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The Ebb and Flow of Performance Feedback

Chris Thompson
Butler University

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Read, approved, and signed by:
Thesis adviser(s): Alison O'Malley  
Date: 4/28/14

Reader(s):  
Date: 4/13/14

Certified by: Judith Nancy Marsh  
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The Ebb and Flow of Performance Feedback

A Thesis
Presented to the Department of Psychology
College of Liberal Arts and Sciences
of
Butler University

Chris Thompson
April 26, 2014
Abstract

Researchers have suggested differences between mindfulness and flow in their attentional breadth or focus. Being high or low in attentional breadth is more desirable depending on the situation or the focal task. I sought to better understand mindfulness and flow by seeing how they lessen negative emotional reactions to negative feedback, a process which can hinder performance improvement. In a laboratory experiment 92 Butler University undergraduate students underwent a Tetris performance task; where all participants received the same negative feedback. Measuring for emotional reactions and interest after the negative feedback I did not find significant findings in light of my manipulations, but I reveal data that were trending in a manner resembling my anticipated findings.
The Ebb and Flow of Performance Feedback

Whether at work, in school, or on a team, feedback is a necessary part of performance. Negative feedback helps people become aware of areas where they are not performing up to standards and change their behaviors to address performance-goal discrepancies. However, negative feedback can have adverse effects and may instead cause negative emotional reactions, perceptions of unfairness, and rejection of the feedback (e.g., Anseel & Lievens, 2006; Cianci, Klein, & Seijts, 2010). My work stems from literature demonstrating the efficacy of mindfulness-based interventions in creating resilience and sustained well being in people (e.g., Kabat-Zinn, 2003; Chen, Thompson, Toomey, & O’Malley, 2012). By targeting mindfulness, a psychological state promoting one’s attention on their current experience, alongside flow, a high level of engagement in an optimally difficult task that elicits great concentration and sense of control, I hope to lessen people’s negative reactions to negative feedback.

Mindfulness: An Overview

According to Kabat-Zinn (1994), mindfulness is defined as the nonjudgmental focus of one’s attention on the experience that occurs in the present moment. Cottraux (2007) conceptualized mindfulness as a mental state resulting from voluntarily focusing one’s attention on one’s present experience in its sensorial, mental, cognitive and emotional aspects in a non-judgmental way. With roots tied deeply into Eastern cultures, mindfulness meditation practices have been said to help people become “alive” to the present moment (Hanh, 1976, p. 11), attuned to their internal processes and states (Epstein, 1995), and physically and mentally healthier (Thondup, 1996). However similar meditation and mindfulness have become, mindfulness is
strictly a psychological term which does not always call for meditation to elicit the mindful state (Brown & Ryan, 2003).

Before the psychological community accepted it, mindfulness was largely overlooked in western culture. Its deep ties to eastern philosophies and religions shrouded this psychological state of mind in mysticism instead of science. As previously acknowledged, traditionally the cultivation of mindfulness has been through meditative practices (Conze, 1956). However, in the Western adoption of mindfulness, we have created several adaptations to the historic ways such as mindfulness-based stress reduction (Kabat-Zinn, 1990) and mindfulness-based cognitive therapy (Segal, Williams, & Teasdale, 2002), which incorporate meditation as a portion of these different programs. In the recent adoption of mindfulness techniques, mindfulness treatments have been used in the reduction of depression and anxiety in individuals (Kabat-Zinn, 1982; Teasdale et al., 2000), along with tendencies to increase physical and mental health, interpersonal relationship quality, and behavioral regulation (Brown, Ryan, & Creswell, 2007).

In recent work, colleagues and I used a brief mindfulness intervention. The intervention helped participants focus on their breathing for 15 minutes and influenced emotional reactions to negative feedback such that participants experienced less intense negative emotions (Chen, Thompson, Toomey, & O’Malley, 2012). This research stemmed from the work of Arch and Craske (2006) who found that a 15-minute mindfulness induction resulted in lower emotional reactions to neutral stimuli than those who were guided under a unfocused breathing exercise. From research such as this I have been able to determine that it does not take months for people to acquire more mindful dispositions toward neutral or even negative stimuli, but can be implemented, for a short time, through focused breathing exercises.
Research in mindfulness has extended to the realm of sport. Recent studies in sport psychology have formed such a relationship between mindfulness and athletic performance (Gardner & Moore, 2004, 2006; Kee & Wang, 2008). Peak performance in sport is driven by mindfulness’ connection to present-moment focus (Jackson & Csikszentmihalyi, 1999). Kee and Wang (2008) found through a cluster analytic approach that athletes who tend to be more mindful are also more likely to experience the flow state, which is described in turn.

