lin nicht-kompetitiv hemmt. In Gegenwart von niedrigen (unwirksamen?) Noradrenalin-Konzentrationen wirkt es dagegen lipolytisch. Es darf angenommen werden, daß sich die übrigen Thymoleptica ebenso verhalten.

Die mitgeteilten Befunde bestätigen die scheinbar widerspruchsvollen Angaben im Schrifttum. Die tricyclischen Antidepressiva hemmen tatsächlich die durch Noradrenalin gesteigerte Lipolyse in vitro und unter gewissen Bedingungen wohl auch in vivo, wie dies von Finger u. Page am Beispiel von Desipramin gezeigt worden ist. In Gegenwart von sehr niedrigen (physiologischen?) Noradrenalin-Konzentrationen entfalten sie aber eine schwache lipolytische Eigenwirkung. Der bei orientierenden Versuchen in vivo nach Verabreichung von Desipramin und verwandten Substanzen auch bei nüchternen Individuen beobachtete Konzentrationsanstieg der nichtveresterten Fettsäuren im Blutplasma kann also auch ohne die Annahme von zentralen Mechanismen erklärt werden.

In bezug auf den Mechanismus der Wirkung der Thymoleptica auf die Lipolyse sind nur Mutmaßungen möglich. Noradrenalin und andere Catechinamine wirken lipolytisch, indem sie die Bildung von cyclischem Adenosinmonophosphat fördern, das seinerseits die sog. hormonsensitive Lipase aktiviert. Möglicherweise besetzen die Thymoleptica bei vorhandener, wenn auch schwacher lipolytischer Eigenwirkung die adrenoceptiven Strukturen der Adenylcyclase an der Zelloberfläche, so daß später hinzukommendes Noradrenalin nicht mehr wirken kann (kompetitiver Agonismus). Bei Versuchen in vitro muß aber noch eine andere Möglichkeit in Betracht gezogen werden, nämlich die, daß der Eintritt des schlecht schrankengängigen Noradrenalins aus der Inkubationsflüssigkeit in das Fettgewebe durch die Thymoleptica und durch Cocain behindert wird, die den Noradrenalin-Transport auch an anderen Stellen hemmen. Zur Klärung des Wirkungsmechanismus sind weitere Untersuchungen notwendig.

Zusammenfassung

Es wird über den Einfluß von Nortriptylin, Protriptylin, Imipramin, Melitracen, Desipramin, Clomipramin, Amitriptylin, Dibenzepin und Cocain auf die Fettmobilisierung in vitro berichtet. Alle genannten Substanzen hemmen konzentrationsabhängig die durch Noradrenalin gesteigerte Freisetzung von Fettsäuren in isoliertem Fettgewebe von Ratten; ihre inhibitorische Wirkungsstärke nimmt in der o.g. Reihenfolge ab. In Gegenwart von sehr niedrigen Noradrenalin-Konzentrationen ist dagegen eine lipolytische Eigenwirkung zu beobachten; auch die Spontanlipolyse wird z. B. durch Desipramin deutlich gefördert.

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Summary

Thymoleptic Drugs and Lipolysis

The effects of nortriptyline, protriptyline, imipramine, melitracene, desipramine, clomipramine, amitriptyline, dibenzepine, and cocaine on fat-mobilization were studied *in vitro* using standard techniques. All substances inhibited the norepinephrine-induced release of free fatty acids (FFA) in isolated rat adipose tissue, their inhibitory activity decreasing in the above-named sequence. However, in the presence of very low (inactive?) concentrations of norepinephrine protriptyline clearly enhanced the liberation of fatty acids, and the rate of spontaneous lipolysis was doubled by desipramine-concentrations which caused a 50%-inhibition of the catecholamine-stimulated fat-mobilization.

