

表15 健常群 (MMSE \geq 24) と認知症群 (23 \geq MMSE) の生活背景と海馬形態の違い
(logistic 回帰分析)

	カイ2乗	P値	R	係数	95%下限	95%上限
年齢	.107	.743	.00	.971	.817	1.15
教育暦	6.69**	.009	-.251	.341	.153	.772
趣味	.021	.885	.00	1.12	.222	5.72
海馬内萎縮	9.29**	.002	.313	1.043	1.015	1.072
高血圧	1.094	.295	.00	.414	.08	2.16

海馬傍回の萎縮度 (%) とMMSEの間に認められた負の相関は重回帰分析の結果、質問5、11の項目と高い負の相関が認められた。また全脳の萎縮度はMMSEとの相関は認められなかった。この結果はMMSEにより抽出される認知機能は海馬の萎縮と密接な関連があり、脳全体の萎縮とは無関係であることを示唆している。生理的な加齢による脳の萎縮の程度は大脳皮質で強く、海馬の萎縮の程度は比較的少ないが、Alzheimer病では大脳皮質に比べて海馬の萎縮が極端に進むといわれている。今回の結果は、MMSEが海馬の萎縮の程度に逆相関する一方で、大脳皮質の萎縮とは有意な相関が認められず、これまでの報告を支持するものである。知的機能に教育歴が密接に関連していることが示唆された。知的機能と教育歴の関連はこれまで数多くの報告がある。これは、卒業後の職種や知的活動への関心、それに伴う生活態度の違いなど教育歴の違いに派生する様々な要因が関係していると思われる。飲酒習慣と全脳萎縮に正の相関が認められた。高齢でもあり、全体として飲酒量はそれほど多くないにも関わらず、相関が認められたことは晩酌程度の飲酒でも、脳の萎縮が見られることを示唆している。趣味の有無と知的機能検査や海馬萎縮に関連が認められたが、趣味が無いから知的機能低下や海馬萎縮が起き

るのか、あるいはその逆なのか現時点では判断できない。今後の追跡調査が必要である。

De Ronchi D, Berardi D, Menchetti M, Ferrari G, Serretti A, Dalmonte E, Fratiglioni L. Occurrence of cognitive impairment and dementia after the age of 60: a population-based study from Northern Italy. *Dement Geriatr Cogn Disord*. 2005;19(2-3):97-105.

Jobst KA, Smith AD, Szatmari M et al. Detection in life of confirmed Alzheimer's disease using a simple measurement of medial temporal lobe atrophy by computed tomography. *Lancet* 1992;340:1179-1183

4, 2 一般高齢者の認知機能と血中長鎖不飽和脂肪酸の関連。

DHA (ドコサヘキサエン酸) やEPA (エイコサペンタエン酸) 等の血中長鎖不飽和脂肪酸は神経膜細胞膜成分であるにも係わらず、生体で産生されないことから、食餌から摂取する必要がある。これらの脂肪酸の不足と、感情障害を始めとする様々な精神疾患との関連が報告されている。2006年Schaeferらは、フラミンガム研究の中で、900人規模の認知症に関する前向き研究において、血中のDHA濃度が高い方から1/4のグループはあとの3/4のグループに比べ認知症の発症危険率が47%少ないことを報告している。しかし、EPAや α -リ

ノレン酸など、DHA以外の脂肪酸の血中濃度も測定したが、認知症との関係は認められなかった。

A 目的：今回の研究で、長鎖不飽和脂肪酸と認知機能の関連を調べるために、脳検診時に採血を行いGC-MSにて、DHA, EPA, α -リノレン酸の測定を行った。

B 方法：平成17年と18年に脳検診を受けた150名の採血を行い、0.1mlの血漿からTakemotoらの方法で長鎖不飽和脂肪酸を抽出し、塩酸—メタノールを加えメチルエステル化した後、GC-MSにて定量を行った。

C 結果：DHA濃度は 20.53 ± 8.81 、EPA濃度は 6.19 ± 3.89 であった。DHA濃度はMMSE、FAB、CDR、CDTとの有意な関連は認められなかった。一方、FAB評点の13/14をカットオフポイントとして認知症群と健常群に分け独立変数とし、EPA濃度を従属変数として分散分析を行うと、認知症群のEPA濃度は 4.16 ± 2.50 であり、健常群

の 6.64 ± 3.67 より有意な低値を示した(表16)。

D 考察：タフツ大学のグループの研究では認知症発症に関連するのはDHAであり、EPAの低値とは関連を認めていない。一方、今回の結果ではDHAではなくEPAの低値が認知機能と関連していた。彼らの示した、認知症になりにくい上位1/4のグループのDHA濃度は我々の結果では中位に位置する程度である。魚の消費量からすれば、日本での消費が多いため、血中DHAレベルからみれば日本でのDHA不足による認知機能障害は少ないのかもしれない。長鎖不飽和脂肪酸と認知機能の関連については今後の追跡調査が必要である。

Schaefer EJ, Bongard V, Beiser AS, Lamon-Fava S, Robins SJ, Au R, Tucker KL, Kyle DJ, Wilson PW, Wolf PA. Plasma phosphatidylcholine docosahexaenoic acid content and risk of dementia and Alzheimer disease: the Framingham Heart Study Arch Neurol. 2006;63:1545-50.