**Mindfulness as Related to Flow**

Having full attention focused on any given task will help increase performance, but may be harder to obtain than we think. Allowing outside distractions of future or peripheral events will lead to decreased concentration towards the task at hand, increasing one’s own stimulus field, and decreasing performance. Understanding the need for increased focus, Csikszentmihalyi (1990) identified the benefits of total absorption in the focal task. Flow includes seamless absorption, high-level focus, and complete and effortless absorption in a task that is pleasing. When in a flow state a person is experiencing peak emotions of the highest happiness and fulfillment. Unfortunately, it is not easy to enter a flow state. Csikszentmihalyi (1975) states that individuals must not find the task they are engaging to be too difficult or too easy in accordance with their skill. Further, the task requires clear goals that allow for feedback on progression through the task. Flow is where passion meets abilities.

Flow is both similar to and different from mindfulness. Mindfulness and flow both require absorption into a task, which is a core element of job engagement (Macey & Schneider, 2008). However, where mindfulness necessitates receiving stimulation from all available sources, absorption and flow have a smaller attentional breadth which allows for only stimuli from the task an individual is faced with (Dane, 2011). To elaborate, Bazerman (2006) described
an anecdotal situation in which his absorption in a game of bridge blinded him from the large number of bystanders observing his game. This oblivious behavior is something uncharacteristic of mindfulness which allows for a wide attentional breadth. Along with Bazerman’s story, the same would be true of an athlete unaware of the screaming fans or a musician enveloped in the music rather than the hundreds or thousands of people watching, but somewhere in the middle of peak performance mindfulness and flow meet.

Research by Diaz (2013) suggests that mindfulness and flow may also differ, in a hierarchical fashion, depending on the task. In his music listening task, participants were more highly linked between registering aesthetic responses when in a more mindful state. Therefore, where mindfulness was more linked to responses of feelings or affect, experiences of flow or highly directed concentration on the task, elicited less aesthetic and affective reactions. Those experiencing flow were able to concentrate on the changing of the stimulus (music) where those more mindful experienced emotional changes. This may reveal a difference between cognitive and emotional relevance and the differentiating of flow and mindfulness. In contrast to Diaz’s findings, Key and Wang (2008) found a strong relationship between those high on mindfulness and participants experiencing flow, specifically athletes. The differences between mindfulness and flow may be linked to variations in the type of task at hand.

*Mindfulness and Flow in Feedback*

The way in which mindfulness affects task performance needs deeper investigating (Motowidlo, Borman, & Schmit, 1997). Dane (2011) suggests that mindfulness has two avenues: external and internal. Having a wide external attentional breadth keys a person into the happenings around them, while a wide internal attentional breadth looks toward one’s own thoughts, beliefs, and emotions (Kabat-Zinn, 2005; Nyanaponika, 1972). Wide external
attentional breadth is thought to increase task performance in dynamic task environments wherein individuals are forced to make interdependent decisions in real time (Edwards, 1962; Gonzalez, 2005) and inhibits task performance in static task environments which are more stable and predictable (Edwards, 1962; Nadkarni & Barr, 2008). Wide internal attentional breadth increases task performance when one has a high level of task expertise, and it inhibits task performance when one is a task novice.

Weiss and Cropanzano’s (1996) affective events theory (AET) provides the basic framework for studying emotions, moods, and job satisfaction. AET considers how affective events, or events that elicit any form of emotion, affect attitudes and behavior (Weiss & Cropanzano, 1996). One way to invoke strong emotions in people is through feedback on their task performance. Whether positive or negative, feedback has a way of swaying emotions. Negative feedback helps people become aware of areas where they are not performing up to standards and change their behaviors to address performance-goal discrepancies (Ashford & Cummings, 1983). However, negative feedback can stifle attempts to come to terms with performance change, causing people to retreat from the feedback instead of embracing it (e.g., Anseel & Lievens, 2006; Cianci, Klein, & Seijts, 2010). Negative emotion causes cognitive systems to become conflicted, signaling conditions that confront the status quo and threaten personal goals (Schwarz & Clore, 1996).

