data analysis was undertaken with SPSS 11.0 statistical software program. The descriptive data were represented in absolute frequency and percentages (metaphor categories) as well as in mean values and standard deviations (NEO-FFI). To compare the mean values in the NEP-FFI with the test norms, we used the one-sample t-test. Correlations between the frequency of metaphors and the NEO-FFI values were calculated with the Pearson correlation coefficient. As the individual interviews indicated a varied frequency of metaphors, the metaphor frequency for the correlation calculations was standardized.

To insure independence and salience of metaphor categories, inter-rater reliability was measured by two independent raters. Interrater-reliability was calculated first by the concordance index R for single categories, and secondly by the Cohen’s Kappa over all categories; this index considers supplementary the concordance that is caused by chance. This procedure as well as the previous continuous discussions in our research group about identifying metaphorical speech and coding metaphorical statements was introduced to ensure trustworthiness in our qualitative study.

## Results

### Socio-Demographic and Medical Data

Table 1 shows the socio-demographic data and the diagnosis of the underlying lung diseases.

Table 1

*Sociodemographic Data and Diagnosis of the Underlying Lung Diseases (n =20)*

Sociodemographic Data		Diagnosis of the underlying lung diseases	
Men	10 (50%)	CF <sup>3</sup>	5 (25%)
Women	10 (50%)	COPD <sup>4</sup>	3 (15 %)
Age (Years)	41 <sup>1</sup> (18-60)	Pulmonary Hypertension	3 (15%)
Time since Tx <sup>2</sup> (Years)	3.9 (1.8-9.0)	Pulmonary Fibrosis	2 (10%)
Marital Status (Partnership)	13 (65%)	Other Lung Diseases <sup>5</sup>	7 (35%)
Working more than half time	2 (10%)		

<sup>1</sup> Mean average

<sup>2</sup> Transplantation

<sup>3</sup> Cystic Fibrosis

<sup>4</sup> Chronic Obstructive Pulmonary Disease

<sup>5</sup> Lymphangioliomymatosis, Bronchiolitis obliterans, Histiocytosis X, and Bronchiectasis

*Mean values and standard deviations of the personality factors (NEO-FFI)*

Table 2 shows mean values and standard deviations for the 5 personality factors (n=20), as well as the mean values and standard deviations of a community normal sample (Borkenau & Ostendorf, 1991), as well as statistical differences between study sample and community normal sample.

Table 2

*Mean Values (M) and Standard Deviations (SD) for the Five Personality Factors (n=20), Additionally Showing the Mean Values of a Community Normal Sample (Borkenau & Ostendorf, 1991) (n=1908) as well as Statistical Differences between Study Sample and Community Normal Sample*

Variable	M	SD	Minimum	Maximum	M community normal sample <sup>1</sup>	p <sup>2</sup>
Neuroticism	1.63	.81	.33	3.67	1.62 <sup>1</sup>	.97
Extraversion	2.42	.52	.92	3.25	2.20 <sup>1</sup>	.08
Openness to experiences	2.58	.51	1.83	3.75	2.04 <sup>1</sup>	< .001
Agreeableness	2.54	.36	1.67	3.33	2.54 <sup>1</sup>	.99
Conscientiousness	2.74	.44	1.67	3.54	2.71 <sup>1</sup>	.74

<sup>1</sup> Mean values of a community normal sample (n=1908)

<sup>2</sup> Differences between study sample and community normal sample (Borkenau & Ostendorf, 1991)

As the results show, the study patients report significantly higher values of the personality factor “openness to experience” than the persons of the community normal sample. The values of “neuroticism,” “extraversion,” “agreeableness,” and “conscientiousness” are comparable to the community normal sample.

*Quantitative results: Interrater-Reliability, metaphor analysis, and correlations between metaphor-categories and the 5 personality factors*

Table 3 shows the interrater-reliability (concordance index R), the frequency of metaphor categories, and the correlations between the metaphor-categories and the five NEO-FFI personality factors, after standardization of word frequency (n=20).



