Near miss and repeated failure: Understanding the motivation dynamics

Near miss is a special type of failure where one is only slightly behind the goal. It has been verified in both biological and psychological studies that the experience of neat miss can improve people's performance by enhancing their motivation. Yet, after experiencing repeated near misses, people who were motivated at initial gradually realize and confirm their disability in finishing assigned tasks. As a result, repeated experiences of failures may be interpreted as a lack of problem-solving ability and discourage them to try again.

Near miss

A near miss is a type of failure close to success. There has been extensive literature studying neurobiological response and psychological mechanisms of the near miss, supporting the idea that a near miss improves people's motivation (Reid, 1986; Clark et al, 2009; Berger & Pope, 2011; Dymond et al, 2014; Wang, Jones & Wang, 2019). Classic psychological research compares near misses of both games of skill (e.g., shooting) and games of pure chance (e.g., gambling), both of which would increase people's motivation. It is easy to understand that in games of skill, a near miss would give participants helpful feedbacks and indicates that success may be within reach, thus encouraging the players to continue trying. In contrast, there would be no information for participants to increase the chance of winning in gambling since the probability of winning is equal and independent from trials to trials. However, gamblers often behave as if they could change the likelihood of winning (e.g., by choosing family birth as a lottery number). Hence, they would be motivated by regarding the near miss as an encouraging sign (Reid, 1986). Additionally, people's attributional biases - their tendency to overestimate dispositional factors to explain wins and underestimate situational factors - may influence their motivation (Toneatto, 1999). By regarding situational factors as the main reasons for a near miss, people expect that their next trial wouldn't be influenced negatively by these external factors and are encouraged to continue trying with hope.

One fruitful line of research has demonstrated the psychological mechanisms involved in the near-miss response by figuring out that trait-related gambling cognitions influence behavioral and subjective responses (Billieux et al, 2012). Specifically, skill-oriented gambling cognitions (i.e., the performance is determined by internal factors like reappraisal of losses and ability) predict a higher desire and motivation to play after a near miss than ritual-oriented gambling cognitions (i.e., the performance is determined by external factors like luck and superstitions). In skill-oriented cognitions, people believe that skills to increase the likelihood of winning may be acquired, which encourage them persist in the current task. For example, people believing in that slight losses will provide them with a learning experience and help them win later would be more likely to keep on trying after a near miss (Billieux et al, 2012). Since gambling is often mistakenly regarded as a skill-based game by participants (Reid, 1986), gambling near misses would also foster the illusion of control, thus increasing people's motivation.

Moreover, recent brain experiments (Clark et al, 2009; Dymond et al, 2014) compare people's neural responses to near-miss and far-miss outcomes by classic slot machine tasks. Biologically, they identify that a near miss enhances motivation by recruiting win-related brain regions such as the ventral striatum.

Numerous evidence has shown that a near miss would exert a positive effect on people's motivation, which has been empirically supported in various fields. In competition, opponents' performance is regarded as a benchmark, and people evaluate their performance relative to their opponents. Those who are slightly behind would work harder, hence increasing their winning probability in the next competition, than those who are ahead according to loss aversion theory (Kahneman & Tversky 1979; Berger & Pope, 2011). Moreover, a near miss not only increases people's desire for continued play on the same task, but also enhances motivation on unrelated and desirable tasks, which leads to a generally more positive motivation state (Wadhwa & Kim, 2015). As for a long-time career, people who endure an early-career setback appear to have a better performance than those who persevere (Wang, Jones & Wang, 2019).

Repeated failures

Repeated failures (Yin et al, 2019) refer to people's repeated attempts at a goal that fails, exerting negative effects on individuals both psychologically and biologically. Specifically, repeated failures may increase people's anxiety, depression, and anger, where perfectionists are more vulnerable (Stoeber et al, 2014). Besides, multiple biological studies on the repeated social defeat of male NMRI mice have revealed changes in the circadian rhythms of temperature and locomotor activity induced by multiple-defeat experiences (i.e., a long-term decrease in the amplitude of circadian rhythms of heart rate and core body temperature) (Keeney, Hogg & Marsden, 2001; Tornatzky & Miczek, 1993).