表 16 Compound	Total Mean \pm S.D.	Dementia group (FAB \leq 13)	Normal group (FAB \geq 14)
OA(C18:1,n-9)	39.54 \pm 12.42	40.44 \pm 12.19	38.25 \pm 13.02
LA(C18:2,n-6)	54.30 \pm 18.07	60.99 \pm 26.60	53.11 \pm 15.96
AA(C20:4,n-6)	22.88 \pm 10.75	23.90 \pm 17.09	22.77 \pm 9.86
EPA(C20:5,n-3)	6.19 \pm 3.89	4.16 \pm 2.50*	6.64 \pm 3.67
DHA(C22:6,n-3)	20.53 \pm 8.81	21.19 \pm 9.25	19.15 \pm 8.06
n-6/n-3	3.28 \pm 2.07	3.30 \pm 2.61	3.25 \pm 2.11

PUFAs: Polyunsaturated fatty acids; OA: Oleic acid; LA: Linoleic acid; AA: Arachidonic acid; EPA: Eicosapentaenoic acid; DHA: Docosahexaenoic acid; n-6/n-3: AA+LA/EPA+DHA. The values were presented as $\mu\text{g}/100\mu\text{l}$ of plasma. * $p < 0.01$

Takemoto Y, Suzuki Y, Horibe R, Shimozawa N, Wanders RJ, Kondo N. Gas chromatography/mass spectrometry analysis of very long chain fatty acids, docosahexaenoic acid, phytanic acid and plasmalogen for the screening of peroxisomal disorders. *Brain Dev.* 2003; **25**(7):481-487.

4, 3 唾液中3-methoxy-4-hydroxyphenyl glycole (MHPG)濃度と知的機能の関連

これまで、アルツハイマー病の中樞ノルアドレナリン神経系の異常が数多く報告されている。すなわち、アルツハイマー病の脳脊髄液中のノルアドレナリン最終代謝産物であるMHPG濃度は高値を示す(Sheline et al, 1998; Tohgi et al, 1992; Martignoni et al, 1992; Liu et al, 1991; Brane et al, 1989)。また、MMSE評点と脳脊髄液中MHPG濃度やノルアドレナリン濃度に高い負の相関が報告されている。最近唾液中MHPG濃度は血中や脳脊髄液中のMHPG濃度を反映するという報告もある。しかし、一般健常高齢者のMMSEとMHPG濃度の関連について検討した報告は無い。

A 研究目的：今回脳検診に参加した地域在住の高齢者の唾液中MHPGを測定し、種々の知的機能検査との相関を調べ、唾液中MHPG濃度がDAT早期診断の指標としての妥当性を検討した。

B 研究方法：被験者の唾液を専用のスピッツを用いて採取し、内部標準物質として13C6-MHPG 10 ngを加え、酢酸エチルで抽出し、*t*-orifluoroacetate で誘導体化した後、GC-MSにて唾液中MHPG濃度の測定を行い、知的機能

検査(MMSE, FAB, CDR, CDT, BDI)との関連を調べた。

C 研究結果：126例の高齢者(男性 年齢 78.4 ± 7.7 才, $n=30$; 女性 年齢 78.3 ± 6.8 才, $n=96$)の唾液中MHPG濃度は男性 12.2 ± 6.3 ng/ml、女性 15.9 ± 8.1 ng/mlであり(表17)、有意に女性が高く、年齢と正の相関が認められた(女性 $r=0.21$, $P=0.02$; 男性 $r=0.36$, $P=0.04$)。また女性において唾液中MHPG濃度はMMSEと高い正の相関が認められた($r=0.331$, $P=0.006$)が男性では相関は認められなかった。女性で認められた有意な正の相関はMHPGを年齢で補正しても認められた($r=0.258$, $P=0.016$)。女性のMMSEの24/25をカットオフポイントとして健常群、認知症群に分けると健常群の唾液中MHPGは 14.93 ± 6.04 ng/ml、認知症群の唾液中MHPGは 21.2 ± 12.81 ng/mlであり、両群間に優位差が認められた($t=-2.81$, $P=0.006$ 表20)。一方、男性ではこの有意差は認められなかった($n=30$, $t=0.56$)。また、MMSEはFAB, CDR, CDT, BDI評点と有意な相関は認められなかった。

D 考察：唾液中MHPG濃度は年齢と正の相関があり、特に女性では年齢による増加を補正してもMMSE評点と有意な正の相関が認められた。このことはこれまで報告されていたアルツハイマー病において認められていたMHPG濃度の増加が一般高齢者においても認められることを示唆している。その機序として加齢に伴い脳の神経細胞が脱落することにより、それを補うためにノルアドレナリン神経系の代謝回転の亢進が進みMHPG濃度の増加が起こるといわれている。一方、男性では加齢によるMHPG濃度の増加は認められるものの、知的

機能低下との相関は認められず、知的機能低下に伴うノルアドレナリン神経系の変化に性差があることが示唆された。今回の結果は男性の例数が少なく、今後例数を増やして更に検討する必要があるが、一般に高齢になるにつれて女性の知的機能低下は男性に比べ促進しやすいことが報告されている。すなわち加齢に伴う女性ホルモンの低下が神経保護作用の低下を招くと考えられている。女性の知的機能低下の要因として女性ホルモンの低下によるノルアドレナリン神経活性の脱抑制が関与している可能性が示唆される。更に、今回の指標に用いた唾液の分泌はACh神経の影響を受けており、アルツハイマー型認知症の場合ACh神経の脱落があることから、唾液分泌が

抑制され、唾液量の減少のためMHPG濃度が相対的に増加し、MMSEとの逆相関が増強した可能性も考えられる。

今回の結果は少なくとも女性において唾液中MHPG濃度の測定が知的機能低下の予測因子として検討する価値があると思われる。またMMSE以外の知的機能評価（FAB, CDR, CDT）が唾液中MHPG濃度と関連が無かったことはMMSEがFAB等に比べより広い脳領域の機能を反映することと関連しているのかもしれない。またMHPG濃度の増加がアルツハイマー病で認められ、脳血管性認知症で認められないという報告があり、唾液中MHPG濃度の測定は認知機能低下を来すアルツハイマー病以外の認知症性疾患の鑑別にも使用できる可能性もある。

表17. The demographics of this study

	Male	Female	Statistical significance
N	30	96	
Age	78.4(7.7)	78.3(6.8)	ns
sMHPG	12.2(6.3)	15.9(8.1)	t=2.22, P=0.028
MMSE	26.7(3.0)	26.5(3.8)	ns
CDT	8.7(1.1)	8.2(1.9)	ns
FAB	14.8(2.4)	14.9(2.1)	ns
BDI	8.5(10.0)	11.0(8.5)	ns

Parenthesis represents a standard deviation.