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Unity and Covariance of Perception and Behavior

Perceptual Variability: a Predictor of Psychotomimetic Drug-induced Behavior

By Roland Fischer, Karen Thatcher, Thomas Kappeler, and Phillip Wisecup

The magnitude of the variance on taste thresholds [1] and spatial distortion thresholds [2, 3] in a group of 15 college-age volunteers was recently reported to be a predictor of behavioral change induced by 3-(2-dimethylaminoethyl)-indol-4-yl dihydrogen phosphate (psilocybine) as measured in terms of psychopathology by the Minnesota Multiphasic Personality Inventory (MMPI) [1] and/or the Goldberg formula scores which discriminate along a neurotic-psychotic continuum [2]. Confirming and extending the above findings in 16 other self-selected college-age volunteers — 10 males and 6 females — with a median age of 23.1 years, we report here that the magnitude of the standard deviation on such a simple "perceptual" parameter as handwriting area (SDHA) can also be a predictor of behavioral change induced by 160 μg/kg psilocybine regardless whether that change is expressed, as it has been, in terms of psychopathology, or in terms of non-pathological personality dimensions measured either with a card form of the Myers-Briggs Type Indicator (MBTI) [4] — a brief, self-reporting inventory based on Jungian typology — or with the Personal Orientation Inventory (POI) which is based on Maslow's ideas and measures self-actualization [5].

Each handwriting test consists of copying 4 times with a medium point fountain pen a 28-word text on separate sheets of 8½ by 11 inch, unlined 20 pound bond paper fastened to a clipboard. The first sheet, of subjects who have never taken the test before, is discarded prior to collecting the 4 samples. Whenever possible, the task should be repeated on 2 or 3 occasions depending on the subject's variability, the mean of the means is then computed.

The following information is for the benefit of those who intend to duplicate our results: all of our samples were obtained on paper fastened not to an ordinary clipboard but to one with a built-in handwriting pressure indicator which operates on a pressure-to-voltage-to-frequency basis and is equipped with a (Daytronic) pressure transducer and a (Hewlett-Packard) voltage-to-frequency converter (to be published by R. Fischer, T. Kappeler, and P. Wisecup). To selectively record the pressure of only the pen, the subject's hand glides on a movable plate or handrest, not connected with the transducer which somewhat limits the size of the standard deviation (S.D.). Therefore, we expect that the total range of the standard deviation handwriting area (SDHA) will be larger under free-hand conditions.

We also find that the SDHA at T_1, *i.e.* the magnitude of the standard deviation on handwriting area without drugs, is for a particular day a predictor of the accuracy with which a subject can estimate at drug peak (T_2) a 65-min time span and a 120-inch length in geometrically ascending intervals of 1, 2, 4, 8 *etc.* min and inches respectively.

Our group of predominantly taste sensitive and thus intuitive volunteers [1, 6] was familiarized with the psychodysleptic experience weeks prior to experimentation through a 10 mg psilocybine dose.

Each subject's retest variability on the MBTI was determined within a two week interval followed by a three day experimentation period during which a card form of the MBTI was administered to each subject (T_1, Friday), then 70 min after the oral administration of 160 µg/kg of psilocybine (T_2, Saturday), and under post drug conditions (T_3, Sunday). The "ideal self"-MBTI at T_2 and T_3 was administered within a 48 h period three weeks later. Each time, a sign is placed in front of the subject while he sorts the cards of the MBTI test questions: "It is not you but your ideal self which answers the questions." It should be mentioned that at T_2, completing the MBTI takes approximately one-half hour while the "ideal self"-MBTI takes from one-half to two hours.

Table 1 summarizes our newly obtained data, with the second and third columns showing the connection between previous and present experimentation. There is a positive correlation between the new perceptual variability parameter, *i.e.*, the magnitude of the SDHA and the previous taste threshold retest variance. The Pearson Product Moment Correlation coefficient, $r = 0.88$, $p < 0.05$. (All correlations in this paper are Pearson Product Moment Correlations.) It can also be seen in column 2 that the SDHA in females displays a wider range of variability than that of men, with the largest value in females exceeding by 60% the largest male value. Further results: a positive correlation between the magnitude of the SDHA at T_1 and the extent of the drug-induced behavioral change at T_2 expressed as the difference between MBTI scores T_1 and T_2 (column 4); a positive correlation of the behavioral change for males expressed as proceeding along the Extraversion-Introversion continuum of the MBTI, implying that men become more "extravert" at T_2 (column 5); a negative correlation if the behavioral change for females is expressed along the Feeling-Thinking continuum of the MBTI, implying that "feeling" in women becomes more predominant at T_2 (column 6); and finally a negative correlation between the SDHA at T_1 and the difference score obtained when deducting the total score of the "ideal self" MBTI at T_2 from that of the regular MBTI under post-drug conditions (T_3). The respective correlations between columns 2 and 4, 2 and 5, 2 and 6, as well as 2 and 7 are: $r = 0.494$, $p < 0.05$; $r = 0.74$, $p < 0.05$; $r = -0.75$, $p < 0.05$; and $r = -0.454$. $p < 0.05$.