Table 3

*Interrater-Reliability (concordance index R), Frequency of Metaphor Categories, and Correlations between the Categories and the Five NEO-FFI Personality Factors, After Standardization of Word Frequency (n=20)*

Metaphor category	R	Frequency of categories n	%	Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness
Container	0.9	271	18.8	-.099	.114	.582**	-.246	.036
Closeness/ distance	0.9	130	9.0	-.299	-.001	-.064	-.306	-.182
Weight/ balance	0.9	124	8.6	-.234	.107	.258	.106	.049
Technology	0.9	118	8.2	.061	.072	.135	.086	-.008
Body	0.8	115	8.0	.298	-.131	-.057	-.026	-.457
Path	0.9	108	7.5	-.211	.338	.278	-.363	.054
Battle	0.9	90	6.2	-.060	-.045	.596**	-.274	-.242
Up/down	1.0	69	4.8	-.287	-.038	-.010	.348	.243
Economy	1.0	59	4.1	-.150	.478*	.294	.355	.319
Attachment	0.9	48	3.3	.102	-.146	.244	-.115	-.368
Nature	1.0	48	3.3	-.020	.153	-.178	.215	.019
Tactile	1.0	41	2.8	.118	.228	.354	-.264	-.128
Circle	0.9	34	2.4	.075	.307	.097	-.223	.240
Play/sport	0.8	30	2.1	-.001	.661**	.395	.077	.260
Visual	1.0	29	2.0	.086	.316	.334	-.304	-.080
In front / behind	1.0	29	2.0	.142	.307	.542*	.031	-.121

Part/whole	1.0	28	1.9	.250	-.072	-.053	-.273	-.275
Further metaphors	1.0	24	1.7	-.420	.498	.115	.126	.401
Art	0.7	15	1.0	.173	.089	.198	.046	-.364
Illness	1.0	14	1.0	.041	-.151	.496*	-.403	-.450*
Acoustic	1.0	12	0.8	-.331	.575**	.532*	-.065	.210
Law	1.0	9	0.6	-.089	-.041	.048	-.110	-.351
Total frequency of metaphors		1445	100	-.090	.190	.598**	-.137	.000
Total frequency of words		151437	100	-.221	.505*	.099	.440	.121

\*\* Correlation is significant at the .01 level (2-tailed).

\* Correlation is significant at the .05 level (2-tailed).

The concordance index R for the single categories is shown in Table 3. Additionally, the concordance index Kappa (Cohen's kappa) was K=0.7 (circle, path), K=0.8 (body, illness, nature, container, attachment, closeness/distance), K=0.9 (battle, art, law, play/sport, technology, economy, container, weight-balance) and K=1.0 (up/down, in front/behind, acoustic, tactile and visual). Kappa values > 0.7 indicate a good interrater-reliability (Bortz & Döring, 1995).

As Table 3 further indicates, the most frequent are the "container" categories (18.8%), followed by "closeness-distance" (9.0%), "weight/balance" (8.6%), "technique" (8.2%) and "body" (8.0%). More than 50% of all encoding concurred with these metaphor-categories.

With respect to the correlations between the personality factors and the metaphorical categories, "extraversion" shows a highly significant positive correlation with the categories of "acoustics" and "play/sport," and a significant positive correlation with "economy." "Openness to experience" positively correlates to a highly significant degree with "container" and "battle," as well as significantly positive with "acoustics," "illness," and the implicit spatial perception of "in front/behind." "Conscientiousness" correlates significantly negatively with the category "illness." "Openness to experience" shows a highly significant positive correlation with the number of metaphors used in the interview. "Extraversion" shows a significantly positive correlation with the number of words used during the interview. No significant correlations were found concerning the personality factors "neuroticism" and "agreeableness."