表18. The correlation between the performance of cognitive tests and BDI

	MMSE	CDT	FAB	BDI
MMSE		0.49**	0.44**	-0.17
CDT			0.364**	-0.12
FAB				-0.192*

表19. The correlation between sMHPG and the performance of cognitive tests.

	Male		Female	
	r value	P value	r value	P value
MMSE	0.116	0.561	-0.270*	0.0137
CDT	0.242	0.216	-0.049	0.666
FAB	-0.13	0.513	-0.153	0.171
BDI	-0.148	0.456	-0.154	0.168

MMSE: mini-mental state examination; CDT: clock drawing test; FAB: frontal assessment battery; BDI: Beck Depression Inventory. * P<0.05

表20 sMHPG (ng/ml) in subjects with or without cognitive deficit

	MMSE<24	MMSE>25	P
All subjects(126)	18.79±12.17	14.22±6.15*	0.0187
Male(30)	10.46±2.97	12.22±6.16	0.583
Female(96)	21.18±12.81	14.93±6.04**	0.0061

*P<0.05; **P<0.01

今後、3年後に同様の検査を行い、将来の認知症への進展に最も関係するパラメーターを特定することにより、より正確なMCIの診断が可能になることが期待される。(倫理面への配慮)

以上、全ての研究において、被験者には研究への協力は任意であり、発表の際には個人を特定できる情報は一切出さないこと、研究へ不参加の場合にも何ら不利益は生じないことを口頭で説明し、文書で同意を得た。尚、本研究は佐賀大学医学部倫理委員会の承認を得ている。

おわりに 本研究は筆者が久留米大学医学部附属脳疾患研究所時代に指導頂いた故小島秀

樹博士が、地元の病院に戻られライフワークとして平成2年から始められたものである。地域医療の核として地元の有志と共に、今後の超高齢化社会を念頭に認知症予防活動としてコホート研究が開始された。先生は熱心な研究活動を続けられていたが、平成11年に志半ばにして事故で亡くなられた。その後この研究は分担研究者である原岡一馬久留米大学名誉教授のご指導の下に、社会心理学的な立場から研究は続行されていた。しかし精神医学的なデータは手つかずのまま残っていたため何とか形にしたいと、この活動に参加した次第である。従って本報告書の成果の多くは故小島秀樹先生の努力のたまものである。今後

新たに240名のコホート研究を開始し、この研究を続行していく予定にしている。研究に協力頂いた、敬愛会、地元老人会の方々に深謝いたします。

分担研究者

久留米大学名誉教授 原岡一馬
ハーバード大学 川島哲郎
久留米大学文学部 今村義臣

研究協力者

敬愛会 小島直樹
岩谷トモ子
佐賀大学医学部精神医学講座
立石哲也、渡辺 至、国武 裕、
菅高一博、村岡稔史、李光荣
佐賀大学医学部脳斜線科
内野 晃

G. 研究発表

1. 論文発表

Association between the scores on the general health questionnaire-28 and the saliva levels of 3-methoxy-4-hydroxy phenylglycol in normal volunteers. Li GY, Ueki H, Yamamoto Y, Yamada S. Biol Psychol. 2006 Aug;73(2):209-11.

クエチアピンにより精神症状およびプレパルスインヒビションの減弱が改善した1症例、奥 栄作、山田茂人、三根禎行、吉本静志、中川龍治、新薬と臨床, 55(1): 62-67, 2006.

在宅高齢者の「かなひろいテスト」成績の経時変化、渡辺 至、小島 直樹、岩谷 トモ子、川島 敏郎、國武 裕、菅高一博、原岡 一馬、立石 哲也、山田 茂人、九州神経精神医学雑誌 印刷中

Human health among students in information-oriented society; prevalence and psychological status in relation to internet addiction. Sato T., Nakashima K, Kidoh K, Yamada S, Japanese Journal of General Hospital Psychiatry., 18, 131-138, 2006

2. 学会発表

地域在住の一般高齢者の知的機能とBeck Depression Inventoryとの関連 立石哲也、渡辺 至、国武 裕、山田茂人 第102回日本精神神経学会総会、福岡

身体活動のメンタルヘルス向上に対する影響 上川英樹、山田茂人、植木裕司、松永みな子、奥 栄作、渡辺 至、国武 裕 第102回日本精神神経学会総会、福岡

一般高齢者の老化に関する長期縦断疫学研究—海馬萎縮と知的機能の経時変化— 国武 裕、山田茂人、立石哲也、渡辺 至、第28回日本生物学的精神医学会、名古屋

高齢者の知的機能とカルトニリン神経活性、渡辺 至、立石哲也、李光荣、国武裕、小島直樹、川島敏朗、山田茂人、第28回日本生物学的精神医学会、名古屋

Determination of paroxetine in a human saliva by HPLC with a UV detection, Yamada S., Tsuruta T, Yang C, Ueki H., Li GY, Fujito H, Somehara T., 第36回日本神経精神薬理学会、名古屋

うつ病患者の唾液中Fluvoxamine濃度測定の有
有用性と妥当性：楊春燕、鶴田李典、上川英
樹、植木裕司、奥 栄作、李 光荣、江上 真
紀、藤戸 博、山田茂人、第16回日本臨床精
神神経薬理学会、北九州

うつ病患者の唾液中Paroxetine最適波長決定
による有用性と妥当性：鶴田李典、楊春燕、
上川英樹、植木裕司、松永みな子、奥 栄作、
李 光荣、立石哲也、藤戸 博、山田茂人、
第59回九州精神神経学会、沖縄

Relation between elderly people's everyday behavior and intellectual psychological feature

Kazuma HARAOKA

Summary

It becomes aging society, and senior citizen's health and the problem of the dementia syndrome prevention are becoming targets of the concern. It is guessed to this tendency it is related to senior citizen's action in daily life and way of life. It was assumed that an ideal process of making to aged was described and came to have been used the idea "Successful aging and ideal aged" among researchers of the United States gerontology in recent years. The research that had been done about successful aging was a comparison of the state of an excellent physiology and psychosocial senior citizen and the state of a usual senior citizen.