The correlations are not impressive but more than suggestive, especially in light of our previously obtained and comparable data [1, 2, 3]. The reason that the correlations do not reach particularly high levels of significance is the 24 h to 3 week lapse between the measurement of an SDHA and the completed perceptual and behavioral tests. Evidence which has accumulated since the computation of these data shows that the magnitude of the SDHA at T_1 is an accurate and reliable predictor of a subject's drug-induced perceptual-behavioral performance at T_2, providing that the performance falls within the same day as the measurement of the SDHA. In recent experiments, we measure the SDHA at T_1 usually at 10 to 10:30 a.m., just a few minutes before the drug administration (0 time) which is followed 90—110 min later, *i.e.* at drug peak, by a type of perceptual or behavioral test which takes from 5 to 60 min but no longer*).

The last correlation implies that the smaller the size of the SDHA, the smaller the discrepancy between the "ideal self" and the "self", a relation further specified in Table 2, column 3, through a significant negative correlation ($r = -0.624$) between the size of this discrepancy and what we call "experienced creativity". The latter is measured in terms of the sum of the scores of the intuition (N) and perception (P) scales of the MBTI, a procedure based on MacKinnon's data which show that highly creative architects, writers and scientists consistently score high on these two scales [7, 8]. The next significant negative correlation in Table 2, column 4 ($r = -0.620$) reveals that the smaller the discrepancy between the "ideal self" and the "self", the higher the subject's total score on the POI in terms of self-actualization. The last two correlations in the fifth column of Table 2 again refer to the "consistency" of a subject by showing that retest variability on the MBTI, as well as the magnitude of the difference between "ideal self" (T_2) and "self" (T_3), are positively related to a subject's ability to estimate accurately the 65-min time span at T_1.

Our subjects were also able to reproduce the known phenomenon of time contraction, or chronosystole, at T_2; *i.e.*, the compression of experienced time into a smaller chronological interval [9, 10]. Interestingly, the smaller the SDHA of a subject at T_1, the less pronounced is not only his experience of time contraction during the estimation of geometrically ascending series of intervals totaling 65 min, but also the less pronounced is his experience of length contraction at T_2 during the estimation of intervals totalling 120 inches. Length-estimations, which have never been reported before,

*) Under these conditions *e.g.* the size of the SDHA is 1. positively correlated with self chosen tapping rate/sec, a 4 min test, at T_1 ($N = 17$, $r = 0.604$, $p < 0.01$), and 2. negatively correlated with the duration of a 65 min time estimation task at T_2 ($N = 11$, $r = -0.740$; $p < 0.01$) *etc.*

Table 1: Illustration in 10 male and 6 female volunteers of the relation between "perceptual" variability, *i.e.*, standard deviation on handwriting area (SDHA) and taste threshold retest variance (for 5 males and 5 females only) without dugs (T_1) (columns 2 and 3) and psilocybine-induced behavioral change (T_2) as measured with the Myers-Briggs Type indicator (MBTI) in terms of change in total score (T_2—T_1) (column 4); change for males along the Extraversion-Introversion dimension (column 5); change along the Feeling-Thinking dimension for females (column 6); and as difference score between post-drug MBTI (T_3) and MBTI (T_2) under "ideal self" conditions.