*Qualitative results: Metaphor analysis within the framework of the Big Five model*

In the following section metaphors are shown that patients with the highest or lowest values of the correlating personality factor have used. When a positive correlation was found between a personality factor and a metaphor category, the metaphorical statements from patients reaching the highest values for this personality factor are shown (in the case of the personality factors “extraversion” and “openness to experience”). When a negative correlation was found between a personality factor and a metaphor category, we show the metaphorical statements from patients reaching the lowest values for this personality factor (in the case of the personality factor “conscientiousness”).

*Extraversion.* Mrs. T. and Mr. K. show the highest values for “extraversion” (NEO-FFI value for extraversion: Mrs. T. 3.25; Mr. K. 3.17). “Extraversion” correlates positively with the metaphor-category “acoustics.” Mrs. T. uses an acoustic concept in order to portray conflicts with her sister. Referring to arguments about money payments, she says, “First of all there was a row, then we somehow found a solution.” Her metaphorical concept here is: RELATIONSHIP IS NOISE. Mr. K. says of his mother, “She has always harmonized her life with me” (in German: “harmonize” = “abstimmen” in a musical sense). His concept is: RELATIONSHIP IS (MUSICAL) HARMONY.

Another metaphor category that correlates with “extraversion” is “play/sport.” Mr. K. states that doctors “play a minor role.” He uses the idea of dealing out a (hierarchical) role. Referring to personal problems, Mrs. T. says, “I shall never get married then there won’t be a theatre.” She refers to that which is spectacular and dramatic. Both employ the concept of: LIFE IS A THEATRE.

“Extraversion” also correlates with the metaphor category of “economics.” When speaking of the transplant, Mr. K. says that compared to the physical advantages of the transplant, the taking of medicine is “a small price to pay.” Referring to the bodily advantages of a transplant, Mrs. T. says, “In life, you can’t have your cake and eat it.” Both of them use the concept: HEALTH HAS ITS PRICE.

*Openness to experience.* For the personality factor “openness to experience,” Mrs. E. and Mr. R. reach the highest values (3.75; 3.33). In connection with “openness to experience,” mental concepts from the domain of “acoustics” are used. Mrs. E. says that her mother “had a row with the cleaning lady” (RELATIONSHIP IS NOISE). Both patients use a multitude of metaphor source domains connected with container. Mr. R. mainly uses structures referring to an “inner space” of a container, or to the act of “taking in” or “getting into.” “I am someone who rushes into things. And then I slipped into this business” (YOU FALL INTO SITUATIONS). He speaks of the daily inhaling before the transplant. “And I just realized that the purpose of this was to fill me up for two hours every day” (I’M A CONTAINER WITH AN INNER SPACE.). Both movements (“in/out”) relating to a container are also possible for him: “And then, my anger or something let everything come out.” “It is then very difficult to distinguish between the good or bad feelings – what comes from outside and what from within” (I AM A CONTAINER FULL OF EMOTIONS).

Mrs. E. also uses source domains that relate to the “inner space” of a container or to “taking in/putting in.” Referring to herself and her partner she says, “We actually had that kind of partnership model in mind” (MY MIND IS A CONTAINER FOR MENTAL CONTENTS). Coming from the source domain relating to restrictions or limitations of a

container Mrs. E. says, “I’m really limited with the lung.” These restrictions mostly refer to a limited state of health.

A further metaphor category correlating with “openness to experience” is that of “battle.” Mr. R. describes that his mother had “set him against” his (sometimes violent) father, who “tried to escape from emotional problems.” Mrs. E. uses the source domain “battle” when she is talking about a certain doctor: “Well I must defend Dr F. a little there.” Later on she says that the transplant gave her the “feeling that I am somehow unassailable.” The underlying basis of these examples is the implicit concept RELATIONSHIP IS WAR.

Both patients also used the metaphor source domain relating to the spatial conception of “in front/behind.” Speaking about her family and the people that are the most important to her, Mrs. E says, “Well, I would say in the first place, husband and children.” This concept would be “important things are in the foreground”.