What one is the concept named successful aging? It can be said that it is a concept of comprising three content of "It lives long, it is healthy, and has the something to live for satisfaction".

What result did the senior citizen dementia prevention practice activity of the Imari City Kurokawa-cho of current year achieve?

In this thesis, the answer of the senior citizen who investigated in fiscal year 2004 was analyzed, and what influence the ideal way of the action had had in the intellectual level, the something to live for satisfaction rating, and the social support in daily life was examined.

The subjects who answer about this investigation are senior citizens of 65 years or more of the Saga Prefecture Imari City Kurokawa-cho living, and 154 people (43 men and 111 females) who answer all of the investigation of the action in daily life, the investigation of an intellectual level, the investigation of the something to live for satisfaction rating, and the social support investigation, and did not leak.

Consequently, the following matters were clarified.

(1) The number of actions in daily life statistically correlates to the following characteristics by a high level. That is, it is an intellectual level, a something to live for satisfaction rating, a stable satisfaction rating, a positive satisfaction rating, and a social support. However, the number of actions in daily life was not related to the age. That is, the elderly people with many everyday actions maintain a high intellectual level, definite-aim-in-life satisfaction is also high, and there is also much support from the others, and the way of life called so-called successful aging is performed.

(2) The number of actions at free time is related high to an intellectual level and a something to live for satisfaction rating, a stability satisfaction rating, a positive satisfaction rating, and the amount etc.

of a social support. It can be said that more the number of actions at free time is, the higher the level of each characteristic is.

(3) In the relations about the number of pleasure, and intellectual, relations with the degree of definite-aim-in-life satisfactory, and all the relations with a social support score, it turned out that a man with many pleasure is high. Moreover, it turned out that there is no relation between the number of pleasure and the stage of age. That is, in any age, the man with many pleasure is that it is high in an intellectual level, and is high also in definite-aim-in-life satisfaction, and there is also much assistance from other men.

Setting up the target adapted to oneself in everyday life from the above research result, and living happily positively leads also to prevention of Alzheimer's disease, and it turns out that a relation with other men also becomes good. This is considered to be being able to say to the elderly people of every age.

Purpose of this research

In recent years, the researchers of U.S. gerontology describe an ideal aging process, and have been developing various notional frameworks utterly. The term "successful aging" is used best and R.J.Havighurst (1961) uses well. What kind of thing is the concept of successful aging? It is also a fact that the meaning makes it vague although used well, a clear and single definition is not found, but the focus changes with researches. There are some which it prescribed "Obtain satisfaction to a life as age is piled up" in inside, and there are some which it prescribed "It lets the process of life pass and complete the ideal development function of plus." Moreover, elderly people are in a healthy and happy state (well-being) physically, socially, and mentally, and there are some which say that it is in a satisfactory state in a relation with the others also about themselves. Probably, it may consider the contents which include the three contents, have living for a long time, a healthy thing, and definite-aim-in-life satisfaction, (Palmore1995).

Even in Japan, the activity of a community whose elderly people can have definite aim in life happily in various places is being performed. It seems that however, there are not so many places which are doing investigation research of the effect of practice activities scientifically. The writer has participated in "Alzheimer's disease prevention promotion activities" in Imari-shi, Saga for about ten years.

There, in order for administration and the volunteer of an area to cooperate and to do practice research, elderly people plan "the production classroom of definite aim in life" as activity of the community which can have definite aim in life happily, build an object area, and have been appealing for elderly people's participation. There are a rhythmical-exercises classroom, a ceramic art classroom, a karaoke classroom, the Taisho koto classroom, a game-of-go classroom, etc. as the

classroom, and it has carried out 1 time every week or 1 time per biweekly week. Moreover, being helped each other by the neighborhood in a community is also cried for simultaneously.

What kind of result did this activity mention? Here, mainly based on the reply investigated in the 2004 fiscal year, it will be shown how the state of action every day has influenced the degree of intellectual characteristic and definite-aim-in-life satisfactory, the quantity of social support, etc.

Subjects and Method

Subjects for investigation

The subjects for investigation are 65 or older-year elderly people living in Kurokawa-cho, Imari-shi, Saga-ken, During the Heisei 16 fiscal year, it will participate every day in action investigation, intellectual grade investigations, the degree investigations of definite-aim-in-life satisfactory, and all the social support investigations, and they are 154 persons (43 men, 111 women) without the omission in a reply.

Investigation methods

The investigations conducted here were investigation of daily action, investigation of an intellectual level, investigation of the degree of definite-aim-in-life satisfactory, and investigation of social support. These investigations were conducted using the individual interviewing method. The interviewer was the woman leader and public health nurse who have contact with the elderly people of this area usually, and get interested in social welfare.

The investigation domain performed by this research is as follows.

(1) Investigation of everyday behaviors

The following contents are included in this investigation. ① Action at free time ② useful consideration for family life and ③ on work by home and ④ hobby and ⑤ the enjoyments

The example for selection was shown in all question items. And it was the method of checking what applied. It asked to describe freely, when an answer was not applied to an example.

For example, about work at home, there were choices, such as a grandchild's care, shopping of daily necessities, cooking, selection, cleaning of the room, care of a flower or plants, repair and carpenter work of furniture, and needlework, sewing. When not applied to these items, the free description column was prepared.

(2) Investigation of an intellectual level

The inspection about an intellectual level is the test which performs it individually using "test of kana character selection" of Kaneko (1990). This makes two or more work distribute

attentiveness, and measures how one task is performed to within a fixed time. It is a subject which picks up and checks the vowel of the "Japanese alphabet" simultaneously out of the easy text written in "hiragana" while reading a meaning. Inspection time is for 2 minutes. When results of an investigation are examined until now, the score of the person with high age tends to be low.

(3) Investigation of something to live for satisfaction rating

This is an investigation of the something to live for satisfaction rating, and what Haraoka proposes by the research first and has been used by the research (1995) and used by the researches afterwards. It is a question on the satisfaction rating of ten areas of life. Namely, 1. sense of security of life, 2. the pleasure of life, 3. satisfaction in everyday life, 4. a feeling of peacefulness in everyday life, 5. responsiveness in a daily life, 6. target of a life, 7. grade made reliance from the others, 8. grade which the surrounding man is permitted, 9. numerousness of the places of capability exertion, 10. strength of a posture which tackles a new thing. Two factors of the degree of stable satisfactory and the degree of positive satisfactory as a result of factor analysis, is confirmed.