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Initials and sex of volunteers (N = 16)	S.D. of handwriting area (SDHA) in cm²	Quinine taste threshold retest variance in Mol.	MBTI total score T_2—T_1	MBTI scales E÷I ♂ T_2—T_1	MBTI scales F÷T ♀ T_2—T_1	MBTI (T_3) minus "ideal self"-MBTI (T_2) (total score)
Males						
1. D. D.	9.57 (2)*)	1.1716×10^{-6}	104	—30		70
2. J. S.	7.66 (2)	4.6880×10^{-6}	160	— 8		48
3. A. P.	6.99 (1)	2.5638×10^{-6}	36	—16		20
4. E. P.	6.51 (2)		30	2		30
5. L. C.	5.23 (2)		60	10		42
6. G. M.	4.58 (2)		32	— 8		12
7. B. J.	4.33 (2)		22	2		10
8. S. S.	3.72 (1)		20	4		2
9. S. H.	3.67 (2)		20	— 2		20
10. J. G.	3.06 (2)		12	0		46
Females						
11. E. A.	14.54 (3)	32.8120×10^{-6}	74		—32	2
12. J. H.	11.01 (2)	10.5486×10^{-6}	50		—30	46
13. Y. F.	7.98 (2)		80		—28	18
14. M. W.	6.50 (2)	4.6880×10^{-6}	28		20	47
15. J. Haw.	4.65 (2)		14		0	14
16. S. P.	2.01 (1)		20		4	30

*) Indicates number of handwriting tests from which the mean SDHA has been computed.

Table 2: Further specification of drug-induced behavioral change in terms of "experienced creativity" and self-actualization, as well as in relation to perceptual-behavioral parameters. For details see paragraph 5.

	Pearson product moment correlations (r)				
	Column 1	Column 2	Column 3	Column 4	Column 5
	MBTI (total score) T_2-T_1	MBTI-MacKinnon creativity T_1 ($\Sigma N+P$ scales)	MBTI (T_3) minus "Ideal self"-MBTI (T_2) (total score)	P.O.I. (total score)	63 min Time Estimation T_1
MBTI retest variability T_1-T_0	0.254	−0.281	−0.060	−0.261	0.490*) (n = 14)
MBTI (total score) T_2-T_1		−0.120	−0.281	0.284	−0.023
MBTI-MacKinnon creativity T_1 ($\Sigma N+P$ scales)			−0.624**) (n = 16)	0.344	0.090
MBTI (T_3) minus "ideal self"-MBTI (T_2) (total score)				−0.620**) (n = 16)	0.503*) (n = 14)
P.O.I. (total score)					−0.213

*) $p < 0.05$ 1-tailed test; **) $p < 0.01$ 1-tailed test.

Table 3: Demonstration in 4 male and 3 female volunteers of the relation between the magnitude of the standard deviation on handwriting area without drugs (T_1) and estimated magnitude of length during a 160 µg kg psilocybine-induced experience (T_2). The estimations were performed in geometrically ascending intervals of 1, 2, 4, 8, 16, 32 and 64 inches.

Initials of volunteers N = 7	S. D. at T_1 of handwriting area in cm²	Estimation of 120 inches length at T_2	S. D. of four tests
Males			
1. D. D.	9.6	69.4	2.2
2. E. P.	6.5	89.6	3.7
3. G. M.	4.6	99.5	3.0
4. W. K.	3.4	123.5	2.4
Females			
1. E. A.	14.5	100.9	5.1
2. Y. F.	8.0	119.8	2.8
3. M. W.	6.5	133.6	2.7

were performed blindfolded using a specially constructed sliding indicator along a measuring rod (see Table 3). In two groups of subjects — 4 males and 3 females — there is a positive correlation between decreasing SDHA at T_1 and a less pronounced length contraction at T_2: $r = 0.962$, $p < 0.01$ for males, and $r = 0.990$, $p < 0.01$ for females.

There is another interesting phenomenon related to our finding that the larger the SDHA of a subject at T_1, the more pronounced is his experience of drug-induced time contraction at T_2. We observe that the most pronounced experience of time contraction at T_2 is followed by the most pronounced experience of time expansion 24 h later. Fig. 1 illustrates this rebound phenomenon in which 63 min of chronological time are first contracted into an experience estimated as lasting only for 13.9 min as measured between the third and fourth hours after the ingestion of 160 µg/kg psilocybine — and then 24 h later expanded to a 140 min time experience. This rebound, in turn, is followed 48 h after the drug administration by a return to a time estimation of 36.6 min, which is within the usual range for this particular female subject (E.A.) who displays the largest SDHA at T_1 among female volunteers.