Metaphor categories related to “illness” also correlate significantly with “openness to experience.” Mr. R. says, “I’m very vulnerable to certain things” (I’M VULNERABLE) or “There are things that I’m just allergic to” (CERTAIN THINGS DON’T AGREE WITH ME). Mrs. E. uses another aspect of being ill, namely that of needing care and attention. When speaking about the donor of her lung transplant she refers to a beautiful image that she has in her mind and “you can give this image some special care” (I NEED CARE). Possibly “openness to experiences” goes along with the implicit conception that openness also has a combative, aggressive note that brings vulnerability with it.

*Conscientiousness.* Interview participants with high level of conscientiousness use fewer metaphors for “illness.” The two patients with the lowest values for conscientiousness, Mr. R (1.67) and Mr. J (2.33) use illness metaphors especially to express their vulnerability (e.g., “I’m very vulnerable to certain things”).

## Discussion

The idea of the present study was to investigate the association between the Big Five personality factors and metaphorical schemas, based on the theoretical framework of cognitive personality theory. The results indicate that personality factors correspond with certain implicit metaphorical schemas and that metaphor analysis might be an appropriate scientific tool to investigate cognitive schemas related to personality traits. The differences of the NEO-FFI values (“openness to experiences”) between our sample and a community normal sample could be explained by suggesting that transplantation patients need more openness to new experiences (such as living with a transplanted lung) to cope with the psychological demands of an organ transplantation.

Regarding the different correlations between personality factors and the use of metaphors, the results of our study show that extroverted people use conceptual metaphors related to sound or noise (RELATIONSHIP IS HARMONY; RELATIONSHIP IS NOISE). Drawing attention to oneself through sound is probably a basic attribute of extraversion. In accordance with this result, extroverted people also show the greatest word frequency. Gifford and O’Connor (1987) showed the correlation between word frequency and the interpersonal disposition of extraversion. Here is some empirical evidence that personality is encoded in verbal behavior. Similarly, concerning

the outward turning (revealing oneself) or making oneself audible, extroverted persons, in conceptions of (artistic) play, think in terms of the mental concept, LIFE IS A THEATRE.

The present empirical conclusion that significant correlation between “openness to experience” and the frequency of using of metaphors goes along with Johnson’s idea (1987) that metaphorical thinking assists understanding and mental processing of new experiences.

“Openness to experiences” is also associated with implicit conceptions, originating from the field of acoustics (e.g., within the concept of RELATIONSHIP IS NOISE). This tendency to employ acoustic metaphors could be a way to make oneself audible or to exceed an acoustic limit. Then again, “openness to experience” correlates with the metaphor source domain related to the mental model of a container. Generally, this metaphor is based on the experience of one’s own body as a container (Johnson, 1987). In the present study the metaphorical model of a container frequently relates to the “inner space,” especially to a “coming in” in the sense of ONE GETS INTO SITUATIONS. This “getting into” possibly concerns a gain in new experiences. However, this openness must not necessarily be viewed as positive. It can be conceived as a war involving an aggressive note, in which one is injured or confronted with experiences that are undesirable. People exposing themselves to new experiences need to have an aggressive potential in their perception, but also to face the implicit risk of an injury. This shows itself, for instance, in the illness metaphor of allergy, which can be understood as a counter regulation of openness to experience. These aspects connected to risks are expressed in the mental conceptions of RELATIONSHIP IS WAR, CERTAIN THINGS DO NOT AGREE WITH ME, I’M VULNERABLE, or I NEED CARE. In conclusion, it can be said that people with openness to experience implicitly involve themselves with sounds, noise, and music, but also in making themselves audible, getting into things, aggressive encounters, and vulnerability. The exclusively negative correlation between “conscientiousness” and “illness” or “vulnerability” appears to show that especially conscientious people feel less vulnerable. The patients with low conscientious values, on the other hand, did tend to use illness metaphors that described their personal vulnerability.