(4) Investigation of social support

This measure referred to the measure of ISEL (Cohen, S. & Wills, T.A., 1985), SSQN (Sarason I.G., et al. 1983), Ura et al. (1989), and Noguchi (1991), and created the measure for elderly people.

First, the following domains of 10 were chosen and it asked for how much man many there is in each domain with the four-step measure. Those synthesizing points were considered as the social support score. Those domains are as follows. 1. Those who you meet and can enjoy themselves, 2. Those who you can order business when out, 3. Those who always take care of you, 4. Those who you can consult when you are troubled, 5. Those who can telephone or visit when you are lonely, 6. those who encourage you, 7. Those who become kind and help you when uneasy, 8. Those who value you or esteem you, 9. Those who get used to the feeling which settled down when it was together, and 10. Those who take care of you when it is sick .

Result of Investigation

First, the total of the number of work at home, the useful number of families, the number of free time actions, the number of hobbies, and the number of pleasure was made into the number of actions every day.

First, the number of work at home, the useful number of families, the number of free time actions, the number of hobbies, and the number of pleasure were confirmed, and the total of these five

numbers of actions was specified as the number of actions every day.

Next, relation between the number of actions and other indices, such as the degree of average age, intellectual grade, and definite-aim-in-life satisfactory and a social support score, was clarified this every day. Then, relation between "the number of the actions in free time" and the "number of pleasure" which are considered that there is an important relation, and the degree of average age, intellectual grade, and definite-aim-in-life satisfactory and social support was clarified.

1) Mutual correlation between each index

Table 1 shows the mutual correlation coefficient between the following indices. those indices can be set at age, the number of work in a home, and a home -- useful -- consciousness, the number of pleasure, the number of hobbies, the number of pleasure, the number of everyday actions, the degree of stable satisfactory, the degree of positive satisfactory, the degree of definite-aim-in-life satisfactory, the amount of social support, and an intellectual grade.

Table 1 Correlations between actions, intellectual, and other psychological characteristics

	1	2	3	4	5	6	7	8	9	10	11
1.Age	1										
2.number of home work	-0.100	1									
3.Useful consideration for family	-0.184	0.465	1								
4.Actions at free time	-0.089	0.408	0.482	1							
5.Number of hobbies	-0.051	0.433	0.394	0.602	1						
6.Number of enjoyment	-0.062	0.398	0.446	0.674	0.670	1					
7.Actions in everyday	-0.097	0.693	0.641	0.796	0.819	0.872	1				
8.Sense of security	0.075	0.238	0.171	0.250	0.162	0.368	0.425	1			
9.Sense of positivities	0.008	0.202	0.188	0.316	0.294	0.383	0.461	0.793	1		
10.Satisfaction in everyday	0.043	0.241	0.199	0.315	0.256	0.415	0.469	0.944	0.949	1	
11.Social supports	0.049	0.192	0.169	0.307	0.203	0.402	0.356	0.600	0.605	0.664	1
12.Level of intelligence	-0.279	0.317	0.258	0.353	0.282	0.290	0.364	0.201	0.260	0.244	0.287095

On the whole, Table 1 shows that the number of everyday actions are not almost related to age ($r=0.097$). But, except for a relation with age, the number of actions in everyday correlates with other action features highly significantly. For example, with an intellectual grade -- ($r=0.364$) and with the degree of definite-aim-in-life satisfactory -- ($r=0.426$) and the degree of stable satisfactory -- ($r=0.469$) and with the degree of positive satisfactory ($r=0.461$) and social support ($r=0.356$) etc.

Of course, the correlations between everyday number of actions and with other actions are very high, for example, with the number of work in a home can be set at $r= 0.693$ and useful considerations for family ($r= 0.641$) and the number of actions of free time ($r= 0.796$) and hobbies - ($r= 0.819$) and pleasure ($r= 0.872$), These correlations are very high.

It seems that you may think as for any age, a lot of numbers of actions in daily life keeps an intellectual level high, the something to live for satisfaction high, there a lot of supports from others, and does the way of life so-called called successful aging.

2) Relation between number of actions in daily life and psychological characteristics

The number of actions was divided into three stages of the high group (person with a lot of numbers of actions), middle groups (The number of actions is the normal people), and low groups (person with little number of actions) in daily life. Next, the relation between the action stage in daily life and the age stage was examined, the relation between an action stage and an intellectual level was examined in daily life, the relation between the action stage and the something to live for satisfaction rating was examined in daily life, and the relation between the action stage and the social support score was examined in daily life. The result is shown in figure from table and Fig.1 to Fig. 7 of Table 2.