All is not lost to negative feedback and emotions; there do exist methods to manage these disruptions. Coping is conceptualized as “cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the recourses of the person” (Lazarus & Folkman, 1984, p.141). Negative emotions elicit psychological and behavioral efforts in the reduction of aversive affects and resolve the conflict that aroused these
emotions. In coping there are two main classes: emotion focused and problem focused, determined by the situation (Lazarus, 1991). Aldwin and Revenson (1987) categorized these strategies as inhibition of action and intrapsychic. It is within an intrapsychic scope where our mindfulness and flow constructs lie, and will function as a preventative measure of coping, rather than reactive.

As mindfulness and flow gather more attention from different areas of western culture (e.g., sport, workplace, education), I hope to help this body of research grow with regards to how mindfulness and flow mitigate emotional reactions to negative feedback. I hypothesized the following:

**Hypothesis 1:** Participants who experience both a brief mindfulness intervention and a flow induction will report less negative emotions from receiving negative feedback after a performance task.

**Hypothesis 2:** Participants who experience higher levels of mindfulness and flow will, in turn, report higher interest in the task.

**Method**

**Participants**

Participants were 97 undergraduate students from Butler University. Five of these participants could not complete the study due to equipment malfunctions. The majority (84%) of the participants were female. Participants were recruited through the use of an online website called Sona Systems. Participants were compensated for their participation by receiving extra credit for the psychology course of their choice.
Procedure

This laboratory study consisted of random assignment to one of four conditions: a control condition, a flow condition, a mindfulness condition, and a condition of priming both mindfulness and flow for the performance task. In the Mindfulness condition, a brief mindfulness recording was played before the task began. In the Flow condition, participants were told that the Tetris task is calibrated to fit their skill level by the computer system. The Mindfulness and Flow condition contained both the mindfulness induction and the calibrated level of difficulty. Lastly, in the control condition participants only played the Tetris game. Participants began the study by completing state affect and feedback orientation questionnaires. Participants then played a computer-based Tetris game, and I measured performance based upon levels completed (Keller & Bless, 2008). After the first performance trial, participants received a bogus negative feedback message stating that the participant scored at the 25th percentile, well below average. Afterward, participants completed measures of flow, emotional reactions to bogus negative feedback and interest. Next, participants engaged in a second performance trial and flow was measured for a second time. Participants then were debriefed by the experimenter. The entire study took about 35 minutes. The procedure is summarized in Figure 1.

Measures

State Affect. From Watson & Clark (1994) this measure looks at the way participants are feeling right at the moment they are answering the 20-item, 5-point Likert scale (1 being “very slightly, or not at all”; 5 being “extremely”).

Emotional Reactions to Performance Feedback. Thayer (1989) developed this 5-item scale to report current emotional state on a 4-point Likert scale. From 1 (definitely feel) to 4 (definitely do not feel), participants indicate the extent to which five adjectives (jittery, intense,
fearful, anxious, and tense) describe their feeling “at this moment.”

**Feedback Orientation.** This measure indicates how participants view feedback in a 24 item 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) adopted from Linderbaum & Levy (2010). A sample item is “I often feel insecure when receiving feedback.”

**Short Dispositional Flow Scale.** Our means of measuring whether or not participants were experience in any sort of flow experience was through this 9-item, 5-point scale (1= never, 5= always). Adopted from Jackson, Eklund, and Martin (2010), an example item includes “the experience is extremely rewarding”.

**Interest.** In order to gather participants’ interest in this study I administered a 4 item Likert type questionnaire (1 = strongly disagree; 6 = strongly agree). An example question consisted of "The subject matter in this study is interesting".

**Results**

Six participants were excluded from data analysis as they were extreme outliers on the Tetris task. Means and descriptive statistics for focal variables are reported in Table 1. Contrary to Hypothesis 1, experimental condition did not affect emotional reactions to negative feedback. A MANOVA revealed that means for high and low activation negative emotional reactions do not significantly differ based upon experimental condition, $F(6, 140) = 1.53, p = .17, \eta^2 = .06$. Although the nonsignificant multivariate statistic precludes interpreting the individual dependent variables, I did find value in looking directly at means per condition for high and low activation emotions. In line with the hypothesis, participants in the flow and mindfulness condition reported experiencing less intense low activation negative emotions relative to the other conditions (see Table 1). At odds with Hypothesis 2, an ANOVA revealed no significant effect on interest when participants experienced a brief mindfulness intervention and a flow induction, $F(3, 71) = .19, p$
Discussion

The underlying qualities of mindfulness and flow have broader implications than the fields of health and sport performance. The goal of this research was to extend previous research on mindfulness and flow into an organizational setting with regards to feedback (Dane, 2011). Specifically, I sought to examine how a brief mindfulness induction and a flow manipulation affected participants’ emotional reactions to negative feedback and interest in the study.

