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# Understanding General Activity Motivation for Persons with Stroke—A Reversal Theory Perspective

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***Abstract***

*Introduction: Motivation is the barrier identified for clients with stroke to reintegrate community living. Reversal Therapy may help to understand the pattern of bipolar variations of motivational factors. This study analyzed the general activity motivation of clients with stroke and their relationship with community participation and mental wellbeing. Methodology: Sampling of 115 subjects including 30 stroke clients and 85 normal subjects. Measurements included the validated Chinese version of General Activity Motivation Measure (GAMM), Community Integration Questionnaire (CIQ) & Short Warwick Edinburgh Mental Wellbeing Scale (SWEMWBS). Results: In GAMM, the normal group scores (Mean 50.09 SD 5.79) higher then clients with stroke (Mean 46.09; SD 8.00) ($p < 0.05$). GAMM correlated positively with CIQ and SWEMWBS ($p < 0.05$). Four factors identified under GAMM namely Means-end, Relationship, Rules and Transactions that identified with Reversal Theory. Reversals between poles of each domain evidenced between two groups. "Acquiring new experiences" was strong predictor for community integration. Conclusion: Reversal Theory is useful to explain motivational changes among clients with stroke. To develop chances of "new experiences", "feel accomplishment every day", "get out of house regularly" and "to do the things that they can enjoy" at "their own pace" are the motivators for reintegrate into community living.*

***Keywords***

*motivation, community integration, reversal theory, stroke rehabilitation*

## 1. Introduction

In studies of participation in activities, motivation is defined as personal interest or desire. It has often been considered as one of a number of forces that may increase the likelihood of participation in an activity (Ajzen, 1991). However, most chronic disease did not resolve spontaneously and not cured completely. Their life changed either abruptly or gradually and might result in psychological consequences which we saw as motivational problems (Katon et al., 2003). The clients with chronic diseases were inclined to low levels of physical activity and more likely to be unemployed (AIHW, 2015). They were not motivated to be physically active by repeated encouragement and verbal instruction (Gudrun et al., 2009). Maclean and some others had paid effort in analyzing the factors

affecting their motivation for rehabilitation (Maclean, Pound, Wolfe, & Rudd, 2002). However, from the professional report, even for those who were motivated for receiving therapy continuously, they were not motivated to be active in living their post stroke life. Conventional stroke rehabilitation worked only on the body parts might not contribute to their integration in all aspects of living in the community (Gadidi et al., 2011).

It was believed that motivation was affected by perceived barriers to act. Motivation also contributed to the resultant behavior in activity participation (Caro et al., 2009). Although the Reversal Theory (Apter, 1982) was popular since its introduction in the eighties in explaining motivation in terms of behaviour, cognition and perception, its application in rehabilitation and chronic disease management was seldom (Thetcher et al., 2007). There were four pairs of motivational states, namely "means-ends", "rules", "transactions" and "relationships" where each was composing of bipolar opposites and can be operative one at a time (Appendix 1). The intra-individual change in current experience of persons with stroke might have altered their pattern of "motivational dominance" under this framework. Reversal Theory might be suitable to explain and predict the emotional changes that were experienced as a result of injury or disease. Ultimately the theory might help to understand the motivational factors that were associated with successful rehabilitation.

*1.1 Objective*

Rehabilitation aimed for facilitating better community re-integration and the ultimate criteria for a successful therapy. However, it was not obvious that their physical functions recovery directed resumption of active living. Hence, using Reversal Theory to understand the pattern of bipolar variations of motivational factors may help to design therapy programs to improve the motivation of the patients on top of general rehabilitation programs. This study aims to analyze the general activity motivation of clients with stroke and explore their difference with the healthy subjects. The relationship among motivation, mental wellbeing and community integration of this population would also be explored

## 2. Methodology

*2.1 Participants*

115 subjects including 30 clients with stroke were recruited consecutively from the outpatients admitted to occupational therapy unit. 85 normal subjects were recruited from hospital staff and members of an elderly center in the community. They reported no active major disease or injuries in past 10 years. Other selection criteria were those who can read and write traditional Chinese and without any diagnoses of cognitive or psychotic problems.