There are the two personality factors, “neuroticism” and “agreeableness,” which did not correlate with any metaphor category. One must consider that although the Big Five model concerns a construct that is well validated, it is being further developed. There is the possibility of personality factors with a different or more differentiated definition of “neuroticism” or “agreeableness” being discovered in the future (Saucier & Goldberg, 1998).

Our findings can be seen within the theoretical framework of implicit (unconscious) and explicit (conscious) cognitive schemas. According to Beck et al. (2004), long-standing cognitive-affective-motivational “programs” develop from the interaction between genetically determined structures and psychological experiences. These programs influence the way we construe events, what we feel, and how we are disposed to act. We suggested that these programs consist of multimodal schema-structures with sub-symbolic (e.g., emotional) and symbolic (e.g., visual, verbal) qualities (see Bucci, 1997). From this point of view, metaphoric schemas are highly developed cognitive, symbolic structures that are particularly suitable for processing new

experiences coming from the sub-symbolic systems. The findings of our study show that these metaphorical schemas are associated with personality factors. We conclude that personality, to a certain degree, could be based on implicit metaphorical schemas or metaphorical thinking. The style of metaphoric thinking seems to influence the individual type of cognitive as well as emotional information-processing.

In cognitive linguistics as well as in psychoanalytic theory, metaphorical schemas are predominantly implicit mental structures, such as the indirect expression of unconscious fantasies (Arlow, 1979) or of repressed psycho-physiological experiences (Sharpe, 1950). Borbely (1998) distinguishes the metaphorical process from the primary, as well as from the secondary process of thinking. Same as the so-called primary process (i.e., the unconscious way of thinking), metaphorical thinking involves metonymy, synecdoche, and condensation, and like the secondary process (i.e., the conscious way of thinking), it is orientated towards the reality principle. This psychoanalytical idea means that metaphorical thinking uses strategies of the unconscious primary process to build up metaphors, but the person using metaphors knows something (but not all) about the psychological roots or sources of these linguistic phenomena. Thus, in our example, the patient who speaks about drugs as “little bombs” knows firstly that drugs are not bombs, and secondly, that he/she is experiencing drugs as destructive objects. On the other hand, he/she might not be aware that he/she is experiencing drugs like an unconscious aggressive introject (i.e., like a person that was unconsciously internalized in her childhood). Similar to the implicit quality of metaphoric concepts assumed by cognitive linguists (Lakoff & Johnson, 1980), metaphorical thinking is situated as a kind of “imaginative rationality” between the primary and the secondary process of thinking.

In our study, for example, extraverted persons think in terms of the implicit and metaphorical implicit schemas RELATIONSHIP IS NOISE and LIFE IS A THEATRE. Consequently, these individuals might experience life sometimes as an opera or play. On the stage of theatre, they are able to show themselves and form their relationships in an open, audible way, and everybody is allowed to hear and see them. From a psychodynamic point of view, extraverted persons may have the implicit experience or desire to be admirable and charming individuals, and this experience/desire is represented by metaphorical schemas. In this sense, metaphorical schemas seem to be implicit cognitive aspects of personality.

The results of the study show the creative potential to understand the metaphorical concepts of transplantation patients. However, there are some limitations to the present study. Firstly, the sample size of 20 individuals is small. Secondly, the correlations between personality factors and metaphor source domains may be not particularly typical for lung transplant patients, but also applicable to the general population. Studies with larger samples and healthy participants should verify our results. Further, the findings of this cross-over study can show only that personality is associated with the metaphorical construction of the internal and external world. Future longitudinal studies assessing the development of language as well as of personality may explain if implicit metaphorical schemas actually determine personality. This research may indicate how far the investigation of metaphorical and implicit concepts that underlie personality can contribute to the further development of personality psychology by means of metaphor analysis.

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