

Factors for Habit Formation of Physical Activity

Yoongu Lee

Sangmyung University, Korea

Yong-Jin Yoon*

Yonsei University, Korea

Sibak Sung

Florida State University, USA

The guideline for physical activity is being established as an important health habits for preventing and managing several chronic diseases. This health behavior can prevent the following diseases in various aspects. Diabetes and obesity prevention through weight control, cardiovascular disease as hypertension and coronary heart disease, cancer, pulmonary disease, psychological disorder as anxiety and depression, and musculoskeletal disorder as back pain and osteoarthritis are problems that can be resolved at preventive level through exercise. However, lack of physical activity causes a lot of pain by causing diseases listed above.

However, if it is accompanied by habits related to physical activity, it can be practiced even if the intention of physical activity is insufficient. Therefore, this study sought to help the implementation of health behaviors by exploring the factors needed to form physical activity habit. When four factors(rewards, consistency, behavioral complexity, environmental cues) have been made in a complementary combination it would expect the formation of habit.

Key word : physical activity, exercise habit, rewards, consistency, behavioral complexity, environmental cues

Four antecedent habit model

Most precedent studies on health behavior have been conducted in conscious aspect. The process has contributed significantly in understanding the health behavior process. However, unexplainable phenomenon in conscious aspect appeared. That created questions in intention-behavior gap. According to the intention-behavior gap hypothesis, having high intention to implement a certain

* yoonyj@yonsei.ac.kr

The current paper is revised version of Yoongu Lee's doctoral dissertation.

behavior is not a sufficient prerequisite that can lead to behavior. According to Rhodes and de Bruijn (2013), habit is one of the components that can improve explanation in intention-behavior gap. Furthermore, according to a recent meta-analysis, habit is showing correlation of $r=.43$ with behavior and this is a similar level as a correlation of intention and behavior (Gardner et al., 2011).

It is difficult to suppress habit in a situation where intention creates a conflict on whether to conduct a certain behavior. Meaning, if a habit is formed, the power works stronger than intention and generates behavior. This basis is being supported by studies on habit and physical activity. According to Rebar, Elavsky, Maher, Doerksen, and Conroy (2014) who research physical activity and habit, the power of habit makes positive effect on participation in physical activity when people have weaker intention than usual. On the other hand, habit is unrelated to physical activity when people have general or stronger intention than usual.

Initiation and maintenance of a new behavior are important for a habit to be developed. Next, promotion of change and repetition for intention to be led to behavior is required (Lally & Gardner, 2013). According to a study by Sheeran (2002), the percentage of having intention for health-related behavior that leads directly to behavior even when there is intention for health-related behavior is only 47%. For this reason, several factors play an important role for intention to be led to behavior. The first example is the action planning. This began to receive attention from Health Action Process Approach, a useful theory in understanding the phenomenon of intention-behavior gap. Action planning signifies a specific planning of when, where, and how to behave. Moreover, Webb and Sheeran (2006) said planning for ways to overcome obstructive factors that a person faces during the process of accomplishing intention and achieving goal is also an important strategy that connects the intention-behavior gap. The coping planning plays a role of increasing the performance of various health behaviors (Sniehotta, Scholz, & Schwarzer, 2006). Initiation of behavior needs to be made for repetitive behavior to be conducted. Whereas negative effect causes behavioral disruption when attempting long-term behavior changes, positive effect strengthens the improvement of commitment and effort for changes. In other words, when a person experiences positive emotion, satisfaction for the experience increases and this leads to the next behavior. In long-term point of view, forming habit is one of the most useful ways to continue behavior in performing health behavior. Therefore, it is very important to develop a new desirable habit in terms of configuring health behavior-related intervention.

In conclusion, researches on the impact of habit are being conducted, but there is still a lack of research on how habit gets formed. Therefore, review on habit model with antecedent variables of habit formation is as follows.

1. Rewards

Habits form by strengthening through rewards, and positive emotion or satisfaction with a certain behavior need to be consistent. Again, reward can be classified into extrinsic rewards as financial incentive and intrinsic rewards as joy and satisfaction. Providing external rewards for each behavior as financial reward interrupts the formation process of habit (Lally & Gardner, 2013). When extrinsic rewards get stronger, intrinsic motivation for behavioral performance decreases. Meaning, not performing behavior with intrinsic motivation and expect monetary reward for behavior brings problem. Moreover, habit gets characterized by sustained performance when there is no type of reward as intrinsic motivation (Dickinson, 1985).

One of the ways to experience intrinsic reward include personal satisfaction for behavior. For instance, it is difficult to participate in sports again if it was too difficult, found no joy in it, and had bad experience. However, feeling satisfaction or accomplishment when participated in sports will help a person to participate again to feel the feeling once again. Specially, many participants give up halfway because it is difficult to experience physical changes or weight loss in a short period of time, but can expect persistence of behavior through circular loop when experience of intrinsic reward is well formed.