In addition, the egotism explanation of helplessness (Frankel & Snyder, 1978) argues that repeated failures are the critical determinant of helplessness symptoms. When failing repeatedly, people interpret the failures as a lack of problem-solving ability. Under this circumstance where people's self-esteem is threatened, they tend to engage in a least-effort strategy, thus impairing their performance. Though there are some debates on whether repeated failures are a source of learned helplessness, there is no doubt that repeated failures exert a dreadfully negative influence on individuals' motivations (Kofta & Sedek, 1989).

As a special case of repeated failure, repeated near misses are repeated failed attempts that are all close to success. In skill-oriented cognitions, people believe that skills may be acquired to improve their performance and increase the likelihood of winning (Billieux et al, 2012). However, multiple near-miss experiences suggest no improvement during the process. Stuck in the same disadvantageous circumstances, people begin to doubt their ability and lose confidence. In other words, people gradually attribute their failures to internal factors and believe that they can't change the outcomes. Therefore, to protect their self-esteem and self-image, people are

demotivated and unwilling to retry the tasks regarded as a noncontingent failure (Frankel & Snyder, 1978).

Reference:

Reid, R. L. (1986). The psychology of the near miss. *Journal of gambling behavior, 2*(1), 32-39.

Clark, L., Lawrence, A. J., Astley-Jones, F., & Gray, N. (2009). Gambling near-misses enhance motivation to gamble and recruit win-related brain circuitry. *Neuron, 61*(3), 481-490.

Berger, J., & Pope, D. (2011). Can losing lead to winning? *Management Science, 57*(5), 817-827.

Dymond, S., Lawrence, N. S., Dunkley, B. T., Yuen, K. S., Hinton, E. C., Dixon, M. R., ... & Singh, K. D. (2014). Almost winning: Induced MEG theta power in insula and orbitofrontal cortex increases during gambling near-misses and is associated with BOLD signal and gambling severity. *Neuroimage, 91*, 210-219.

Wang, Y., Jones, B. F., & Wang, D. (2019). Early-career setback and future career impact. *Nature communications, 10*(1), 1-10.

Toneatto, T. (1999). Cognitive psychopathology of problem gambling. *Substance use & misuse, 34*(11), 1593-1604.

Billieux, J., Van der Linden, M., Khazaal, Y., Zullino, D., & Clark, L. (2012). Trait gambling cognitions predict near‐miss experiences and persistence in laboratory slot machine gambling. *British Journal of Psychology, 103*(3), 412-427.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*(2), 363-391.

Wadhwa, M., & Kim, J. C. (2015). Can a near win kindle motivation? The impact of nearly winning on motivation for unrelated rewards. *Psychological science, 26*(6), 701-708.

Yin, Y., Wang, Y., Evans, J. A., & Wang, D. (2019). Quantifying the dynamics of failure across science, startups and security. *Nature, 575*(7781), 190-194.

Stoeber, J., Schneider, N., Hussain, R., & Matthews, K. (2014). Perfectionism and negative affect after repeated failure. *Journal of Individual Differences, 35*, 87-94.

Keeney, A. J., Hogg, S., & Marsden, C. A. (2001). Alterations in core body temperature, locomotor activity, and corticosterone following acute and repeated social defeat of male NMRI mice. *Physiology & behavior, 74*(1-2), 177-184.

Tornatzky, W., & Miczek, K. A. (1993). Long-term impairment of autonomic circadian rhythms after brief intermittent social stress. *Physiology & behavior, 53*(5), 983-993.

Frankel, A., & Snyder, M. L. (1978). Poor performance following unsolvable problems: Learned helplessness or egotism? *Journal of Personality and Social Psychology, 36*(12), 1415.

Kofta, M., & Sędek, G. (1989). Repeated failure: A source of helplessness or a factor irrelevant to its emergence?. *Journal of Experimental Psychology: General, 118*(1), 3.

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