*2.2 Instrumentation*

The Chinese version of General Activity Motivation Measure (GAMM) is cross-culturally adapted from the source English version (Caro et al., 2009) and validated locally (Ng et al., 2015). It is a self-reported measurement comprising 13 items using Likert-type response of 1-5 from 1 = Not

important to 5 = Very important. The items were preceded by the following question: "how important is it for you to…?" Item content was as follows: 1) put your skills to use on a regular basis, 2) keep a flexible schedule, 3) contribute to the community, 4) receive appreciation from other people for what you do, 5) avoid taking on new responsibilities, 6) be free to do the things that you enjoy, 7) make new friends, 8) do things at your own pace, 9) have interesting new experiences, 10) get out of the house regularly, 11) choose the people with whom you associate, 12) feel that you have accomplished something every day, and 13) find ways to save money. The higher the score, the more motivated is the scorer in general activity. The Chinese version showed comparable Cronbach's Alpha of 0.86 to the original version. Good test-retest reliability was shown ($r = 0.587$; $p = 0.005$).

The Community Integration Questionnaire (CIQ) is validated in Chinese for acquired brain injuries population (Chan, 1999). It is usually completed by in-person or phone interview with the individual being assessed. The basis for scoring is primarily frequency of performing activities or roles, with secondary weight given to whether or not activities are done jointly with others, and the nature of these other persons. The CIQ consists of a total of 15 questions range from 0 to 29. A high score indicates greater integration and activity participation. The CIQ can be further divided into three sub-scores including Home (10); Socialization (12); and Education, Vocational or other Productive activities outside the home (7) (Dijkers, 2000). This is used in this research being guided by the hypothesis that participation in an activity is most likely when motivation is high and perceived barriers are low.

The Chinese Short Warwick Edinburgh Mental Wellbeing Scale (SWEMWBS) is an ordinal scale comprising 7 positively phrased Likert-style items. Items cover a range of aspects of mental wellbeing including many which will be familiar from other well-known scales. Responses in the form of a Likert scale comprise "None of the above", "Rarely", "Some of the time", "Often" and "All of the time". Scores ranges from 7 to 35, with a higher score reflecting a higher level of mental wellbeing. Internal reliability coefficient (Cronbach's Alpha) for Chinese SWEMWBS was 0.89 (Ng et al., 2013). Good test-retest reliability was shown.

*2.3 Data Collection*

The participants were recruited and completed a set of forms including the consent form, database form, CIQ, GAMM and SWEMWBS. The normal subjects were invited by a letter containing information of the study including consent form and return to study center after self-completion.

*2.4 Data Analysis*

The descriptive statistics of the sample population were tabulated. Relationships among variables were assessed using a Spearman's rank correlation with $p < 0.05$ significant value adopted in this study. Independent Samples Tests was used to show variations between patient and normal groups. Factor analysis was utilized to explore the internal structure of the measure of motivation and differentiate difference between groups. Regression analysis is performed to explore the predictive power of variables towards community integration. SPSS 22.0 version is used.

## 3. Results

### *3.1 Demographics*

Out of 115 participants, 30 (26%) were clients with stroke and 85 normal subjects. Among the stroke clients 11 were female (37%) and in the normal group 57 (67%) were female. Their age ranged from 21 to 80 (Mean 50.34; SD 17.26) with no significant difference among the two groups ($p < 0.05$). Fifty-seven (49.5%) cases were at primary level; 40 (34.8%) were educated up to secondary level and 16 (15.7%) were at tertiary level. At the time of study, 16 (14.2%) were unemployed, while 52 (46%) are working as fulltime, 11 (9.7%) of them were housewife and 34 (30.1%) were retirees and/or regular volunteer. Fifteen (13%) of them lived alone and 100 (87%) cases were living with family. The 30 participants with stroke were suffering from cerebral vascular accident. One case had history of brain tumor operated and two cases had other chronic neurological diseases. The post-onset period of disease ranged from 1 year to 10 years (Mean 4.16; SD 5.107). Ten of them reported once readmissions to hospital after stroke. All of them reached independent level in basic self- care activities.