2. Consistency

Consistency is the most powerful element in habit formation, and refers to consistent performance of action (Kaushal & Rhodes, 2015). Also, habit forms by continuous and repetitive behavior of a certain cue. Responding to the same cue with various behaviors can decrease the chance of making habit, and this is because mental cue-response association can be weakened by response other than cue (Wood & Neal, 2007). Therefore, it is important to select a new cue irrelevant to a new cue which is associated with different behavior already (Lally & Gardner, 2013). Habit gets recognized by behaviors such as patterned action (Grove & Zillich, 2003) and repeated action under stable contexts (Ouellette & Wood, 1998).

3. Behavioral complexity

According to a study by Wood, Quinn, and Kashy (2002), when behavior is repeated in a stable environment, thoughts related to the behavior did not appear much whereas thoughts about behavior increased in complex situation. Meaning, simple behavior is more likely and easier to become habitualized because the information processing process is simpler than complex behavior.

Conducting simple act is very important in practicing behavior. This is because it is difficult to start acting when behavior is difficult. For example, when a person feels it is difficult to do

some behavior, this idea itself prevents execution and stops the person from even getting started. Therefore, it is necessary to begin with something feasible and easily accessible even when there is a big goal. It would not matter if you are a person with strong willpower, but majority of people feel it is difficult to keep up a new behavior. It is helpful to start with something that can put into action at first because there is power in willpower as well, but can approach more difficult behavior without much repulsion because willpower grows stronger when the behavior becomes familiar. In other words, it is the confidence that one can control than having difficulty in practicing behavior. As explained, Behavioral complexity is being established as an important influencing factor of habit formation.

4. Environmental cues

Finding a proper cue that can cause behavior makes effect on habit formation. Having a sports facility center or a facility where people can exercise near their home will work as an environment cue and help them to participate in action (Rhodes, Courneya, Blanchard, & Plotnikoff, 2007). Formation of habit accelerates when cue frequently contacts sight, hearing, touch, smell, and taste that induce behavior with a situation of formed habits. Cue is the stage of stimulating desire before behavior takes place. For example, a person whose goal is to lose weight placing a picture of a person with nice body where they can see easily and putting into action by getting stimulated by the picture is one of the ways of using cue. This does not only include visual cue, but emotional cue as well. Just like you need to eat lunch at noon and acting consistently as eating meal at same time everyday are also the cases of using time as cue.

Precedent studies on habit and physical activity

Maher and Conroy (2015) used the 2 by 2 design to investigate how action planning makes effect on physical activity according to the habit strength on 195 university students. According to this study, it was identified that a group with action planning for physical activity showed higher physical activity level than the group without when habit strength was weak, but in contrast, a group without action planning showed higher physical activity level than the group with action planning when habit strength was strong. Meaning, this represents that people need to have a plan for physical activity when habit is not sufficiently formed, and can participate more in physical activity without having to make a plan for exercise when habits are formed. Through this study, it was identified that action planning is a helpful behavior change technique to people who lack habits for physical activity.

Rebar et al. (2014) asked 128 university students to record their physical activity habit strength and daily physical activity intention for 14 days. They were asked to wear an accelerometer to objectively measure the amount of physical activity. According to the result of this study, habit strength worked positively on physical activity when intention for physical activity was lower than usual. On the other hand, it was identified that habit strength is not related with physical activity on days with stronger intention for physical activity. Collectively, the results suggest that physical active mutually affects by controlled process as intention and automatic process as habit. Intention for physical activity is different every day because people's mood and emotion are also different every day. However, people can participate in physical activity without much effort even on days with low intention when habits are formed that habit is playing a very important role in regular participation of physical activity.

According to a study by van Bree et al. (2013), intention, action planning, and physical activity are being suggested as the determinants of formation of physical activity habits. However, the study was conducted with a question on how these factors make effect on habit formation. This study investigated how action planning and physical activity work in intention-habit relationship. It was identified that physical activity mediate between intention and habit, and action planning does not. As a result, intention makes effect on habit when it leads to physical activity and occurs repetitively.

Gardner and Lally (2013) stated that intrinsically motivated physical activity is required in habit formation and needs inherent satisfaction from behavior. This study investigated a relationship between self-determination, past behavior, and habit strength on 192 people. Habit gets predicted by interaction effect of past behavior and self-determined regulation, and past behavior made stronger effect on habit strength when it is automatically synchronized. Habit strength significantly improves as the frequency of past behavior increases when a person participates in physical activity with high autonomy, but cannot expect significant change in habit strength even if behavior frequency increases in a state of lack of autonomy. To conclude, this study indicates an evidence that habit cannot be formed if autonomy is not guaranteed in behavior even if the behavior is conducted repetitively.