Contrary to the hypothesis, negative emotional reactions to negative feedback were not significantly influenced by the mindfulness and flow interventions. Although I did not find significant differences in emotional reactions to negative feedback, it is nevertheless interesting to entertain the pattern of mean differences. I found that low activation emotions appeared to be more sensitive to the manipulation than high activation emotions. However, these findings may be a byproduct of the performance task. The Tetris task may not have aroused participants at a deep enough level to cause high activation emotions to be impacted.

These findings warrant comparison with Chen et al. (2012) where only the brief mindfulness induction was implemented and succeeded in mitigating negative emotional reactions to negative feedback. Within Chen et al. (2012), the mindfulness intervention was used before an emotional recognition task called “Reading the Minds Eye” where participants were asked to judge the emotions of people only by seeing pictures of their eyes. In my study, participants engaged in a Tetris task to manipulate different formations of physical blocks on a computer screen. The first task is emotionally related to cognition, the second, physically related. From these two differences I can connect that mindfulness, and possibly flow, are more efficiently connected to emotional coping strategies, such as venting (Pearlin & Schooler, 1978).
Through venting people can lessen their focus on the negatively distracting situation and instead focus on the steps to complete the task effectively. By being mindful or in a flow state, distractions are mitigated and goal achievement increases. Where flow was introduced in this current research, we can surmise that entering a state of flow is better suited for physical task performance over emotional performance (Diaz, 2013).

My second hypothesis suggested that participants in the mindfulness and flow conditions will report higher levels of interest, but this was not supported. Looking toward Figure 1, the order of dependent measures may be the reason for these findings. Participants during this portion of the study had just received negative feedback on their performance and evaluated their emotional state towards it. It is likely that having just reflected on ones’ own emotions would cause the participant to report low interest in the study. Furthermore, a computer screen immediately telling a participant how they scored on a percentile scale likely yielded inconsistent results between those believing the feedback to be true and those who did not believe the feedback. Measuring the extent to which participants found the feedback plausible would account for this.

Limitations and Implications for Future Research

This research comes with a number of limitations. First, I struggled to recruit enough participants to reach my goal of 30 participants per condition. My second limitation in conducting the study was the computerized and computer-generated negative feedback component. Each participant encountered the same computer-generated feedback message upon task completion. The authenticity of the feedback is in question here, potentially affecting the way in which participants answered the questionnaires following the feedback. An alternative version of the feedback should be implemented if the study were to be replicated. Perhaps a
different program taking more time before reporting the scores would improve the feedback’s authenticity.

At times during the study participants were forced to pause or even stop the experiment because of malfunctioning equipment. Five participants were excused before they were able to complete the experiment. Furthermore, the computer-based Tetris task necessitated that the experimenter interact with participant during the study; explaining game instructions and rules as well as setting up the game may have created too much interaction between the experimenter and participant. This is hard to control across experimenters. Minor variations in interactions may take the participant out of the mindset of being in an experiment. Since this study involved attentional states, it is particularly problematic if more attention is directed toward the experimenter than the manipulations.

**Conclusion**

I sought to examine how mindfulness and flow function in a negative feedback context. Chen et al. (2012) looked strictly at mindfulness, and the differing outcomes of these two studies suggest that mindfulness and flow may be better suited for different tasks and allow for better coping strategies if one performs poorly on these tasks (Brown & Westbrook, 2005). Flow is associated with a narrow attentional breadth, which may support its superiority over mindfulness in more physical activities. Despite the null results, with further research this area of inquiry may help people in organizational settings become better prepared to use the feedback they are receiving in constructive ways.
References


Measure of:
• State Affect
• Feedback Orientation

Mindfulness Induction

Condition 2 & 4

Flow Manipulation

Condition 3 & 4

Tetris Task 1

Negative Feedback

Measure of:
• Reactions to bogus negative feedback
• Flow
• Interest

Tetris Task 2

Flow Manipulation 2

Condtions
1-Control
2-Mindfulness
3-Flow
4-Mindfulness & Flow

Figure 1. Procedure Overview
Table 1.