**Table 1. Demographics of all Participants (N = 115)**

| | | Stroke Gp N = 30 | Normal Gp N = 85 | Stroke Gp N = 30 | | Normal Gp N = 85 | |
|---|---|---|---|---|---|---|---|
| Characteristics | | n (%) | n (%) | Mean | SD | Mean | SD |
| Sex | Female | 10 (33) | 57 (67) | | | | |
| | Male | 20 (67) | 28 (33) | | | | |
| Marital status | Divorced | 1 (3) | 3 (4) | | | | |
| | Married | 15 (50) | 45 (53) | | | | |
| | Single | 8 (27) | 32 (38) | | | | |
| | Widow | 6 (20) | 5 (5) | | | | |
| Work | Full time work | 7 (23) | 19 (22) | | | | |
| | Full time student | 8 (27) | 0 | | | | |
| | Housewife | 3 (10) | 8 (9) | | | | |
| | Retired/volunteer | 9 (30) | 43 (51) | | | | |
| | Unemployed | 3 (10) | 15 (18) | | | | |
| Living | Alone | 2 (7) | 13 (15) | | | | |
| Age | | | | 52.54 | 16.19 | 49.61 | 17.63 |
| Education | Nil | 1 (3) | 0 | | | | |
| | Primary | 6 (20) | 9 (11) | | | | |
| | Secondary | 12 (40) | 28 (33) | | | | |
| | Tertiary | 11 (37) | 48 (56) | | | | |
| Years with | | | | 4.16 | 5.11 | | |

| | | |
|---|---|---|
| chronic disease | | |
| No of admission | 1.44 | 2.15 |

*3.2 Relationship of Motivation and Community Integration*

In GAMM scale, the total sample-mean was 49.16 (SD 6.58). The higher score belonged to the normal group (Mean 50.09, SD 5.79) and was significantly different from the "stroke" group (Mean 46.32 SD 8.01) in Independent Samples Test ($p = 0.008$). GAMM was found correlated negatively with age, but positively with years of education, mental well-being (SWEMWBS) and Community Integration (CIQ) including home (CIQ-H), social (CIQ-S) and productivity (CIQ-P) sub-scores ($p < 0.05$). Within the sample, tertiary education group revealed a higher GAMM score (Mean 76.61; SD 9.79) than the primary education group (Mean 70.14; SD 14.06). Chronicity of the disease only correlated with CIQ-H & CIQ-S, but not any other measures in our sample.

General Activity Motivation (GAMM) was found correlated positively with the home, social and productive scores of community Integration Questionnaire (CIQ) and the Mental Wellbeing Measure (SWEMWBS) in a significant manner ($p < 0.05$). Forward stepwise regression analysis was performed for the "stroke" group to determine variables for successful community integration. Using CIQ total score as target, with years of education controlled, the only item under GAMM *(9) Have interesting new experiences* was the significant predictor ($R = 0.597$; $F = 14.383$; Sig. $= 0.001$). To repeat the same model of regression for the "normal" group only, no predictors remained as significant. Hence, it was obvious that our stroke clients were motivated by different factors from the normal persons in community integration.

**Table 2. Spearman's Rho Correlation for Variables (N = 115)**

| | Age | Diagnosis | Education | SWEMWBS | CGAMM | CIQ total |
|---|---|---|---|---|---|---|
| Age | | | | | | |
| Diagnosis | -.021 | | | | | |
| Education | -.538** | .234* | | | | |
| SWEMWBS | -.009 | .232* | .169 | | | |
| GAMM | -.213* | .188* | .280** | .418** | | |
| CIQ total | -.450** | .664** | .490** | .366** | .308** | |

*$p < 0.05$; **$p < 0.01$.