A research by Phillips, Chamberland, Hekler, Abrams, and Eisenberg (2016) set up a model that intention and habit mediate a relationship between intrinsic rewards and exercise. Also, they investigated a difference in mediating effect between exercise initiators and maintainer group. As a result, it was identified that habit strength mediates a relationship between intrinsic rewards and exercise for exercise maintainer. For initiators, intention mediated a relationship between intrinsic rewards and exercise. Based on the results, it can be concluded that intrinsic rewards

make effect on intention at the stage of starting exercise, and intrinsic rewards make effect on habit at the stage of keeping up with exercise. In development of physical activity intervention, it would be necessary to focus on preparing opportunities for people at the primary stage of exercise to experience intrinsic rewards and disjunctively different intrinsic rewards at an early stage in maintenance stage.

It was identified that both habit strength and action planning have mediating effect in a relationship between intention and behavior, but de Bruijn, Rhodes, and van Osch (2012) analyzed a relationship between habit strength and action planning because they have never been analyzed at the same time. This study identified that habit strength and action planning have moderating effect in a relationship between intention and exercise when action planning and habit strength are strong. On the other hand, it is difficult for action planning and habit to be led to behavior even when intention increases when they are in low condition. To conclude, it would be necessary to pay more focus on action planning and habit strength when developing exercise intervention to promote physical activity.

References

- de Bruijn, G. J., Rhodes, R. E., & van Osch, L. (2012). Does action planning moderate the intention-habit interaction in the exercise domain? A three-way interaction analysis investigation. *Journal of Behavioral Medicine*, 35(5), 509-519.
- Dickinson, A. (1985). Actions and habits: the development of behavioural autonomy. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 308(1135), 67-78.
- Grove, J. R., & Zillich, I. (2003, January). Conceptualization and measurement of habitual exercise. *In Proceedings of the 38th annual conference of the Australian psychological society* (pp. 88-92).
- Kaushal, N., & Rhodes, R. E. (2015). Exercise habit formation in new gym members: a longitudinal study. *Journal of Behavioral Medicine*, 38(4), 652-663.
- Lally, P., & Gardner, B. (2013). Promoting habit formation. *Health Psychology Review*, 7(sup1), S137-S158.
- Maher, J. P., & Conroy, D. E. (2015). Habit strength moderates the effects of daily action planning prompts on physical activity but not sedentary behavior. *Journal of Sport & Exercise Psychology*, 37(1), 97-107.
- Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: the multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*, 124(1), 54-74.

- Phillips, L. A., Chamberland, P. É., Hekler, E. B., Abrams, J., & Eisenberg, M. H. (2016). Intrinsic rewards predict exercise via behavioral intentions for initiators but via habit strength for maintainers. *Sport, Exercise, and Performance Psychology*, 5(4), 352-364.
- Rebar, A. L., Elavsky, S., Maher, J. P., Doerksen, S. E., & Conroy, D. E. (2014). Habits Predict Physical Activity on Days When Intentions Are Weak. *Journal of Sport & Exercise Psychology*, 36(2), 157-165.
- Rhodes, R. E., & de Bruijn, G. J. (2013). How big is the physical activity intention-behaviour gap? A meta-analysis using the action control framework. *British Journal of Health Psychology*, 18(2), 296-309.
- Rhodes, R. E., Courneya, K. S., Blanchard, C. M., & Plotnikoff, R. C. (2007). Prediction of leisure-time walking: an integration of social cognitive, perceived environmental, and personality factors. *International Journal of Behavioral Nutrition and Physical Activity*, 4(1), 1-11.
- Sheeran, P. (2002). Intention-behavior relations: A conceptual and empirical review. *European Review of Social Psychology*, 12(1), 1-36.
- Snihotta, F. F., Scholz, U., & Schwarzer, R. (2006). Action plans and coping plans for physical exercise: A longitudinal intervention study in cardiac rehabilitation. *British Journal of Health Psychology*, 11(1), 23-37.
- van Bree, R. J., van Stralen, M. M., Bolman, C., Mudde, A. N., de Vries, H., & Lechner, L. (2013). Habit as moderator of the intention-physical activity relationship in older adults: a longitudinal study. *Psychology & Health*, 28(5), 514-532.
- Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, 132(2), 249-268.
- Wood, W., & Neal, D. T. (2007). A new look at habits and the habit-goal interface. *Psychological Review*, 114(4), 843-863.
- Wood, W., Quinn, J. M., & Kashy, D. A. (2002). Habits in everyday life: thought, emotion, and action. *Journal of Personality and Social Psychology*, 83(6), 1281-1297.

Received: November 13, 2017

Reviewed: December, 8, 2017

Accepted: December 22, 2017