A few words should be said about the magnitude of the standard deviation on a perceptual task in relation to the stability and predictability of the subject's perceptual-behavioral or interpretive repertoire. With subjects who display either very small or very large standard deviations on spatial distortion thresholds, it was demonstrated earlier [11] that "stability" or "variability" are characteristic personality invariants observable not only without any drug but also during a psilocybine-induced experience and even during a hypnotically induced psychodysleptic drug experience. Moreover, it could be shown [12] that "stable" subjects, *i.e.*, those with small standard deviations on perceptual tasks are "maximizers", *i.e.* they want to maintain a steady state between input and output by increasing sensory input at T_2, whereas "variable" subjects, *i.e.*, those with large standard deviations on perceptual tasks are "minimizers", or in other terms, they want to decrease sensory input at T_2. This minimizing characteristic fits in with and may in part account for the "variability" of a particular subject in perception-behavior since one cannot expect "stable" performance from a subject who has to endure more sensory input than is comfortable for him.

Time has been reported by some authors to "fly" at T_2 and by others to "drag" [13, 14]. We, however, postulate that these contradictory time experiences can be reconciled and explained in terms of our data. The "minimizers", *i.e.*, the majority of subjects, prefer to decrease sensory input at T_2 — or, in other words, attempt to optimize by decreasing sensory data content and rate of data processing — and, therefore, "contract", *i.e.*, over-estimate time and length (arriving early for appointments). "Maximizers" on the other hand, intend to optimize by increasing sensory data input and flux, and therefore "expand", *i.e.*, under-estimate time and length (arriving late for appointments). Hence, biological, *i.e.*, experienced time has been justly defined as data content and rate of data processing [11].

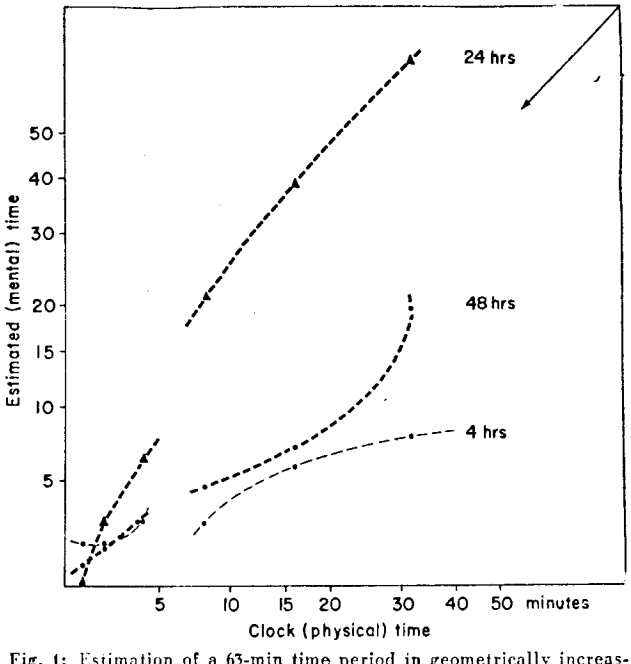

Fig. 1: Estimation of a 63-min time period in geometrically increasing intervals of 1, 2, 4, 8, 16, and 32 min by E.A., the female subject with the largest S.D. on handwriting area (see Table 1). Estimations were performed 4, 24, and 48 h after the ingestion of 160 µg/kg of psilocybine. The respective contraction, rebound-expansion, and return to the usual time estimation (for E.A.) is: 16.5, 140, and 36.6 min. Note the break in the continuity of the time estimations 4 and 24 h after the ingestion of the drug.