Table 2 The means of ages according to action stages in daily life

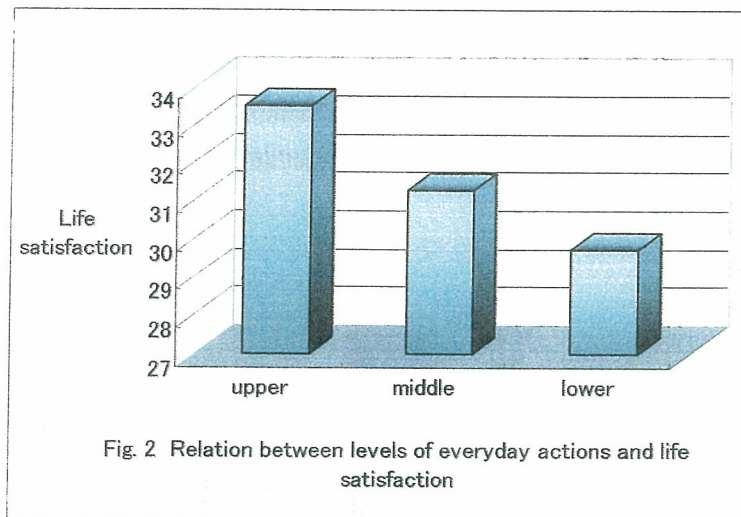
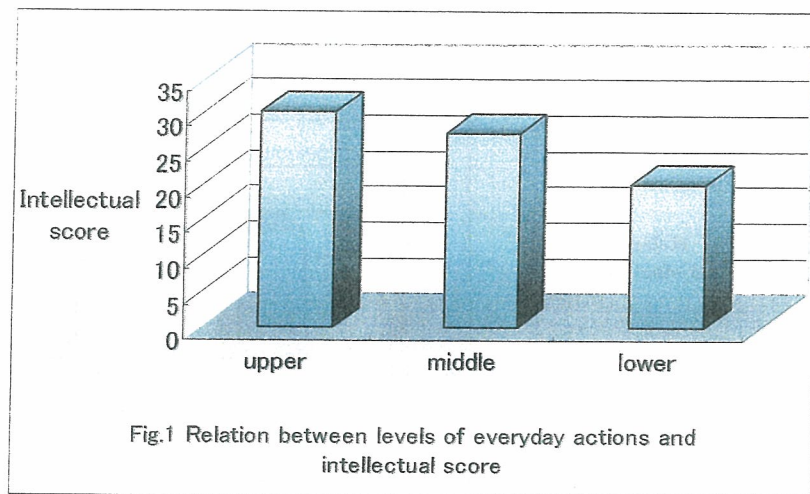
Action stages	n	mean	variance
upper	44	77.66	18.60
middle	57	79.04	40.75
lower	50	79.00	45.47

It is understood that there is no difference between daily lives of a group with a lot of numbers of actions and small groups of the number of actions in the average age. In a word, there are a person with a lot of numbers of actions and little person in any age in daily life. Differences of the number of actions come to originate in the individual variation in daily life.

Next, Fig.1 shows the relation between the level of the everyday number of actions, and an intellectual scores.

Fig. 1 shows the following thing. That is, it turns out that the correlation with the level of the everyday number of actions and the intellectual score is very high. If the average of an intellectual level is considered, the higher rank group of the everyday number of actions is 30.18 and for middle group, It is 27.15, and for a low rank group, It is 20.06. It turns out that the

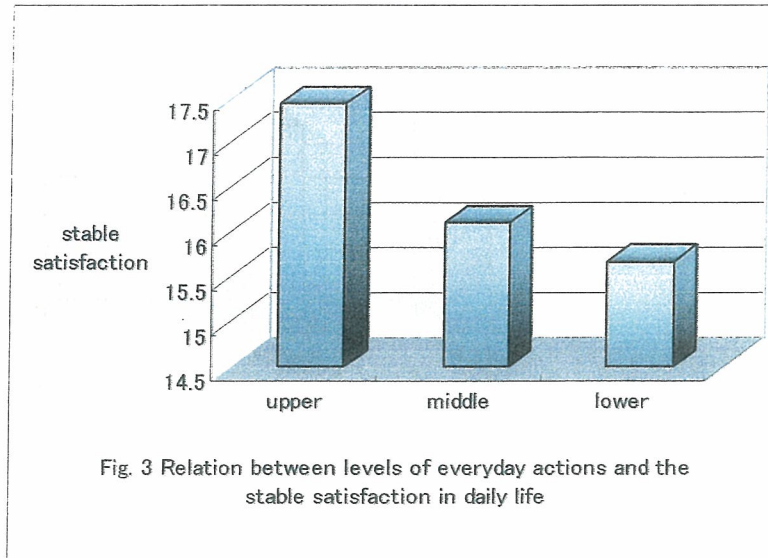
numerousness of the everyday numbers of actions has an intellectual grade and high correlation.



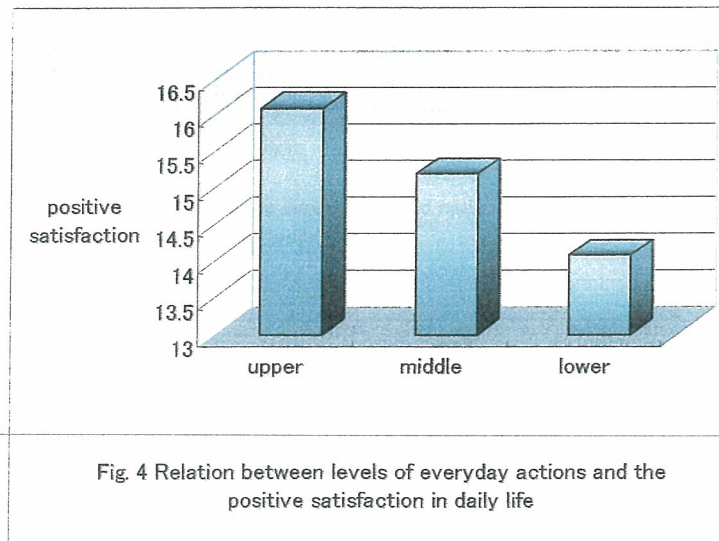
When Figure 2 was examined, it turned out that high correlation is between the numerousness of actions in everyday and the degree of life satisfaction. The group with many actions in every day has higher satisfactory than middle and few groups ($F= 8.79, p<.01$).

Next, the relation between the level of action in every day and the degree of stable satisfactory is

shown in Fig.3.



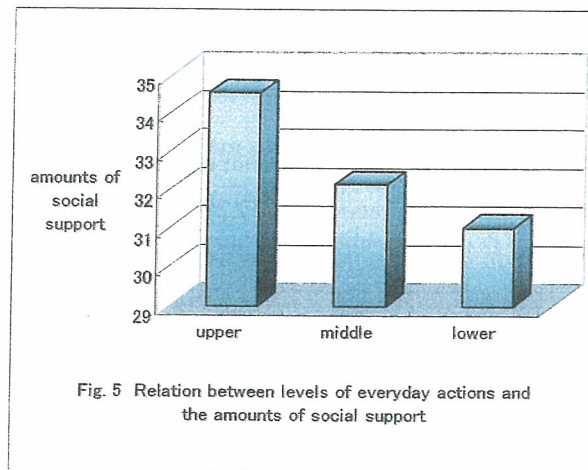
There is a high correlation between the number of actions and the stability satisfaction rating in daily life when Figure 3 is examined, and the crowd with a lot of numbers of actions is usually higher than a crowd and few crowds a psychological stability satisfaction rating, and understands the lowest is usually crowd order of a low crowd next in daily life ($F=7.64, p<.01$). In a word, the stability satisfaction rating can be said that more the number of actions is, the higher the stability satisfaction rating is in daily life. This tendency is similar to the something to live for satisfaction rating.