**Table 3. Independent Sample T Tests for Mean Scores of SWEMWBS, CGAMM & CIQ (N = 115)**

| Diagnosis | Stroke N = 30 | Normal N = 85 | TOTAL N = 115 | t | Sig. |
|---|---|---|---|---|---|
| | Mean (SD) | Mean (SD) | Mean (SD) | | |
| SWEMWBS | 24.71 (5.32) | 27.26 (3.64) | 26.63 (4.24) | -2.356 | 0.024 |
| GAMM | 46.32 (8.00) | 50.09 (5.79) | 49.16 (6.58) | -2.706 | 0.008 |
| CIQ-total | 13.64 (5.60) | 21.27 (3.58) | 18.34 (5.60) | -6.956 | 0.000 |
| CIQ home | 4.04 (2.60) | 7.04 (2.95) | 5.89 (3.17) | -4.424 | 0.000 |
| CIQ social | 6.36 (1.85) | 8.20 (1.98) | 7.49 (2.12) | -3.958 | 0.000 |
| CIQ productivity | 3.37 (2.19) | 6.02 (1.18) | 5.03 (2.07) | -5.817 | 0.000 |

*3.3 Motivational Dominance and Reversals Analysis*

Principal component analysis of general activity motivation using Varimax with Kaiser Normalization identified four factors in the "normal" group (62.78% variance; Eigenvalues > 1) that corresponded well with the four domains in Reversal Theory namely Means-end, Transaction, Relationship, Rules. The First Component included item 1 to item 4 and also item 11 & 12 that reflected the Telic State of "Means-end" domain. It revealed the subjects were motivated by serious, goal and future directed to make success. Component Two includes item 6, 8 corresponding to the motivation based on self-oriented state of Relationship domain. Component Three with items 7, 9 & 10 also depicted motivation coming from Transaction domain but more on paratelic side. The fourth component which was similar to the "stroke" group, included item 5 & 13 under Rules domain concerning "money" and "duties". Hence, the normal subjects were motivated by goal directed, self-oriented, achievement and conforming to rules and societal expectations.

In the "stroke" group, the picture was quite different although the same 4 factors were still being identified (70% variance; Eigenvalues > 1). The items importance under each component were different from the "normal" group. The first component with items *(6) Be free to do the things that you enjoy, (9) Have interesting new experiences, (10) Get out of the house regularly, (11) Choose the people with whom you associate, (12) Feel that you have accomplished something every day* described the "Means-ends" domain where motivation came from experiencing the process and focus on playful side. The second component with items *(1) Put your skills to use on a regular basis, (8) Do things at your own pace, (13) Find ways to save money* corresponded to "Transaction" domain where motives based on mastery state, value strength and competitive. The third component with items *(2) Keep a flexible schedule, (3) Contribute to your community, (4) Receive appreciation from other people for what you do, (7) Make new friends* corresponded to the "Relationship" domain by focusing on and identifying with others. The fourth component was the only item *(5) Avoid taking on new*

*responsibilities* which demonstrates Negativistic state of "Rules" domain where motives came from rebellious and non-conforming to rules or roles. In summary, when compared to the normal group, stroke clients were motivated from process with experience-oriented, others-focus, strength-based and non-conforming. Besides, the priority of motivational domains, i.e., motivational dominance also changed with "Relationship" placed lower than "Transaction" domain. The difficulties of maintaining relationships with previous social circles might be the worries of our clients after stroke.

**Table 4. Loadings of the GAMM Items in Factor Analysis in Stroke (N = 30)**

| Items | Means-ends | Transaction | Relationship | Rules |
|---|---|---|---|---|
| Use of skill | .089 | .824 | .005 | .179 |
| Flexi schedule | .223 | -.108 | .827 | .270 |
| Contribute | .377 | .351 | .593 | -.203 |
| Being appreciated | .000 | .490 | .517 | .395 |
| Avoid new responsibilities | .037 | .110 | .084 | .776 |
| Free to do enjoy things | .562 | .255 | .177 | -.440 |
| Make new friends | .155 | .579 | .646 | -.169 |
| Do things own pace | .139 | .755 | .075 | -.385 |
| Interesting new experience | .770 | .000 | .435 | -.054 |
| Out of house regularly | .807 | .244 | -.081 | .329 |
| Choose companion | .602 | .011 | .135 | .372 |
| Feel accomplished everyday | .841 | .148 | .204 | -.252 |
| Find ways to save money | .166 | .578 | .155 | .340 |