Can we characterize a particular "perceptual" task, the magnitude of the standard deviation of which at T_1 is a predictor of perceptual-behavioral change at T_2? An evaluation of already published dispersion data [2] obtained when measuring spatial distortion thresholds with the phorometer, base down and base up, at T_1 as well as the SDHA data just presented, allows us to conclude that apparently the less significant the correlation between dispersions and means of a variable, the better the predictive power. This is illustrated in Fig. 2 in which both the size of the SDHA, a predictor, and the size of the standard deviation on the cumulative handwriting pressure or force, which is not a predictor, are plotted against their respective means in the form of scatter diagrams and regression lines. Apparently, the magnitudes of the standard deviations are more independent of the means, *i.e.*, they are less tightly clustered along the regression line for the handwriting area ($r = 0.496$ for a one-tailed test, $p < 0.05$ only), whereas there is a more significant correlation between standard deviations and means ($r = 0.566$ for a one-tailed test, $p < 0.01$) on the force parameter.

In the 16 subjects of this study, we have also confirmed that the psychotomimetic (or perhaps more aptly psychodysleptic) drug-induced increase in pupillary diameter which follows a strict dose-response relationship is a variable indicative of the level of autonomic arousal, but entirely unrelated to the extent of drug-induced perceptual and behavioral change [1, 2, 3], although the behavioral and perceptual variables are intercorrelated. Specifically, in the present study, we can illustrate the "dissociation" between the autonomic and the perceptual-behavioral variables by pointing to the lack of correlation between our two perceptual parameters, either the SDHA at T_1 or the drug-induced increase in handwriting area, on the one hand, and the drug-induced increase in pupillary diameter, on the other ($r = 0.234$ and -0.135 respectively). However, there is a significant correlation between pupillary diameter increase and the motor parameter, the drug-induced increase in handwriting force ($r = 0.490$, $p < 0.05$). The previous [1, 2, 3] and presently obtained data can, therefore, be construed to support the notion that perception-behavior is an inseparable phenomenon: the symbolic interpretation of central nervous system activity. As interpretive processes, perception is as inseparable from behavior as description is from explanation. Symbolic interpretation can be represented in any one or all three dimensions: in the sensory dimension as raw sensations or information; in the mental dimension as experienced meaning; and in physical space-time as voluntary motor performance, or purposeful activity. In daily language, we customarily separate perception from behavior artificially by denoting re-presentations in the sensory-mental dimensions as perception and re-presentations in physical space-time as behavior.

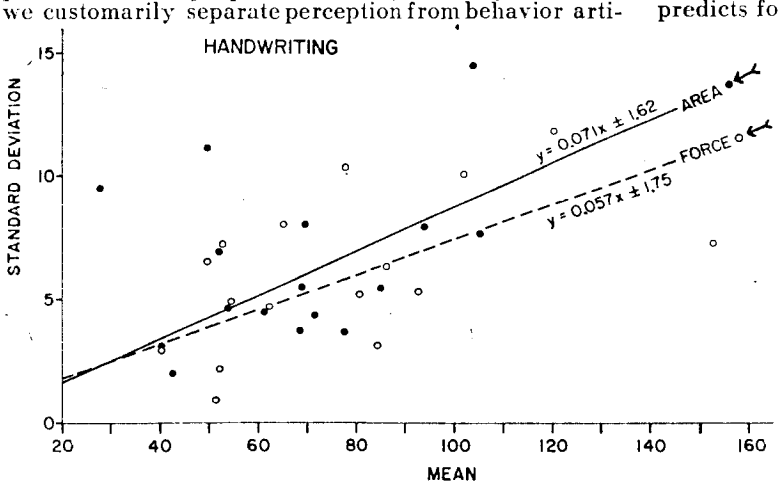

Fig. 2: Illustration of the low correlation between the S.D.'s and the means for 16 subjects on the handwriting area parameter at T_1, and the higher correlation between, that is a tighter clustering of, the S.D.'s and the means for the same subjects on the cumulative handwriting pressure or force parameter at T_1. The magnitude of the S.D. on the handwriting area is a predictor, whereas that of the force is not a predictor of drug-induced behavioral change.