When Fig.4 is examined, the relation between action level in daily life and positive satisfaction

rating are very high. and the height of a positive satisfaction rating understands it is high in order of a crowd and inside level crowds with a lot of numbers of actions and few crowds in daily life ($F=7.12, p<.01$). In a word, it can be said that more the number of actions is, the higher a positive satisfaction rating is in daily life.

It is interpreted that the number of actions understands there are a something to live for satisfaction rating, a stable satisfaction rating, a positive satisfaction rating, and a high relation from the above-mentioned research result in daily life, and that shows that many of the number of actions are connected with successful aging in daily life.



Next, it is Fig.5 to have seen the relation between the action stage and the amount of the social support in daily life.

It relates from Fig.5 high to the action stage and the amount of a social support in daily life. As for the average score of a positive satisfaction rating, it is understood that it is high in order of a crowd with a lot of numbers of actions and a crowd and few usual crowds in daily life ($F=6.77, p<.01$). In a word, it can be said that more the number of actions is, the higher the amount of a social support (amount thought to be able to gain help and can power from the person) is in daily life.

3) Relation between number of actions and psychological characteristic at free time

One of the measures which measures the quantity which can act with its own intention, without receiving no regulation is the number of actions in free time. Then, it divided into 3 of a higher rank group with many actions, a middle group with the ordinary number of actions, and a man low rank group with few actions groups based on the average value and standard deviation of the number of actions in free time.

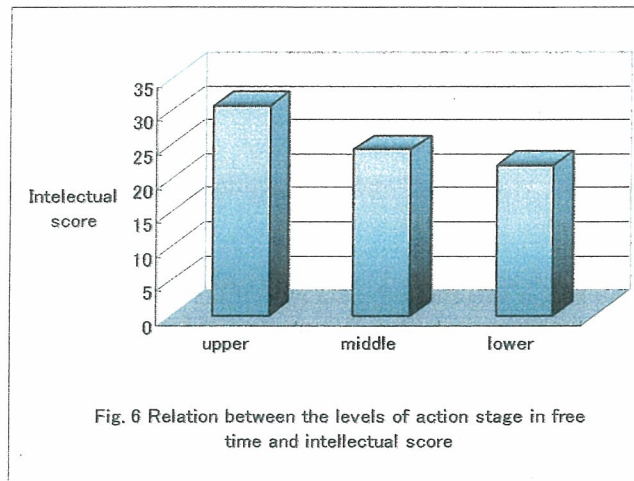
It was inquired by the following four relations based on this. Namely, 1. The relation of the number of actions in free time and age stage, 2.the relation of the number of actions in free time and

intellectual level, 3. The relation of the number of actions in free time and the degree of -life satisfactory, 4.the relation of the number of actions and social support score in free time, The result is shown in Table3, Fig.6, Fig.7, Fig.8, Fig. 9, and Fig. 10.

Table 3 Relation between number of actions at free time and averages of ages

number of actions	n	averages of ages	variance
upper	51	78.29	29.09
middle	48	79.29	35.66
lower	52	78.33	43.24

As Table 3 shows, the average age of a group with many actions is 78.29 years old and the average age of group with middle number of actions is 79.29 years old and that of low number of actions is 78.33 years old. It is thought that the number of actions in free time is based on individual difference regardless of age.



Next, let's find the relation of the action stage in free time and intellectual levels.

Fig. 6 shows the following thing. The action stage in free time and intellectual level are highly related. The average score of an intellectual test is 30.68 by the group with many actions in free time, is 24.30 by the group of a degree in the middle, and is 21.92 by few groups. It can be said that such a high intellectual level is maintained that there are many actions in free time ($F= 6.77, p<.01$).

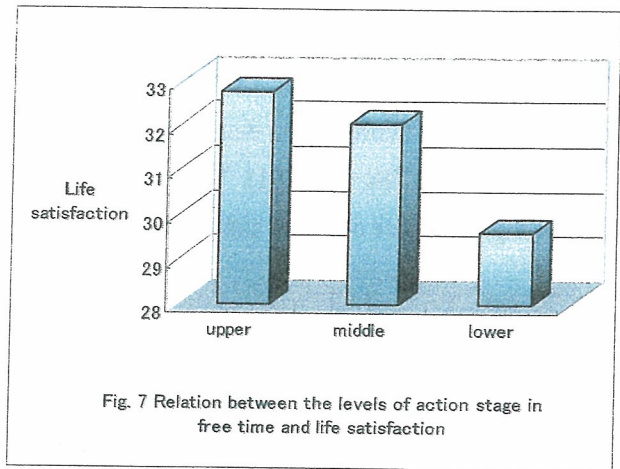


Fig. 7 Relation between the levels of action stage in free time and life satisfaction

Next, Fig.7 showed the relation between the stage of the number of actions in free time, and the degree of useful joy.

When Fig. 7 is examined, it turns out that the number of actions in free time and the degree of useful joy are highly related. It divides into three groups, many groups, a common group, and few groups, on the basis of the number of actions in free time. When it sees about the average score of "useful joy", the score of many groups is 32.75, the average of a group is usually 32.04, and the average of few groups is 29.62. ($F= 7.175, p<.01$) . That is, it could be said that a man with more actions in every day has the higher grade of "useful joy."