Descriptive Statistics for Focal Variables

<table>
<thead>
<tr>
<th>DV</th>
<th>Condition</th>
<th>Mean</th>
<th>SD</th>
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<tbody>
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<td></td>
<td>Mindfulness</td>
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<td></td>
<td>Flow</td>
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<td>Mindfulness + Flow</td>
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<td>Flow Score 2</td>
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<td>Flow</td>
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<td></td>
<td>Mindfulness + Flow</td>
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*Note: N=92. ERPF = Emotional reactions to performance feedback. Tetris scores 1 and 2 underwent logarithmic transformations.*
### APPENDIX

### STATE AFFECT

**Instructions:** This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent *you feel this way RIGHT NOW.*

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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<td>a little</td>
<td>moderately</td>
<td>quite a bit</td>
<td>extremely</td>
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<td>or not at all</td>
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<td></td>
<td>______distressed</td>
<td>______alert</td>
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<td>______excited</td>
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<td>______upset</td>
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<td>______strong</td>
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<td>______scared</td>
<td>______attentive</td>
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<td>______hostile</td>
<td>______jittery</td>
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<td></td>
<td>______proud</td>
<td>______afraid</td>
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(Watson & Clark, 1994)
EMOTIONAL REACTIONS TO PERFORMANCE FEEDBACK

1(definitely feel) to 4 (definitely do not feel), the extent to which five adjectives (jittery, intense, fearful, anxious, and tense) describe your feeling “at this moment.”

(Thayer, 1989)

FEEDBACK ORIENTATION

When completing this measure, please conceptualize feedback as any information about your academic performance that can be used to regulate or improve your future performance—not just grade-based information.

Please indicate your agreement with each of the following items on a scale where 1 = strongly disagree and 5 = strongly agree.

1. Feedback contributes to my success at school.
2. To develop my skills at school, I rely on feedback.
3. Feedback is critical for improving performance.
4. Feedback from instructors can help me advance in school.
5. I find that feedback is critical for reaching my goals.
7. It is my responsibility to apply feedback to improve my performance.
8. I hold myself accountable to respond to feedback appropriately.
9. I don’t feel a sense of closure until I respond to feedback.
10. If my instructor gives me feedback, it is my responsibility to respond to it.
11. I feel obligated to make changes based on feedback.
12. I do not feel accountable for responding to the feedback I receive.
13. I try to be aware of what other people think of me.
14. Using feedback, I am more aware of what people think of me.
15. Feedback helps me manage the impression I make on others.
16. Feedback lets me know how I am perceived by others.
17. I rely on feedback to help me make a good impression.
18. The perceptions others have of me are not important.
19. I feel self-assured when dealing with feedback.
20. Compared to others, I am more competent at handling feedback.
21. I believe that I have the ability to deal with feedback effectively.
22. I feel confident when responding to both positive and negative feedback.
23. I know that I can handle the feedback that I receive.
24. I often feel insecure when receiving feedback.

(Linderbaum & Levy, 2010)

SHORT Dispositional Flow Scale (S DFS)
Please answer the following questions in relation to your experience in your chosen activity. These questions relate to the thoughts and feelings you may experience during participation in your activity. You may experience these characteristics some of the time, all of the time, or none of the time. There are no right or wrong answers. Think about how often you experience each characteristic during your activity, then circle the number that best matches your experience.

In general, when I take part in (name your main activity): 
1 Never 2 Rarely 3 Sometimes 4 Frequently 5 Always

1 I feel I am competent enough to meet the demands of the situation
2 I do things spontaneously and automatically without having to think
3 I have a strong sense of what I want to do
4 I have a good idea about how well I am doing while I am involved in the task/activity
5 I am completely focused on the task at hand
6 I have a feeling of total control over what I am doing
7 I am not worried about what others may be thinking of me
8 The way time passes seems to be different from normal
9 The experience is extremely rewarding

(Jackson, Eklund, and Martin, 2010)
INTEREST

(1 = strongly disagree; 6 = strongly agree)

The subject matter in this study is interesting.

I think what we are doing in this study is boring.

I am enjoying this study very much.

I am really enthusiastic about this study.

PERFORMANCE FEEDBACK

"The average score on this task for Butler University students is scoring in the 50th percentile. Your individual score on this task was in the 25th percentile, well below average"

(adopted from Cianci et al., 2010)

EXPERIMENTAL MANIPULATION

Recorded instructions for each condition will last 5 minutes.

*Focused breathing*

Participants will be told to “focus on the actual sensations of breath entering and leaving the body. There is no need to think about the breath—just experience the sensations of it. When you notice that your awareness is no longer on the breath, gently bring your awareness back to the sensations of breathing.”

(Adapted from Arch & Craske, 2006)