The connecting hyphen between perception-behavior implies the oneness of symbolic interpretive activity, a oneness already hinted at by Thomas Aquinas: "The senses delight in things duly proportioned as in something akin to them, for the sense, too, is a kind of reason as is every cognitive power" [15]. Lindahl refers to the same unity in his paper on transitions from perceptual to conceptual learning, postulating that there is a single perceptual-conceptual dimension of functioning; [16] and Antrobus, when measuring the production of stimulus-independent thought as a function of the rate at which information is presented to human subjects, arrives at results which support a model in which both "sensory and memory events are operated on by a common central cognitive unit" [17]. The theory that perception and cognition are based on the pickup of available information and not on the experiencing of sensory data is, of course, Gibson's way of formulating the unity of perception-behavior [18]. And the most recent supporting evidence can be construed from the reported relationships between external criterion variables (perception) and clinical judgement (behavior) which apparently follow a power-function relation as we are accustomed to seeing it in sensory psycho-physics [19].

Summary

Previously it was found that the magnitude of variability on simple perceptual tasks — in gustation and vision — is significantly related to the extent of psychopathology induced by 3-(2-dimethylaminoethyl)-indol-4-yl dihydrogen phosphate (psilocybine), whereas drug-induced pupil-size increase — a reliable autonomic variable — is unrelated to drug-induced psychopathology.

In this paper, we again studied the perceptual and behavioral change induced by 160 μg/kg psilocybine in a homogeneous sample of 16 self-selected college-age volunteers. Confirming and extending earlier findings, we have found that the magnitude of the standard deviation on perceptual tasks without any drug, *i.e.* at T_1, is an indicator of a subject's perceptual and behavioral performance under psilocybine, *i.e.* at T_2. In particular, the magnitude of the standard deviation on the handwriting area (SDHA) — after copying a 28-word text 4 times — is positively correlated with behavioral change at T_2, as measured with the Myers-Briggs (Jungian) Type Indicator (MBTI) and the Personal Orientation Inventory (POI). The SDHA at T_1 also predicts for that particular day whether a subject will over- or underestimate a 65 min time span at T_2; specifically, the smaller SDHA's are correlated with the most correct time estimations whereas the larger SDHA's with increasing overestimations (time contraction) and a larger rebound effect (underestimation or time expansin) 24 h after T_2.

Stable subjects, *i.e.*, those with a small SDHA at T_1 — and thus a small variance on other perceptual and behavioral tasks at T_1 and at T_2 are defined as "maximers" because they increase sensory input at T_2; on the other hand, variable subjects, *i.e.*, those with a large SDHA at T_1 — and thus a large variance on other perceptual and behavioral tasks at both T_1 and T_2 — reduce sensory input at T_2 and hence are defined as "minimizers".

Since drug-induced perceptual and behavioral change was found to co-vary irrespective of the extent of drug-induced autonomic activity, perception-behavior is regarded as a unitary phenomenon: the symbolic interpretation of central nervous system activity.

Zusammenfassung

Einheit und Kovarianz von Wahrnehmung und Verhalten Wahrnehmungs-Variabilität: eine Voraussagemöglichkeit drogen-induzierten psychotomimetischen Verhaltens

Wir haben kürzlich berichtet, daß zwischen der Größe der Variabilität von Schwellenwert-Bestimmungen der visuellen und Geschmacks-Wahrnehmung — ohne Drogen — und dem Ausmaß der durch 3-(2-Dimethylaminoäthyl)-indol-4-yl-dihydrogen-phosphat (Psilocybin) induzierten Psychopathologie eine signifikante Beziehung besteht, während die durch die Droge induzierte Pupillenerweiterung — ein zuverlässiger Indikator autonomer Erregung — mit dem Ausmaß der durch Psilocybin induzierten Psychopathologie nicht in Beziehung gebracht werden kann.