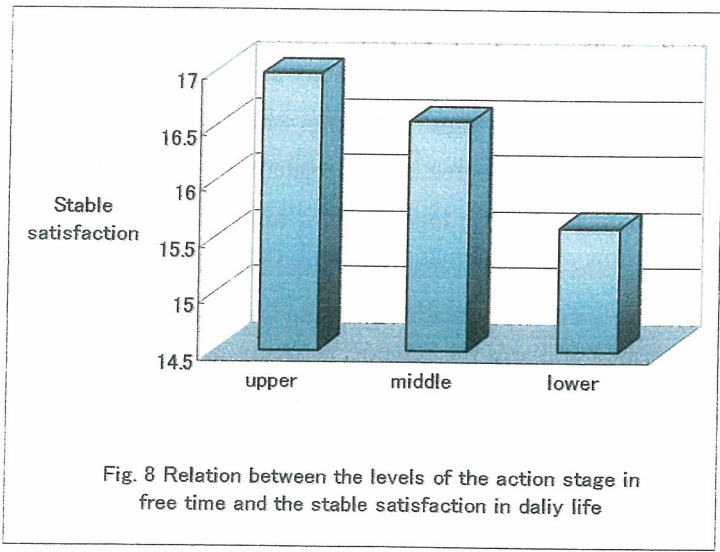
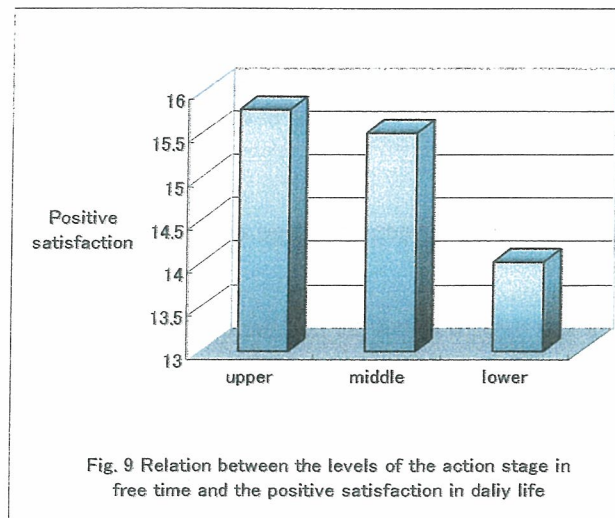


Fig. 8 Relation between the levels of the action stage in free time and the stable satisfaction in daly life

Next, Fig. 8 considered the relation between the number of the actions in free time, and a stable satisfactory degree.

When Fig. 8 is examined, it turns out that high correlation is between the number of actions and the

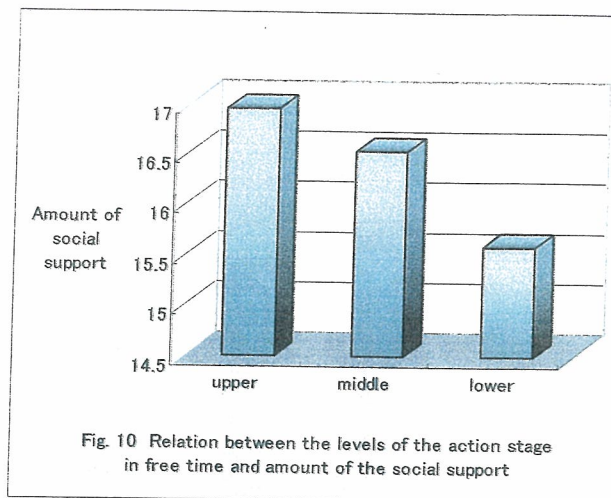
degrees of stable satisfactory in free time. When the average of the degree of stable satisfactory is seen, the group with many everyday actions is 16.96, a group is usually 16.53, and few groups are 15.59. This is understood that the score of the degree of stable satisfactory is high in order of the everyday number of actions ($F=4.784$ $p<.01$). That is, it could be said that a man with more everyday actions has the higher degree of stable satisfactory.



Next, Fig. 9 illustrated the relation of the number of actions and the degree of positive satisfactory in every day.

When Fig. 9 is examined, the relation of the stage of the number of actions and the degree of positive satisfactory in free time is very high. The group with many actions in free time has the high degree of positive satisfactory like the degree of stable satisfactory compared with a middle group or a low group. Moreover, compared with a low group, it turns out that a middle group is high ($F=6.860$, $p<.01$). That is, it turns out that a man with more actions of free time has the higher degree of positive satisfactory. Moreover, if the relation between the degree of positive satisfactory and the number of actions in free time compares the relation between the degree of stable satisfactory, and the number of actions in free time, it will be considered for the degree of positive satisfactory to be a little stronger than the degree of stable satisfactory.

As mentioned above, it turns out that the numerousness of the numbers of everyday actions is highly connected with both the degree of useful joy the degree of stable satisfactory and the degree of positive satisfactory. It is interpreted as the number of actions being highly connected with a positive way of life and positive sense of security every day.



Next, the relation of the number of actions in free time and the quantity of social support (quantity which thinks can obtain assistance and power attachment from people) is shown in Fig. 10. It turns out that the numerousness of the everyday numbers of actions is highly connected with both the degree of useful joy the degree of stable satisfactory and the degree of positive satisfactory. It is interpreted as the number of actions being highly connected with a positive way of life and positive sense of security every day.

4) Relation between the number of pleasure, and a psychological feature

There are some which measure the quantity of the action which can be freely performed happily by its intention. The number of pleasure is one of them.

Then, the number of pleasure was divided into the following three groups based on average value and standard deviation. That is, they are a higher rank group (man with many pleasure), a middle group (person with the ordinary number of pleasure), and a low rank group (man with few pleasure). Next, the relation between the stage of pleasure and the mental characteristic was considered from the following four viewpoints. That is, they are the relation between pleasure and age, the relation between pleasure and an intellectual level, the relation between pleasure and useful joy, and the relation between pleasure and a social support score. It is shown to have examined the relation between these from Table 4 and Figure 11 to Figure 15.

Table 4 Means of ages by levels of enjoyments

enjoyment	n	averages of ages	variance
upper	51	78.29	29.09
middle	48	79.29	35.66
lower	52	78.33	43.24