## 4. Discussion

Instead of viewing global activity motivation as a single construct, it was proven that it consisted of a series of related but independent dimensions (Caro et al., 2010). Our study validated the 4-factor structure of GAMM. It was coherent to the four domains under Reversal Theory (Apter, 1982). The results also revealed that when compared to the normal group, stroke clients were motivated by reversed poles of each motivation domain. The clients with stroke focused on the process with experience-oriented, others-focus, strength-based and non-conforming. Current evidence echoed an important aspect of Reversal Theory as the theory emphasized that individuals regularly switch between opposing motivational states e.g., serious (Telic) to playful (Paratelic) state. These reversals were induced by three reversal agents: environmental events, frustration at not meeting current motivational needs, and satiation of time spent in one state. Change in Priorities of motivational dominance could then explained by the emotional and psychological consequences of Stroke and resultant disabilities. It was evidenced from the results that reversals between domains priority as well

as reversals between poles of each domain happened when a person suffered from stroke disease.

Although different persons reacted differently to their deficits in bodily functions, it was not surprising that when persons with chronic disease, especially diseases that resulted with disabilities, e.g., Stroke, were frustrated in meeting their motivational needs of quick recovery. They would switch from "conforming" and adhering to treatment to later "rebellious" due to perceived pain and failure experiences in daily living. They would transit between "mastery" to "sympathy" to deal with daily life demands and personal expectations. It called for our attention on the possibilities to find effective motivators from our clients during therapy. We have to widen our views that apart from regaining physical functions, stroke clients can be motivated through other areas, especially when their functional gains reached plateau. From our analysis, to develop chances of interesting new experiences, feel accomplishment every day, enable them to get out of house regularly and allow them to do the things that they can enjoy at their own pace are the powerful motivators for them to reintegrate into community living.

We hypothesized that people have internalized motivation to maximize their status on health dimensions including, mental, social & cognitive health especially when they encountered barriers in physical health (Rowe & Kahn, 1998; Ratchford & Regena, 2005). This echoed with our study results that the motivational dominance switched to "self-reliance focused" and "values process, passion and fun" among the clients with stroke. The results from regression analysis also supported the postulation that the importance of motivational domains was different between normal and disease group. Hence, among those with stroke who stuck in the "serious, conforming and mastery state" in their motivational dominance found themselves highly frustrated. They would no longer be satisfied with the health conditions changed. This could explain the prevalence of emotion problems in quite many of stroke population. Their acceptance of deteriorated functioning might not be easily compromised. Rehabilitation professionals should identify early signs of failure in reversing their motivational dominance to a positive way. Routine assessments in Motivation or Subjective Mental Wellbeing might be an essential part to add to our existing rehabilitation programs.

*4.1 Limitations*

This study had several limitations. The sample was small and localized that the generalization of the results to the whole population with stroke needs further studies. The sequence of testing was not randomized and may confound results with order effects.

## 5. Conclusion

This study revealed that Reversal Theory was useful to explain motivational changes among clients with stroke. Reversals between domains as well as reversals between poles of each domain happened when a person suffered from stroke. To develop chances of new interesting experiences and feel accomplishment every day, enable them to get out of house regularly and allow them to do the things that they can enjoy at their own pace were the possible motivators for them to achieve reintegration

into community living.

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**Appendix 1. Summary of Motivational States under Reversal Theory**

| | | | |
|---|---|---|---|
| **Serious state**<br>**Goal and future oriented** | **Conformist state**<br>**Maintaining rules and conforming** | **Mastery state**<br>**Competitive, value strength and control** | **Self state**<br>**Values self-reliance and own needs** |
| **MEANS-ENDS**<br>**Does motivation come from achieving the goals or experiencing the process?** | **RULES**<br>**Are rules, traditions, and expectations supportive or restrictive?** | **TRANSACTIONS**<br>**Are motives based in power and control or in care and emotional support?** | **RELATIONSHIPS**<br>**Are you motivated by fulfilling your own needs or another's?** |
| **Playful state**<br>**Spontaneous, now orientation** | **Negativistic state**<br>Rebellious and innovative | **Sympathy state**<br>Cooperative, value compassion | **Other state**<br>Focusing on and identifying with others |