In dieser Arbeit haben wir wiederum den Einfluß von 160 μg/kg Psilocybin auf Wahrnehmung und Verhaltensweise von 16 Freiwilligen Studenten untersucht und fanden, daß zwischen der Größe der Standardabweichung an der Handschriftfläche (SH) — erhalten nach viermaligem Kopieren eines 28 Wörter umfassenden Textes, ohne Droge — und der Veränderung der drogen-induzierten Verhaltensweise, gemessen mit dem Jung'schen Meyers-Briggs-Persönlichkeitstest und dem „Personal Orientation Inventory", eine signifikante, positive Korrelation besteht. Die Größe der SH ohne Droge ermöglicht am Versuchstag die Voraussage wie korrekt die Versuchsperson eine 65-min-Zeitspanne unter Drogen-Einfluß einschätzen kann. Je kleiner die SH ohne Droge, um so korrekter verläuft die Zeiteinschätzung mit Droge; je größer die SH, um so größer wird die Zeitüberschätzung, eine Zeitzusammenballung, und um so größer der „Rückpralleffekt", eine Zeitunterschätzung, oder auch Zeitdehnung 24 h nach der Drogenverabreichung.

Stabile Versuchspersonen, d. h. jene mit kleiner SH ohne Droge und auch einer kleinen Variabilität an anderen Tests der Wahrnehmung und der Verhaltensweise — mit oder ohne Droge — werden als „Maximizers" bezeichnet, weil sie unter dem Einfluß des Psilocybin sensorische Reizintensität zu erhöhen bestrebt sind, während labile Versuchspersonen, d. h. jene mit großer SH ohne Droge und auch einer großen Variabilität an anderen Tests der Wahrnehmung und der Verhaltensweise — mit oder ohne Droge — bezeichnen wir als „Minimizers", weil sie unter Psilocybin-Einfluß die sensorische Reizintensität zu verringern bestrebt sind.

Da die Psilocybin-induzierten Änderungen der Wahrnehmung und der Verhaltensweise kovariant sind, jedoch von dem Ausmaß der Drogen-induzierten autonomen Erregung sich „dissoziiert" verhalten, betrachten wir: Wahrnehmungs-Verhaltensweise als ein einheitliches Phänomen, nämlich als die symbolische Interpretation zentralnervöser Erregung.

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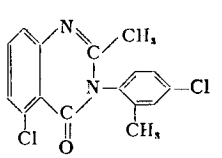
Pharmacological Studies on 2-Methyl-3(2'-methyl-4'-chlorophenyl)-5-chloro-4(3H)-quinazolinone (SL-164)

By Chiharu Saito, Sigeru Sakai, Yuriko Yukawa, Hisao Yamamoto, and Hiroshi Takagi*)

Gujral *et al.* [1] called a particular interest to the hypnotic property of quinazolinone derivatives during the course of their antimalarial program, and found that 2-methyl-3-o-tolyl-4-quinazolinone (MTQ) was the most promising agent. Meanwhile, Boissier *et al.* [2] carried out an extensive pharmacological investigation of this compound and concluded in agreement with Gujral *et al.* that this compound possessed a marked hypnotic activity. Recently, a large number of quinazolinone derivatives having hypnotic and anticonvulsant activities have been reported [3, 4].

In research for the quinazolinone derivatives, we found that, in general, 5-chloroquinazolinone derivatives had marked sedative activities with little or no hypnotic properties and with low toxicity.

In our further studies it was found that 2-methyl-3(2'-methyl-4'-chlorphenyl)-5-chloro-4(3H)-quinazolinone (SL-164) was a very effective tranquilizer. Chemical formula of SL-164 is as follows:



SL-164 is white, odorless and stable crystals, melting point of which is 160—161° C (uncorrected). It is soluble in ethanol, methanol, acetone, benzene, *etc.*, but practically insoluble in water and petroleum ether. It is prepared from N-acetyl 6-chloroanthranilic acid by reaction with 5-chlorotoluidine, and recrystalized from ethanol.

The present paper reports pharmacological properties of SL-164 with special reference to its tranquilizing activity.

Materials and methods

The following compounds were used for comparison:
7-chloro-2-methylamino-4-phenyl(3H)1,4-benzodiazepine 4-oxide hydrochloride (chlordiazepoxide),
2-methyl-2-propyl-1,3-propanediol dicarbamate (meprobamate),
2-methyl-3-o-tolyl-4(3H)-quinazolinone (methaqualone),
2-chloro-10-(3-dimethylaminopropyl)phenothiazine (chlorpromazine).

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